



Prepared for the Welfare Expert Advisory Group

Rapid Evidence Review: The impact of poverty on life course outcomes for children, and the likely effect of increasing the adequacy of welfare benefits

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Executive summary

Scope

This rapid evidence review¹ considers the questions:

1. What is the impact of poverty in childhood on life course outcomes for children?
2. What is the likely effect of increasing the adequacy of welfare benefits on life course outcomes for children?
3. What is the impact of poverty in adulthood on adult wellbeing?

The rapid evidence review focuses on the impact of childhood poverty on life course outcomes and adult poverty on adult outcomes. We are primarily interested in evidence indicating a causal relationship between poverty and outcomes, rather than evidence of association only. The review does not address the complexity of the many interacting factors that may influence a child's development over time. Instead, it concentrates on the impact of poverty using evidence from studies where the designs try to take this complexity into account.

The impact of childhood poverty on life course outcomes

Overall, the evidence base on the causal impact of childhood poverty on life course outcomes is still limited, but it does indicate that:

- Children and adolescents who experience poverty have worse cognitive, social-behavioural and health outcomes, in part because they have lower family incomes and not only because having a lower family income is correlated with other household and parental characteristics.
- The strongest evidence relates to cognitive development and school achievement and the next strongest relates to social and behavioural development.
- Poverty affects multiple outcomes for children at the same time.
- Evidence shows both the lack of ability to purchase resources for children and stress on parents and children resulting from low income are pathways influencing negative outcomes.

¹ The term 'rapid evidence review' is used to reflect the limited timeframe and resource available for the review's conduct and reporting; it is a narrative synthesis rather than systematic review; and it draws heavily on existing reviews with fewer primary studies.

- Evidence of the negative impact of poverty on neurobiological outcomes is building.
- Increases in income have a bigger positive effect on life course outcomes in low-income families compared with higher income families.
- Exposure to poverty across childhood and adolescence influences later outcomes although, on current evidence, there is no consensus about which stage of childhood is most important. From a developmental perspective, the prenatal stage to age 5 has been identified as particularly important.
- There is some evidence that longer-term poverty has a more severe negative effect on children's outcomes than shorter-term experiences of poverty.
- Childhood poverty negatively influences adult employment, education, income, health and cognitive outcomes.
- Information on the size of poverty's impact on outcomes is still limited and varies considerably by study methods.

The likely effect of increasing the adequacy of benefits on children's life course outcomes

- Evidence indicates increases in family income from cash transfers can positively affect outcomes for both children and adults.
- The level of cash transfer needed to make a difference in the New Zealand context cannot be determined from the evidence in this brief review because the evidence about the size of the effects is not well established. And also because all the evidence relates to socio-cultural contexts that differ from New Zealand, in their population profiles, income distributions, mix of public provision, and the incentives / disincentives that might be created.
- More evidence in relation to the New Zealand context would be a useful addition to the evidence base.

The impact of poverty in adulthood on adult wellbeing

- Although the association between adult poverty and adult wellbeing is well established, the evidence of causal impacts is not, except in relation to mental health.
- Assessing the causal impact of poverty in adulthood on adult wellbeing is complex because:
 - people grow into adulthood having been exposed to diverse physical and social environments, having developed a range of capacities based on those exposures and having acquired different levels of resources and assets with which they may be able to withstand financial shocks
 - people's experience of poverty in adulthood may be a continuation of childhood and adolescent exposures, whereas for others it may be relatively new experience
 - people may experience poverty in early, middle or late adulthood with different consequences and trajectories
 - reverse causation needs to be considered where associations of poverty with specific outcomes in adulthood might be due to the outcome causing poverty rather than poverty causing the outcome.

- Increased income in adulthood has been shown to have a positive impact on mental health.
- From a very small evidence base, there are indications that increased income makes a positive impact on domestic abuse.
- Reviewers interpreted the mixed results across several outcomes categories being due to increased income allowing people greater choice of educational institutions and programmes they attend, in their employment options and in whether to stay in or leave relationships.
- Recent research suggests poverty has a negative impact on social relationships.

Introduction

This paper summarises recent literature to answer three questions posed by the Welfare Expert Advisory Group secretariat:

1. What is the impact of poverty in childhood on life course outcomes for children?
2. What is the likely effect of increasing the adequacy of welfare benefits on life course outcomes for children?
3. What is the impact of poverty in adulthood on adult wellbeing looking across domains including physical and mental health, inter-parental relationship quality social connectedness and quality of life?

The paper has been organised into four sections. The:

- first section summarises evidence on the effects of being exposed to poverty in childhood on outcomes in childhood and adolescence
- second section summarises evidence on the effects of being exposed to poverty in childhood on adult outcomes
- third section considers the evidence from the previous two sections for the implications of increasing cash transfers on outcomes for children.
- fourth section summarises evidence on the effects of exposure to poverty in adulthood on adult wellbeing.

Scope

The rapid evidence review focuses on the impact of childhood poverty on life course outcomes and the impact of adult poverty on adult wellbeing. We are primarily interested in evidence indicating a causal relationship between poverty and outcomes, not evidence of association only. Although evidence on causal relationships was prioritised in this review, evidence on causal relationships is not yet comprehensive, hence, the inclusion of a recent review on neurobiological mediators (Kim et al. 2018) that contains several studies reporting associative relationships.

The review does not address the complexity of the many interacting factors that may be influencing a child's development over time. Instead, it concentrates on the impact of poverty using evidence from studies where the designs try to take this complexity into account in making an assessment of the effect of poverty on outcomes.

Given the time and resources available to conduct this review, we focused on recent reviews of the evidence, when those were available, and recent peer reviewed literature and academic working papers for aspects not the subject of recent reviews. It is a narrative review synthesis of the evidence and is not a systematic review.

Key terms

Poverty: Low income and material hardship are commonly used measures of family poverty and both have been used to monitor poverty in New Zealand (Perry 2017).

Studies included in this review have used a range of poverty measures. Cooper & Stewart (2013; 2017) used financial resources at a household level as their focus was on whether money affected children's outcomes. They reviewed studies that used household income; specific components of income such as benefits or wages; household expenditure; household wealth and assets; or subjective perceptions of the household's financial situation.

Other reviews such as Kim et al. (2018) focused more broadly on socio-economic disadvantage. Kim et al.'s review included studies using measures of poverty such as family income and material hardship but also studies using measures of socio-economic position such as parental occupational status or parental education. Although Kim et al.'s (2018) scope is more inclusive in relation to exposure measures, they incorporate a range of studies directly relevant to the question of poverty's impact on children's life course outcomes.

Studies using measures of area or neighbourhood deprivation as the main exposure variable are not considered in this review, except for several studies reviewed by Kim et al. (2018) in relation to the effects of adult socio-economic disadvantage on adult physiological outcomes.

Life course: Alwin (2012) notes that the term 'life course' is used to refer to a range of concepts. In this literature summary, it was taken to mean the earlier life influences on later (child, adolescent and adult) outcomes including the likelihood of life events, transitions and trajectories across the life-span. It is close to the definition described by Kuh et al. (2003) for life course epidemiology – 'the study of long term effects on later health or disease risk of physical or social exposures during gestation, childhood, adolescence, young adulthood and later adult life'. However, this review considers the effects of poverty (as the exposure) in relation to a broad range of biological, psychological, behavioural and social outcomes, not only health or disease outcomes.

Longitudinal studies in New Zealand: There are four major longitudinal studies following cohorts of children born in New Zealand. The Dunedin Multidisciplinary Health and Development Study began in 1972-3 with a cohort of 1037 children. The Christchurch Health and Development Study started mid-1977 with a cohort of 1265 children. Evidence from these two studies is cited in this report. More recently the Pacific Islands Family Study started in 2000 with a cohort of 1398 Pacific children. The Growing Up in New Zealand study is the largest study, following a cohort of 6846 children, from before the child's birth in 2009-10. These studies may provide evidence on the effects of poverty on outcomes within contemporary New Zealand cohort's in the future.

Conceptual frameworks describing how poverty leads to poor life course outcomes

Several conceptual frameworks describe how poverty can lead to poor life course outcomes for children. These theories emphasise the importance of the physical, social and food/nutrition environments within which children live and grow. They indicate how these environments affect children's development in fundamental ways, including children's biological structure and function, cognitive function, social and emotional function and behaviour. Stimulation from different environments may support positive developmental outcomes or negatively affect children's developmental outcomes.

One theory is the **resource and investment model** in which income enables parents to buy goods, services and opportunities for their children that support their positive development (Boston & Chapple 2014; Duncan et al. 2017). For example, money can buy higher quality housing in safer neighbourhoods with better schools, more nutritious foods, a range of stimulating learning opportunities within and outside of schools, and allow parents to spend more time with their children.

The **family stress model** contends that poverty increases parental stress, parental depression and relationship conflict which in turn influences parenting behaviours (including parenting practices, style and attachment) as well as parental mental health (eg Cooper & Stewart 2013; Gershoff et al. 2007; Mayer 2002). More recently, several researchers have posited that poverty affects the cognitive functioning of adults and their decision-making. Poverty places greater demands on adult cognitive functions, which are a limited resource, thereby negatively affecting adults' (parents') decision-making abilities in stressful circumstances, which in turn may affect their children (Duncan et al. 2017; Mani et al. 2013; Schilbach et al. 2016).

Neural and biological stress pathways are one of the pathways through which the effects of poverty are embedded at neural and biological levels in children and adults (eg Evans 2016; Kim et al. 2018; Miller et al. 2011; Pascoe et al. 2016). Stress from a range of negative environmental conditions has detrimental impacts on children's development (eg Evans & Kim 2013; Duncan et al. 2017). Blair & Raver (2016, p.31) noted that, in the past, research on *"child development in the context of poverty has focused on reduced stimulation and reduced opportunity for learning relative to children in higher-income homes. Increasingly, however, research in a variety of disciplines is converging on the idea that in addition to reduced opportunity for types of stimulation that positively affect development, such as a rich and varied language environment, poverty is also characterized by an overabundance of types of stimulation that negatively affect development"*.

Poverty-related stressors have been shown to affect physiological responses and brain development and function, including those related to the development of executive function (Blair & Raver 2016). Executive function is essential for self-regulation and underpins early cognitive and social competence (Blair & Raver 2016) with important repercussions for life course outcomes (eg Moffitt et al. 2013).

Responsive relationships and health-promoting environments early in a child's life provide a strong foundation for a lifetime of effective learning, adaptive behaviour and good health (Shonkoff 2016). However, chronic stress without the *"buffering protection of supportive caregiving can produce patterns of adaptation and physiological disruptions that become embedded biologically and increase risk for multiple impairments"* (Shonkoff 2016, p 1003).

In addition, to the social environment, aspects of the **physical environment**, such as noise, crowding, substandard housing quality, and the presence of toxic substances have also been identified as strong mediators between socio-economic disadvantage and neurobiological outcomes across the lifespan (Kim et al. 2018).

Another perspective is that both poverty and the level of **income inequality** in a society (the economic distance between people) lead to poor outcomes. Pickett & Wilkinson (2015) contend that wider income differences in society lead to worse health outcomes. Social processes such as status, prestige, control, access, cohesion and collective efficacy and behaviour in social hierarchies are seen as mediating the effect of income inequality on outcomes (eg Kawachi et al. 2010; Yoshikawa et al. 2012).

Figure 1 details the relationships between poverty and a range of outcomes in the Resource and Investment model and the Family Stress model. These models represent the main elements of the theories but do not incorporate the complexity of the relationship between family financial resources and children's life course outcomes. For illustrative purposes, Appendix 1 details two additional models which illustrate the wider set of relationships and mechanisms which influence outcomes (Yoshikawa et al. 2012; Tobias & Mason 2010).

The timing, intensity, accumulation and sequencing of physical or social exposures influences children's development and outcomes over time.

There are several ways of thinking how physical or social exposures operate to influence outcomes over time. Within health models, the timing, accumulation and sequencing of exposures have been emphasised (eg Lynch & Smith 2005; Kim et al. 2018; Power et al. 2013). The life course approach distinguishes exposures during:

- **critical periods of development** that affect the structure or function of organs, tissues or body systems which in turn affect later disease risk
- **sensitive periods of development**, where (similar to critical periods) exposures are seen as exerting their greatest effects during times of rapid development.

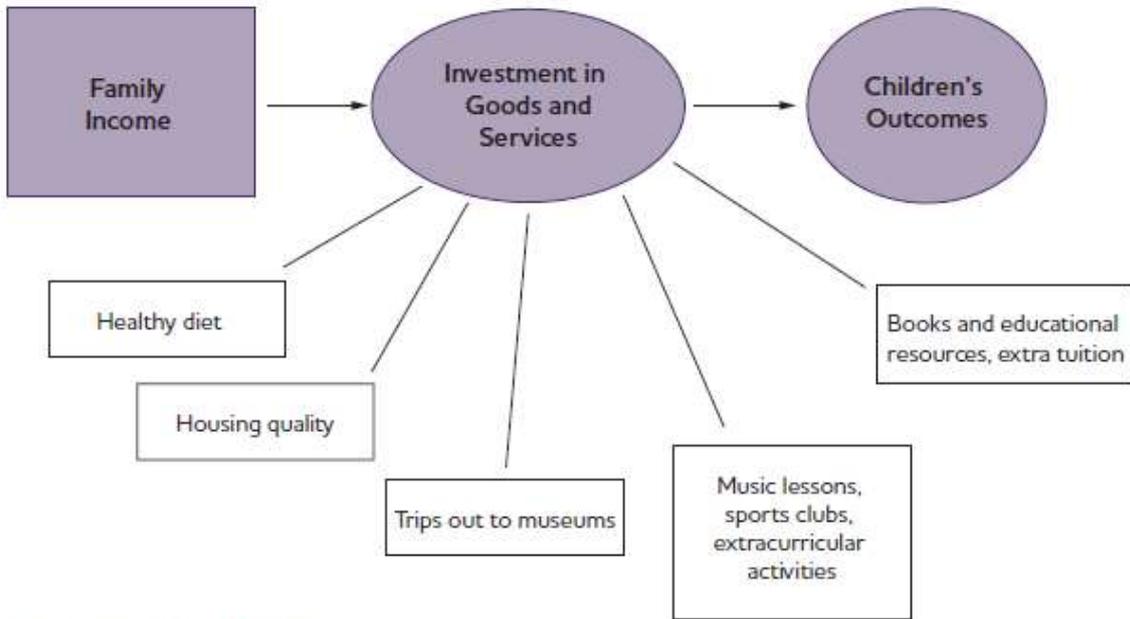
Within the life course approach:

- **accumulation of risk models** focus on the number, duration or severity of damaging environmental, socioeconomic, and behavioural factors with risk of poor outcomes accumulating as these increase.
- **chains of risk models (pathways)** emphasise the sequence of events or exposures where exposure to an adverse event raises the risk of exposure to another. Social, biological and psychological factors can be part of chains of risk models.

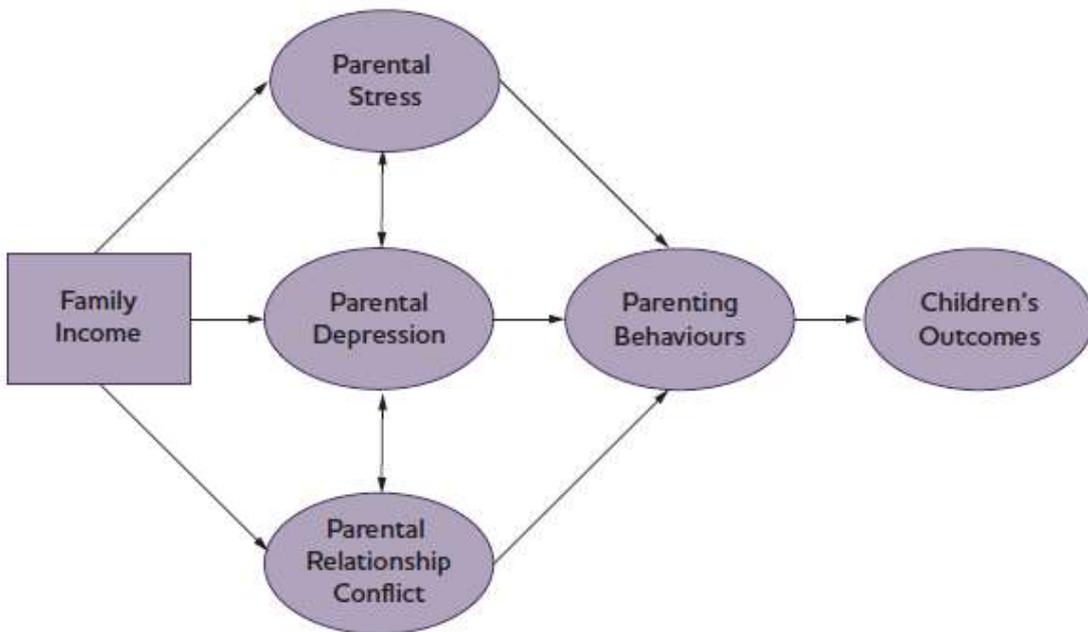
Although these have been developed within a health framework for health outcomes, they are applicable to a range of life course outcomes (eg cognitive, educational, social-emotional, behavioural and economic).

Figure 1: The Resource and Investment Model and the Family Stress Model (Cooper & Stewart 2013 p.40)

The Investment Model



The Family Stress Model



Section One: Evidence of the impact of poverty on children's life course outcomes

It is well known from national and international literature that family poverty, whether measured as low income or material hardship, is strongly associated with poorer outcomes for children's wellbeing and healthy development (Boden, Fergusson, & John Horwood, 2013; Cooper & Stewart, 2013; Dickerson & Popli, 2012; Duncan, Morris, & Rodrigues, 2011; Duncan, Ziol-Guest, & Kalil, 2010; Gershoff, Raver, Aber, & Lennon, 2007; Mayer, 2002; Poulton & Ramrakha, 2012; Poulton et al., 2002).

A key debate is whether results of studies show causal impacts. One recent review (and its updated version) has considered the impact of household financial resources in childhood on child and adolescent outcomes (Cooper & Stewart 2013; 2017) from a causal perspective.

These authors did not include studies that considered the impact of household financial resources in childhood on adult outcomes. However, they have reviewed studies investigating the impact of an adult's individual or household resources on other outcomes in adulthood (Cooper & Stewart 2015) which is referred to in Section Four.

Another recent review considered the biological and neurological impact of socio-economic disadvantage and its influence on health development across the lifespan (Kim et al. 2018). We did not find any recent reviews of the effects of childhood poverty on adult outcomes other than health.

Causal relationships between poverty and outcomes are difficult to establish but some studies provide more robust evidence of impact.

Causal impact is difficult to establish in social sciences and debate continues about which types of methods are sufficiently robust for conclusions to be drawn about causal relationships.² Some study designs leave room for doubt about whether results can be interpreted as due to differences in family income or due to other differences associated with families having lower or higher incomes.

Cooper and Stewart's reviews (2013; 2017) of the impact of household financial resources on child and adolescent outcomes used studies they considered sufficiently robust for causal interpretation. The 61 studies included randomised control trials (6), natural experiments or other externally determined income changes (eg instrumental variable approach) (33), and longitudinal observational (eg fixed effect) approaches (22). They restricted their review to these methods because they were more likely to indicate that differences in outcomes were due to differences in household financial resources and not just because household financial resources were correlated with other household and parental characteristics.

Internationally, the evidence base addressing the question of causal impacts is comparatively small and coverage of the full range of outcomes across age-different groups is still limited internationally. This limits our ability to draw fine grained conclusions from the literature.

² A review of appropriate research designs is beyond the scope of this review. Interested readers are referred for example to Shadish et al. (2002) and recent debates in the epidemiological literature (eg Broadbent et al. 2017).

Evidence: the impact of childhood poverty on child and adolescent development and outcomes

Empirical evidence suggests there is a causal relationship between poverty and a range of childhood and adolescent outcomes, starting from the prenatal period of a child's life. This section summarises Cooper & Stewart's (2013; 2017) review of 61 studies investigating the causal effects of household financial resources on children and adolescent outcomes. It also summarises evidence from reviews of the impact of socio-economic disadvantage on physical and psychological health development and from several more recent studies on the impact of poverty on outcomes not included in the Cooper & Stewart reviews.

Overall, the main outcomes that Cooper & Stewart reviewed for causal effects within childhood and adolescence are:

- cognitive and educational outcomes
- social-emotional and behavioural outcomes
- health outcomes
- child abuse and neglect outcomes
- mediators relating to the Resource and Investment model and the Family Stress model.

The strength of the evidence and the coverage of outcomes and mediators varied across these broad outcome categories, which are considered below in more detail. Table 1 summarises Cooper & Stewart's (2017) results by outcome and Table 2 summarises their results by study type. Although Cooper & Stewart (2013 p.9) took steps to reduce potential sources of bias in their review, they acknowledge that publication bias remains in that studies identifying significant results are more likely to be published.

Table 1: Summary of results reviewed by Cooper & Stewart (2017) by outcomes (N=87)^b

Studies measuring	Negative results	No effect	Positive results	Mixed ^a results	Total
Child cognitive development and school achievement	1	5	24	0	30
Social, behavioural and emotional development	0	4	12	0	16
Physical health	0	3	13	1	17
Potential mechanisms					
Parenting/home environment		1	5		6
Maternal mental health		1	6		7
Maternal health behaviours		3	6		9
Food sufficiency	1		4		4
Expenditure			2	1	4

Source: Cooper & Stewart (2017 p.12)

a For studies with multiple outcome measures, 'Mixed' indicates a mix of positive and negative results within the outcome category.

b Note that the number of studies included in the review is 61 while the number of outcomes investigated across studies is 87.

Table 2: Summary of results reviewed by Cooper & Stewart (2017) by study type

Type of study	Negative results	No effect	Positive results	Not all results signif. ^a	Total
Randomised control trials		1	4	1	6
Quasi-experiments	1	3	23	6	33
Observational studies		1	18	3	22
Total	1	5	45	10	61

Source: Cooper & Stewart (2017)

a This category indicates a mix of positive and non-significant results on some but not all types of outcome (eg positive effects on educational outcomes but not on health).

Children's cognitive and educational outcomes are affected by poverty

Thirty of the 61 studies reviewed by Cooper & Stewart (2017) examined the impact of household financial resources on children's cognitive and educational outcomes including four randomised control trials and 15 quasi-experimental studies. Twenty-four of the 30 studies found higher household financial resources had positive effects on a range of cognitive and/or educational outcomes for children.

Household financial resources were found to affect children's engagement and attendance in education, scores they obtained on a variety of tests, the educational transitional options available to them at a later age, and their decision-making processes at key educational transition points (Cooper & Stewart 2017 p.13). A number of studies also found a non-linear relationship between low family income and cognitive and educational outcomes. That is, changes in income made the most difference in outcomes for those at the lower end of the income distribution.

Cooper & Stewart (2017) suggest that one reason some studies in their review found no impact on outcomes was due to the nature of the income change for families. For example, studies examining the effects of lottery wins were less likely to find effects compared with changes in income resulting from shifts in wages or from social security benefits. Another reason they suggest may have been due to the methods researchers used. For example, some studies averaged effects across the whole study population, rather than considering effects across the income distribution. Averaging across the whole population potentially dilutes the effects which (as indicated in other studies) were more likely to be found for those at the lower end of the income distribution.

More recent studies add to the evidence of the impact of family income on cognitive and educational outcomes including across childhood and into early adulthood. Duncan et al.'s (2017) review of USA evidence indicates that increases in family income lead to increased school achievement in middle childhood and to greater educational attainment in adolescence and early adulthood. A recent study by Bastian & Michelmore (2018) using four decades of Earned Income Tax Credit (EITC) (USA) data suggests that increases in EITC exposure during adolescence (ages 13 to 18 years) increases the likelihood of high school graduation, college graduation, and employment in adulthood.

Hair et al. (2015) investigated the negative effects of poverty (low family income) on the neurobiology of children and its association with educational outcomes. They found that children from low-income backgrounds score "lower on standardized tests of

achievement and 15% to 20% of that developmental difference might be attributed to the deleterious effects of limited family resources on relative brain development. [The authors] found the influence of [poverty] on children's anatomical brain development was concentrated among children from the poorest households. No statistically significant differences were found when comparing near poor children with children from higher SES [socio-economic status] groups." (p.827)

Children's social, emotional and behavioural outcomes are affected by poverty

Sixteen of the 61 studies reviewed by Cooper & Stewart (2017) investigated the effects of household financial resources on children or young peoples' social-emotional and behavioural outcomes. This included two RCTs, seven quasi-experimental and seven observational studies.

Outcomes investigated included behavioural problems measured by the Strengths and Difficulties questionnaire, internalising and externalising behaviours³, crime, and psychiatric symptoms. Results from 12 of the 16 studies indicated income had an impact on at least some of socio-emotional and behavioural outcome measures included in the 12 studies.

Similar to the results for cognitive and educational outcomes, a non-linear relationship between family income and the outcomes was found. That is, changes in family income at the lower end of the income distribution show a larger impact on the children's / adolescent's social-emotional and behavioural outcomes.

Several recently published studies using longitudinal data also support these findings. Using a longitudinal quasi-experimental approach and difference in differences methodology, Akee et al. (2018) found that an unconditional household income transfer had a beneficial effect on children's emotional and behavioural health and personality traits during adolescence. The effect was most significant for children who initially exhibited more emotional or behavioural disorders.

Recent observational studies found that the timing and persistence of poverty increased the likelihood of negative outcomes. For example, Mazza et al. (2017) using longitudinal data from Canada found that early and prolonged exposure to childhood poverty (defined by Canadian thresholds) predicted higher levels of behavioural problems in early adolescence. Fitzsimons et al. (2017), using the UK Millennium Cohort study data investigated the role of temporary and persistent poverty and temporary and persistent mental health problems of mothers and fathers for children aged 5 and 11. They found that both persistent levels of poverty and transitions into poverty are strongly associated with levels of and transitions into childhood mental health problems with somewhat stronger effects for persistent poverty. Similarly, Noonan et al. (2018) investigated the relationship between family income and child socio-emotional behaviour at 11 years of age, and examined the mediating role of maternal psychological distress over time using the UK Millennium Cohort Study. Increased permanent family income was protective against behavioural problems at age 11. Gariepy et al. (2017), using longitudinal data from the USA Panel Study of Income Dynamics (with marginal structural modelling), found that both the timing and the duration of low family income in childhood predicts individual differences in adolescent (aged 12 to 19 years) subjective wellbeing. Each

³ Internalising problems in children involve inward-directed reactions and experiences of distress for example, sadness, depression, worry or anxiety. Externalising problems in children involve outward directed reactions including under-controlled acting out behaviours, for example, conduct difficulties, hyperactivity and impulsivity.

year in poverty increased the likelihood of lower subjective wellbeing. Low family income, when children were aged 0 to 2 years, was particularly sensitive to later subjective wellbeing.

Children's health outcomes and neurobiological mediators of health are affected by poverty

Seventeen of the 61 studies reviewed by Cooper & Stewart (2017) investigated the impact of household financial resources on children's physical health, although the range of outcomes investigated in these studies was relatively limited. Two studies were observational and 15 were quasi-experimental.

Thirteen of the 17 studies found household financial resources affected children's physical health. Across the studies birth weight and other neonatal outcomes, height for age, obesity/body mass index, respiratory conditions and general health were the main outcomes investigated. Several studies showed effects in relation to birthweight and other neonatal outcomes, height for age and general health. Effects for obesity and respiratory conditions were mixed, with some studies indicating effects while other studies did not.

Two recent health-focused reviews indicate a wider effect of poverty on health outcomes through neurobiological and other mediators (Kim et al. 2018; Pascoe et al. 2016). Kim et al. (2018) reviewed the effects of exposure to socio-economic disadvantage during childhood on the structure and functioning of children's and adult's brains as well as the functioning of physiological pathways. Evidence suggests that socio-economic disadvantage (based on measures of income, occupation and education level of parents) can disrupt or delay neurobiological development that underlies optimal cognitive and emotional functioning during childhood. That is, children's brain structure and functioning is affected by socio-economic disadvantage which influences children's development. Evidence also suggests that children's physiological systems are affected including: the sympathetic nervous system's baseline levels, reactivity and recovery; changes in the hypothalamus-pituitary-axis resulting in elevated baseline cortisol and elevated reactivity; changes in the metabolic system that result in increased adiposity; elevated inflammatory system levels; and higher levels of allostatic load. These changes have more immediate consequences for children's development but also affect adult health outcomes.

Both the timing and duration of exposure to socio-economic disadvantage may affect neurobiological systems. Early exposure and continuous exposure may increase vulnerability to disease across the lifespan. However, changes in brain structure and function in response to socio-economic disadvantage may occur across childhood through to late adolescence. Kim et al. (2018) note that more studies are needed to establish the temporal and causal relationships.

An area of increasing research relates to the effect of income inequality on children's outcomes. Odgers (2015) reviewed the evidence in relation to the effects of how economic distance between low-income children and their peers within countries, neighbourhoods and schools may influence outcomes. Results within and across studies differed by age group and gender. In the Moving to Opportunity study in the USA, families were randomly assigned vouchers to move out of high poverty neighbourhoods. Results were mixed; compared with the control group, boys suffered higher rates of mental health problems and anti-social behaviour whereas girls had lower rates of depression and conduct disorder. Positive impacts on physical health and wellbeing were found. Positive effects on the children's earnings as adults were found for children who

moved when they were aged 12 years or younger. But there was no effect or a slightly negative effect on adult earnings for children who were aged between 13 and 18 years when they moved. Similar results were found in two longitudinal studies in the UK.

Poverty influences the mechanisms or mediating factors hypothesised in the Resource and Investment model and the Family Stress model

Cooper & Stewart (2017) reviewed studies investigating the effect of household financial resources on potential mechanisms within the Resource and Investment and Family Stress models (but not the neurobiological embedding of the stress pathways). Twenty-four studies investigated a range of outcomes including parenting behaviours and the home environment, maternal mental health, maternal physical health and health behaviours, domestic violence, food insufficiency, and expenditure.

Results from four studies relating to the Resource and Investment model (expenditure patterns) are mixed and the authors state that it is difficult to draw firm conclusions about the effects of increased income on parents' spending patterns. Studies investigating expenditure patterns in relation to increases in income from 'child benefits' (in the UK and Germany) showed positive effects on parental spending patterns such as increased spending on fruit and vegetables and on food expenditure as well as more spending on children's clothes, books, toys and trips outside the home. The authors speculated that the labelling of the money as a 'child benefit' or 'child tax credits' may have encouraged parents to spend the income on child-related goods.

Results from eight studies investigating mechanisms relating to the Family Stress model were positive although not all measures within every study were significant. In general, the results show that poverty affects:

- parenting and HOME⁴ environment scores (including for example cognitive stimulation in the home, learning materials and activities, parental warmth and responsiveness)
- maternal mental health
- domestic abuse
- selected maternal health behaviours
- parental supervision
- number of activities undertaken with the mother
- number of parental arrests.

Four studies investigating food insufficiency showed that increased income led to decreases in food insufficiency. Overall, evidence on the effects of poverty on maternal depression and food insufficiency is the strongest (Cooper & Stewart 2017, p.19).

Several recent observational studies provide additional support for the Family Stress model. Kaiser et al. (2017) found that parenting styles (such as psychological control) as well as mothers' life satisfaction partially mediate the relationship between poverty and child behavioural outcomes. A longitudinal study by Luby et al. (2013) found that poverty in early childhood negatively impacts brain development at school age and that some of the association was mediated by caregiving support/hostility as well as stressful life events.

Similar to other child outcomes described above, income was found to have a non-linear effect on outcomes. Six out of seven studies that tested whether the effect was greater

⁴ HOME refers to the Home Observation Measurement of the Environment which is a measure of the quality of a child's home environment.

for lower income families found the effects were larger or only significant for less advantaged families (Cooper & Stewart 2017, p.20).

Child abuse and neglect outcomes - little evidence is available on causal impact

Recent reviews indicate that poverty and low income are strongly associated with child abuse and neglect and the severity of maltreatment (Slack et al. 2017; Bywaters et al. 2016) but few studies have convincingly investigated the causal relationship.

Cancian et al. (2013) reported the results of a random assignment experiment which varied the amount of child support payments participants received for non-marital children who participated in the 'Temporary Assistance for Needy Families program'. The results indicated that receipt of full child support compared with partial child support reduced the risk of child welfare involvement.

Several more recent studies also suggest that there may be a causal relationship between poverty and child neglect (Berger et al. 2017; Brown & De Cao 2017; Raissian & Bullinger 2017). Berger et al. (2017) used an instrumental variables approach which uses variation between states and over time in amounts of total state and federal earned income tax credit. Results suggest that an exogenous increase in income from the Earned Income Tax Credit is associated with reductions in child neglect and Child Protection Service involvement, particularly among low-income single-mother families. Similarly, Raissian & Bullinger (2017) found that increases in a state's minimum wage led to a decline in overall child maltreatment reports, particularly neglect reports. The decline was concentrated among young children (0-5 years of age) and children aged between 6 and 12 years, but it was not significant for adolescents.

Brown & De Cao (2017) investigated the effect of unemployment on the number of reported cases of child abuse and neglect in the USA from 2004 to 2012. Results suggest that unemployment leads to an increase in child neglect due to parents more limited access to the resources they need to address their children's basic needs, for example clothing, food and medical care. Results did not show a relationship between unemployment and other forms of child abuse. The research also considered whether access to government and private safety nets had mitigating effects. In states that were more generous, offering 87 weeks of unemployment benefits or more, child neglect increased by 14% but in states that offered a maximum of 55 weeks of benefits, reported incidents of child neglect rose by 21%.

Information on the size of poverty's impact on outcomes is still limited and varies by study methods

To compare across studies, Cooper & Stewart (2013; 2017) calculated standardised effect sizes where studies had sufficient information available, although they note a number of technical caveats to their calculations.⁵ Their calculated effect sizes represent the standard deviation change linked to USD\$1,000 in the year 2000 prices. The effect sizes vary considerably across outcome measures and methodologies with longitudinal fixed effects studies (or similar approaches) having much smaller effect sizes than experimental designs. The authors note that a larger body of evidence, particularly of

⁵ These caveats include the variation in approach taken to equalisation of household income across studies, the inability to adjust for differences in average incomes, and restricted ability to differentiate effect sizes for different groups within the population studied. These caveats suggest that the comparability of effect sizes is not exact.

experimental studies, would be valuable to create more confidence in the standardised effect size estimates.

For **cognitive and educational outcomes**, Cooper & Stewart (2013; 2017) calculated effect sizes for 21 outcomes (obtained from 12 of the 30 studies reporting on cognitive and educational outcomes). As noted above, effect sizes varied considerably according to methods used. US\$1000 led to 1 to 2 percent improvements in cognitive outcomes in fixed effects studies compared with effect sizes of between 5 to 27 percent improvements for experimental and quasi-experimental studies.

A similar range of effect sizes was obtained for 15 **social and behavioural outcomes** obtained from seven of the 16 studies reporting on these types of outcomes. US\$1000 led to 1 to 3 percent improvements in social and behavioural outcomes for fixed effects studies compared with effect sizes of between 3 to 22 percent improvements for the experimental and quasi-experimental studies (Cooper & Stewart 2017).

Effect sizes for **child health** outcomes (included in five studies) ranged from 1 to 24 percent. Effect sizes for mediators of children's outcomes such as maternal depression and the home environment ranged 1 to 20 percent.

Cooper & Stewart (2013) compared their review results with those of meta-analyses of early intervention effect sizes and concluded that their calculations suggest "*income increases have effect sizes comparable to those identified for spending on early childhood programmes or education, but income influences many different outcomes at the same time.*" (p7)

However, caution should be used in applying these effect sizes to the New Zealand context for several reasons. The effect sizes vary widely within and across jurisdictions as well as by study methods. In addition, the sources of variation in financial resources and the socio-cultural context in which they were determined, differ from New Zealand. The coverage of the age ranges of the children or adolescents exposed to poverty and the outcomes measured are still limited.

That is, although the evidence indicates there are causal effects between household financial resources and children's life course outcomes, the evidence is not sufficient to apply the effect size estimates in the New Zealand context, as the effect sizes will be influenced by contextual mitigating or exacerbating factors. For example from a socio-cultural context perspective, the effect size may vary depending on whether families have access to affordable childcare, early childhood education, health care services, nutritious food or good quality housing (eg Butcher 2017; Cooper & Stewart 2017).

Timing, duration and severity of poverty is related to the level and type of impact on children's life course outcomes

Within reviews, there is a range of evidence and conclusions about the effect of timing, duration and severity of childhood poverty on outcomes (Cohen et al. 2010; Cooper & Stewart 2013; Cooper & Stewart 2017; Duncan et al. 2017; Kim et al. 2018; Pascoe et al. 2016).

Cooper & Stewart (2013) note that there is currently no consensus about which stage of childhood is most important. In the field of health, Cohen et al. (2010) state that early childhood exposures seem to be a potent predictors of a range of health outcomes, while exposure in later childhood and adolescent exposures are risks for other health outcomes.

From a developmental perspective, the prenatal stage to age five has been identified as the most important. Research has shown that brain development in the first years of life lays the foundation for language development, literacy acquisition, cognitive processes, emotional development, self-regulation and problem-solving skills and has a lasting impact on health, future learning and life success (Shonkoff et al. 2012; Shonkoff 2016). Shonkoff (2016) concludes from reviews of extensive research that *"(1) early experiences affect lifelong health, not just learning (2) healthy brain development requires protection from toxic stress, not just enrichment; (3) achieving breakthrough outcomes for young children facing adversity requires supporting the adults who care for them to transform their own lives; and (4) more effective interventions are needed in the prenatal period and first 3 years after birth for the most disadvantaged children and families."*

Evidence cited above indicates that the greater the duration (accumulation) of poverty the larger the impact on outcomes. Similarly, reviews showed there are likely to be non-linear effects, where changes in income at the lower end of the income distribution make the most difference.

Summary: Impact of childhood poverty on child and adolescent outcomes

Evidence suggests that poverty increases the likelihood of exposure to negative developmental influences and reduces the likelihood of exposure to positive developmental influences.

Cooper & Stewart (2017) conclude from their review that the "money makes a difference" to children's outcomes. They state that the evidence shows low-income children have worse cognitive, social-behavioural and health outcomes, in part because they have lower family incomes, and not only because having lower family incomes is correlated with other household and parental characteristics.

- The strongest evidence relates to cognitive development and school achievement and the next strongest relates to social and behavioural development.
- The evidence indicates that income effects are non-linear, that is, a marginal increase in income has a bigger effect in low-income compared with higher-income families.
- More recent evidence supports the relationship of lower family income with intermediate outcomes (mediators, pathways) expected in both the Resource and Investment and Family Stress models. In particular, lower household financial resources are related to increased likelihood of maternal depression.
- Evidence shows exposure to poverty across childhood and adolescence influences later outcomes, although, on current evidence, there is no consensus about which stage of childhood is most important. From a developmental perspective, the prenatal stage to age five has been identified as particularly important.
- There is some evidence that longer-term poverty has a more severe negative effect on children's outcomes than shorter-term experiences of poverty.
- Poverty affects multiple outcomes for children, potentially at the same time.

Section Two: Evidence that childhood poverty impacts on adult outcomes

Although many studies show an association between childhood poverty and adult outcomes, there is some disagreement about whether childhood poverty determines outcomes in adulthood (eg Caspi et al. 2016). No comprehensive evidence reviews addressing this question were found. However, there is increasing evidence from a range of studies about the long-term effects of childhood poverty on adult outcomes.

Overall, the evidence suggests that adult education, employment and income are linked with childhood poverty as well as health and cognitive function. From the evidence reviewed in the previous section, it is probable that the level of that effect will depend on the timing, accumulation and sequencing of exposure to poverty in childhood and adolescence and interaction with other childhood risk factors (eg Duncan et al. 2012; Evans & Kim 2013).

In this section, evidence from three New Zealand studies is outlined first, followed by international studies.

Adult employment, education and income are all linked to the experience of poverty in childhood

Three New Zealand papers using the Christchurch longitudinal survey data investigated the effects of family income in childhood on adult outcomes (Maloney 2004; Gibb et al. 2012; Boden et al. 2013).

- Maloney (2004) found that those living in families with higher incomes in childhood⁶ were significantly less likely to experience economic inactivity, early parenthood and criminal activity, and to enter adulthood without a school or post-school qualification, at age 21. Childhood family income had similar-sized effects on economic inactivity, early parenthood and leaving education without a formal qualification. Inclusion of mediating factors⁷ indicated that some of the effects of family income operate through various indirect pathways. The results in relation to these mediating factors (intelligence tests and conduct problems) align with results cited earlier in this paper indicating that poverty influences cognitive, social and emotional development in childhood.
- Gibb et al. (2012) investigated the effects of childhood family income on life outcomes at age 30. Childhood family income remained significantly associated with educational achievement and economic circumstances after covariate adjustment. The authors concluded that their findings suggest that, *“after due allowance has been made for social, family and individual contextual factors, low family income during childhood is associated with a range of educational and economic disadvantages in adulthood but is not directly related to increased risks of crime, mental health problems or teen pregnancy”*. Similar to Maloney (2004), links were found with educational disadvantage and economic disadvantage. This is consistent with the international evidence reviewed in the previous section indicating that childhood poverty affects cognitive and educational attainment.

⁶ Up to 14 years of age.

⁷ The mediating factors were average Revised Wechsler Intelligence Test scores at eight and nine years of age and average scores on conduct problem assessments by parents and teachers measured at seven, nine, 11 and 13 years of age.

- Boden et al. (2013) investigated pathways to economic outcomes (income and economic living standards) at age 30. They found that the cohort had considerable economic inequality at age 30 even though the cohort itself was relatively advantaged. Childhood living standards influenced both income and economic living standards at age 30, even after adjusting for a range of childhood and adult factors.

Similar findings have been found internationally. Using the Panel Study of Income Dynamics in the USA, Duncan et al. (2010) assessed the impact of exposure to poverty from before birth to the age of five on several adult outcomes. They found a significant and, in some cases large, effect of early poverty on adult earnings and work hours. Duncan et al. (2012) extended the analysis to assess the importance of timing of exposure to poverty and found that, for adult earnings, early income (prenatal to age five years) appears to matter much more than income later in childhood and adolescence. However, poverty in early childhood as well as poverty in adolescence was important for years of completed schooling. In contrast, measures of behavioural outcomes such as arrests in adulthood were largely associated with poverty in adolescence.

Other studies also indicate that increased family income during adolescence has positive benefits. Bastian & Michelmore (2018), in the USA, analysed the effects of Earned Income Tax Credit receipt on education, employment and earnings of the families' children when they reached adulthood. These authors found positive effects on educational attainment and employment in adulthood. They found that increases in Earned Income Tax Credit between the ages 13 and 18 led to increases in high school and college graduation, as well as employment in adulthood. The largest effects were found among individuals from the lowest-income households.

Ratcliffe & Kalish (2017) conducted a trajectory analysis of data from the Panel Study of Income Dynamics with children born in the USA from the late 1960s to the mid-1980s. A group of children who had been persistently poor were categorised, as young adults, into three levels of economic success based on their connection with work or school and level of poverty. Both family and neighbourhood factors were related to success in young adulthood among those persistently poor as children. Important factors were being poor at a very young age, the number of years in poverty, the years in an employed family, the years in a family headed by someone with a disability, and living in disadvantaged neighbourhoods and segregated cities with segregated schools.

These findings from the USA are consistent with those summarised by HM Government (2014) in the UK. This review identified educational attainment, parental qualifications, childhood poverty, and the home learning environment as factors making some poor children more likely to become poor adults. School achievement and overall educational attainment comprise one of several significant mechanisms through which childhood poverty leads to poor outcomes in adulthood including adult poverty.

Mood (2017) investigated the relationship of parental income and social class with children's earnings as adults, using data from Sweden. Results indicate that both parental income and social class have independent associations with their child's later earnings. They capture somewhat different underlying advantages and transmission mechanisms. However, there is overlap in the measures as when only one of the measures is used intergenerational persistence is under-estimated by around 25%.

A recent analysis suggests that childhood poverty may have broader implications for civic participation. Akee et al.'s (2018) analysis of a longitudinal study in the USA found that household receipt of unconditional cash transfers increased the voter turnout of the children in adulthood, particularly among the children from initially poorer households. The income transfers did not have an effect on adult-aged recipients' (the household parents') voting behaviour.

Aizer et al. (2016) investigated the long term impacts of a programme (Mother's Pension Program) that provided cash assistance for up to three years to poor families on the children's longevity, educational attainment, nutritional status, and income in adulthood. Due to the data source availability, the study was restricted to men. The children of applicants accepted onto the programme were compared with the children of rejected applicants.⁸ It found on average that men who received the transfer as children, lived about one year longer, were less likely to be under-weight (not malnourished), had slightly more years of education, and had higher earnings in early adulthood. Butcher (2017) notes that this provides some of the first evidence that purely cash transfers have important long-term outcomes for children.

Adult health and cognitive function are linked to childhood poverty

Evidence indicates that childhood socio-economic disadvantage is prospectively linked to adult physical morbidity and mortality (Melchior et al. 2007; Miller et al. 2011; Power et al. 2013). However the processes mediating the link are multifactorial and disentangling effects is challenging.

As noted above, Kim et al.'s (2018) review showed socio-economic disadvantage in childhood can disrupt or delay neurobiological development that underlies optimal cognitive and emotional functioning during childhood. But childhood exposure to poverty is also associated with a range of brain structural and functional changes and with physiological changes in adulthood. These types of changes are linked with negative health outcomes. Similarly, Cohen et al.'s (2010) review notes that early childhood exposures seem to be potent predictors of a range of health outcomes, while later childhood and adolescent exposures are risks for other health outcomes.

Poulton et al. (2002) investigated the relationship of socio-economic disadvantage during childhood (measured by parental occupation) with health risk factors in adulthood (age 26 years). Compared with children from higher socio-economic circumstances, children who grew up in lower socio-economic circumstances had poorer cardiovascular and dental health as adults.

Evans (2016) investigated the effects of childhood poverty (low-income families) on adult physiological and psychological wellbeing using a prospective, longitudinal design. Results showed that adults (24 years of age) from low-income families show more allostatic load (an index of chronic physiological stress), higher levels of externalising behaviours such as aggression, and more helplessness behaviours.

Hoynes et al. (2016) investigated the relationship of financial resources (from receipt of Food Stamps – a disposable income transfer to low-income households containing young children⁹) in utero and during childhood to economic and health outcomes in adulthood.

⁸ The rejected mothers were slightly better off on observable characteristics compared with accepted mothers at the time of application.

⁹ The authors argue the Food Stamps programme is better understood as an income transfer programme because most recipients received a food stamp benefit below their normal food expenditures and the increases in food spending were in line with what could be expected from a cash transfer.

They used the Panel Study of Income Dynamics to link family background and county of residence in early childhood to adult health and economic outcomes. The authors' results suggest that access to food stamps in utero and childhood led to a significant reduction in the incidence of metabolic syndrome (a cluster of conditions including obesity, high blood pressure, heart disease, and diabetes) as well as increased reporting of being "in good health". In addition for women, there was an increase in economic self-sufficiency.

There is some evidence that shows childhood exposure to poverty (eg Miller et al. 2011 citing Kittleson et al. 2006) results in worse health in adulthood even when compared with others in the same occupational group (educated affluent physicians). That is, upward mobility did not appear to substantially change the health trajectory set in childhood.

Section Three: Impact of increasing the adequacy of welfare benefits on children's life course outcomes

From the evidence cited above, poverty affects a range of children's life course outcomes and important aspects of family functioning (including mediators of the outcomes). It also provides **some evidence that increases in household income from cash transfers positively affects children's and adult outcomes** and various mediators linked with children outcomes.

Several experimental and quasi-experimental studies reviewed by Cooper & Stewart (2013; 2017) investigated increases in family income from cash transfers. Findings for all but one of these studies show positive benefits for at least some of the child outcomes and/or mediators investigated. The income changes in a range of countries resulted from: variations in the Canadian and German child benefit; conditional cash transfers in Mexico; childcare subsidies in Norway; child tax credit changes and child benefit variations in the UK; the Earned Income Tax Credit expansion in the USA; cash transfers to tribal members in the USA; and anti-poverty programmes in the USA.

Butcher (2017) reviewed the literature on the long-run impact on children of cash transfers and food and nutrition programmes in the USA although much of the evidence relating to cash transfers was included in Cooper & Stewart's (2013; 2017) review, already covered in this paper. Butcher's review, along with reviews by Duncan et al (2011) and Nichols & Rothstein (2016) reiterate the importance of family income levels for children's outcomes, in the context of welfare programmes. In addition, Butcher (2017) notes that specific characteristics of a welfare programme may lead to different effects on children's outcomes. For example, programmes with income supplements combined with maternal employment requirements increased pre-school children's achievement in the short term. However, programmes with maternal employment requirements without income supplement did not increase children's achievement and some negative effects were observed. The negative effects included lower rates of breastfeeding, reduced prenatal care, and increased substantiated child maltreatment.

Although some programmes have positive effects, Butcher (2017) prefaces her review of the 'long-run benefits of transfers to low-income families' in the USA with two caveats. She noted that both cash and in-kind transfers intended for one purpose are to some extent exchangeable for other purposes. That is, families may or may not use the funds for the intended purpose. In addition, the transfer may result in unintended incentives / disincentives in relation to work.

Nichols & Rothstein (2016) reported that the combination of the Child Tax Credit and the Earned Income Tax Credit was successful at reducing child poverty in the USA. It was also shown to have positive effects on the likelihood of children ever enrolling in college and attaining a bachelor's degree and on women's physical and mental health (Butcher 2017). However, Butcher (2017) noted that the evidence on the longer-term effects of some welfare programmes on mothers' human capital development, employment and children's wellbeing is still light.

A study by Hoynes et al. (2016) did address the longer-term effects of parental access to Food Stamps while the child was in utero and during childhood. They found that access to Food Stamps was associated with a significant reduction (in adulthood) of the incidence of metabolic syndrome (a cluster of conditions including obesity, high blood pressure, heart disease, and diabetes) as well as increased reporting of being "in good health". In addition for women, there was an increase in economic self-sufficiency.

Applying these findings to the New Zealand context

There are no New Zealand studies about the effects of increasing the adequacy of benefits on children's life course outcomes. Evaluations of New Zealand welfare changes over time have not used study designs that assess these types of impact. This is clearly a gap in the evidence base that would be useful to fill.

A causal relationship between increasing cash transfers and improvements in child outcomes has been demonstrated across a range of studies within different countries (although not New Zealand). From this evidence, it can be concluded that family income does make a difference to children's life course outcomes and that includes income from cash transfers.

Unfortunately, the level of cash transfer needed to make a difference in the New Zealand context cannot be determined from the evidence in this brief review. One of the reasons is that the evidence in relation to the size of the effects is not well established.¹⁰ In addition, there are other limitations to applying effect sizes obtained from international studies to New Zealand. These include differences in New Zealand's socio-cultural context such as the population profile, income distributions, mix of public provision, and the incentives / disincentives that might be created. More evidence in relation to the New Zealand context would be useful addition to the evidence base.

Will increasing income through cash transfers improve children's life course outcomes?

Evidence indicates that family income impacts children's life course outcomes and that cash transfers to low-income families can have positive impacts. Extrapolating this evidence would suggest that increasing the income of families on low incomes is likely to improve a range of children's life course outcomes.

As noted above, increasing family income has the potential to affect multiple outcomes. Children from lower-income families are likely to benefit more from an increase in income than higher-income families because the relationship between the amount of family income and its effects on children's life course outcomes is non-linear. That is, an increase in family income influences children's outcomes to a greater extent for families at the bottom of the income distribution compared with families having higher incomes.

Evidence also suggests that the duration of poverty has greater negative effects on outcomes. As such, very short-term or one-off increases in family income may not mitigate the negative effects of poverty. Earlier exposure to poverty may have much more fundamental impacts on children's development but exposure throughout childhood and adolescence has impacts. Therefore, families with children across different age groups are affected by exposure to poverty.

¹⁰ Note the wide range of effect sizes obtained by Cooper & Stewart (2017) for similar outcomes cited in the previous section.

Conclusions on possible policy avenues to improve children's life course outcomes.

Authors who have reviewed the international evidence reach somewhat different conclusions about the effects of increases in household income. Several authors acknowledge that there is not a single solution but do consider, on the evidence, that increasing incomes along with other avenues such as building human capital are important for improving children's life course outcomes. Other authors emphasise the importance of the socio-emotional connections in children's lives and the importance of supporting parenting, mentoring and the provision of positive stimulating environments for children.

For example, Cooper & Stewart (2017 p 28) concluded that *"increases in household income cannot be seen as a magic bullet solution for inequalities in children's development and wider outcomes. But there is strong reason to believe that reducing income poverty would itself have important and measureable effects both on children's environment and on their development. This is not to suggest there is no value in policy interventions that aim to change structures to break the link between family income and lack of opportunities, but to highlight that these types of specific interventions are likely to have effects that are more domain-specific, compared with increased income which has been shown to affect a range of outcomes across different domains (mental and physical health, cognitive and behavioural as well as parental mental health and the home environment)."*

In sharp contrast, Heckman & Mosso (2014) state that there is *"little support for the claim that untargeted income transfer policies to poor families significantly boost child outcomes. Mentoring, parenting, and attachment are essential features of successful families and interventions to shape skills at all stages of childhood."* These authors consider the importance of untargeted cash transfers in shaping child outcomes has been exaggerated in the recent literature compared to the importance of parenting and mentoring. These authors underscore the importance of positive stimulating environments for children.

Like Cooper & Stewart (2017), Blair & Raver (2016) arrived at a more nuanced conclusion based on their review of the evidence of the costs of poverty to children's neuroendocrine function, early brain development and cognitive ability. These authors take into account the negative consequences of poverty-related adversity. They concluded that in *"supporting children's physiologic reactivity, cognitive control, and self-regulation through parenting- and classroom-based interventions, prevention scientists, policy makers, and practitioners are essentially working hard to alleviate the costs of poverty for human development. Yet it is equally imperative to work further upstream—to lower parents' and children's exposure to poverty and associated stressors in the first place."* They suggested two avenues of policy development - supporting families to build higher levels of human capital so as to increase earnings, and to increase income and non-income transfers to families so that they are less likely to be poor.

Section Four: Evidence relating to the impact of poverty in adulthood on adult wellbeing

'What is the impact of poverty in adulthood on adult wellbeing?' is a complex question. People grow into adulthood having been exposed to diverse physical and social environments, having developed a range of capacities based on those exposures and having acquired different levels of resources and assets with which they may be able to withstand financial shocks. People's experience of poverty in adulthood may be a continuation of childhood and adolescent exposures, whereas for others it may be a relatively new experience. People may experience poverty in early, middle or late adulthood with different consequences and trajectories. Reverse causation needs to be considered where associations of poverty with specific outcomes in adulthood might be due to the outcome causing poverty rather than poverty causing the outcome (eg Kim & Von Dem Knesebeck 2018).

The association between poverty and adult outcomes is well established. People with lower incomes tend to have worse outcomes across a range of domains (eg Easterlin 2001; Mackenbach et al. 2017; Ministry of Social Development 2016). The focus of this review is on evidence relating to the causal impacts of poverty in adulthood on adult wellbeing. Unfortunately, the evidence in relation to causal impacts is not extensive (both in terms of outcomes coverage and research designs). Therefore, currently, the evidence necessary to answer the question is very limited.

The following provides a summary of the evidence from reviews by Cooper & Stewart (2015), Kim et al. (2018) and several more recent studies. Overall, the evidence on causal relationships is not sufficiently comprehensive to provide firm conclusions except perhaps in relation to mental health outcomes.

Cooper & Stewart (2015) conducted a systematic review concentrating on the relationship between household or individual financial resources in adulthood and adult outcomes. As with their review of the effect of household financial resources in childhood on child and adolescent outcomes, this review was restricted to randomised control trials, natural experiments, studies using an instrumental variable approach and longitudinal studies using fixed effects or similar approaches.

The review approach meant that they were unable to examine the effect of long-term and persistent differences in financial resources between households. Instead most of the studies reflected the influence of marginal income changes, which were often quite small (for example, adjustments to social security benefits) or short-term one-off increases from lottery wins or bequests.

Table 3 summarises Cooper & Stewart's review results from 54 studies by outcome category. Results were mixed within the outcome categories they included.

Mental health, happiness and life satisfaction are affected by poverty

The most consistent finding was for 16 studies investigating the relationship between financial resources and indicators of mental health, happiness or life satisfaction. All but one of the studies found a positive result. A more recent study using longitudinal data in Australia tested the possibility of reverse causation (Kiely et al. 2015). These authors found that financial hardship is associated with the onset of mental health problems over time. Respondents who reported deprivation and cashflow problems had greater risk of mental health problems than those who did not. Individuals vulnerable to hardship had greater risk of mental health problems, even at the times they did not report hardship.

However, their risk of mental health problems was greater on occasions when they did experience hardship.

The evidence also suggests that the relationship between income and mental health/life satisfaction/happiness is non-linear, where the same proportional change in income has a larger effect on lower income households.¹¹

Four of the studies reviewed by Cooper & Stewart (2015) examined relative financial resources (measures of income inequality) and subjective wellbeing. The two studies which examined happiness showed positive results while the two which examined mental health found no significant effects or a very weak effect in some specifications.

Table 3: Summary of results^a reviewed by Cooper & Stewart (2015) by outcomes

Outcome	Studies including outcome	Negative results	No effect	Positive results	Mixed results	Depends on interpretation
Happiness and mental health	16		1	15		
Health behaviours	8	3		4	1	
BMI / Obesity	12	4	4	4		
Health outcomes	9	3	2	4		
Relationship stability	6		1			5
Domestic abuse	2			2		
Social and political participation	3		1	1		1
Employment	9		3			6
Education	4		1	3		
Total	54					

Source: Cooper & Stewart (2015 p.18)

a For studies that included more than one outcome: Negative indicates a negative result on any of the measured outcomes; 'Positive' indicates positive result on any of the measured outcomes; 'Mixed' indicates that positive and negative results were obtained; and 'No effect' where neither positive or negative results were obtained.

Both positive and negative results were found across other outcome categories

The evidence relating to most of the remaining outcome categories in Cooper & Stewart's (2015) review showed both positive and negative results. The exceptions were for education and domestic abuse but these were based on a small number of studies.

¹¹ Evidence from studies examining lottery wins did not follow this pattern, and the authors state that this may reflect the unusual nature of lottery wins.

Health outcomes

Evidence reviewed by Cooper & Stewart (2015) in relation to the effect of income on health behaviours, BMI and physical health was not consistent. It is difficult to draw conclusions from this evidence due to the small number of studies, the short-term nature of studies, and the heterogeneous nature of the income changes, populations and outcomes. For example, for health behaviours, all but one of the studies showing negative effects on health behaviours (or no effect) related to the change in income being due to lottery wins or inheritances. However, for parents, receiving extra money resulted in improvements in health behaviour. Cooper & Stewart (2015) conclude that the mixed effects for health suggest that it is difficult to change things later in life and investing early in childhood is needed to influence the life course drivers of health and wellbeing.

Kim et al. (2018) reviewed the effect of poverty on adult brain structure and adult physiological functioning. These authors noted that the evidence on brain structure largely reflects associations, as most of the adult-focused studies on adult brain structure do not control for childhood socio-economic disadvantage (SED)¹² or the trajectories of SED across childhood. Many of the studies investigate areas of the brain affecting adult cognitive functions and, in general, these studies suggest that poverty in adulthood is associated with declines in these brain areas.¹³ Some of the changes in brain structure are associated with inflammatory processes.

There is relatively robust evidence on sympathetic nervous system dysregulation in conjunction with adult SED exposure (Kim et al. 2018 p.475). These measures of physiological dysregulation include: high resting blood pressure, reduced blood pressure reactivity and reduced heart rate reactivity; changes in the hypothalamus-pituitary-axis resulting in elevated cortisol levels; elevated levels of inflammatory markers; metabolic malfunction; and higher levels of allostatic load. *"Taken together, there is evidence for links between SED exposure and physiological stress dysregulation across the adult lifespan."* (Kim et al. 2018 p.476).

Relationships, domestic abuse, employment and social/political participation

Cooper & Stewart (2015) reviewed the results from a small number of studies investigating the impact of financial resources on relationship stability, domestic abuse, employment, education or social/political participation. Overall, there are no clear trends for these outcomes. The exception may be adult education and domestic abuse outcome categories, where the findings were generally positive. However, the findings for these two outcome categories are from a very small number of studies, so further evidence would be helpful.

Cooper & Stewart (2015) suggest their results indicate that money gives people choices in a range of areas. This includes choices in relation to their employment, the educational institutions and programmes they attend, and whether to stay in or leave relationships.

A more recent study by Mood & Jonsson (2016) investigated whether poverty affects four social outcomes—close social relations (social support), other social relations

¹² As noted above, Kim et al.'s (2018) review included studies using measures of poverty such as family income and material hardship but also studies using measures of socio-economic position such as parental occupational status or parental education. Area level measures were also considered in their review in relation to the effects of adult socio-economic disadvantage (SED) on adult physiological outcomes.

¹³ It should be noted that some of this literature uses neighbourhood measures of SED.

(friends and relatives), political participation, and activity in organisations—across five different poverty indicators. They used longitudinal data from Sweden examining how entering or exiting poverty is associated with social outcomes. Their main conclusion was that poverty in general has negative effects on social life but more harmful effects for relations with friends and relatives than for social support; and more for political participation than organisational activity. Different measures of poverty also functioned differently in relation to poverty. The measure of material deprivation appeared to have a greater influence on social outcomes than the measures of absolute and relative income poverty.

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Appendix 1

Figure 2: Conceptual Framework for Effects of Poverty on Child and Youth Mental Emotional and Behavioural Health (Yoshikawa et al. 2012)

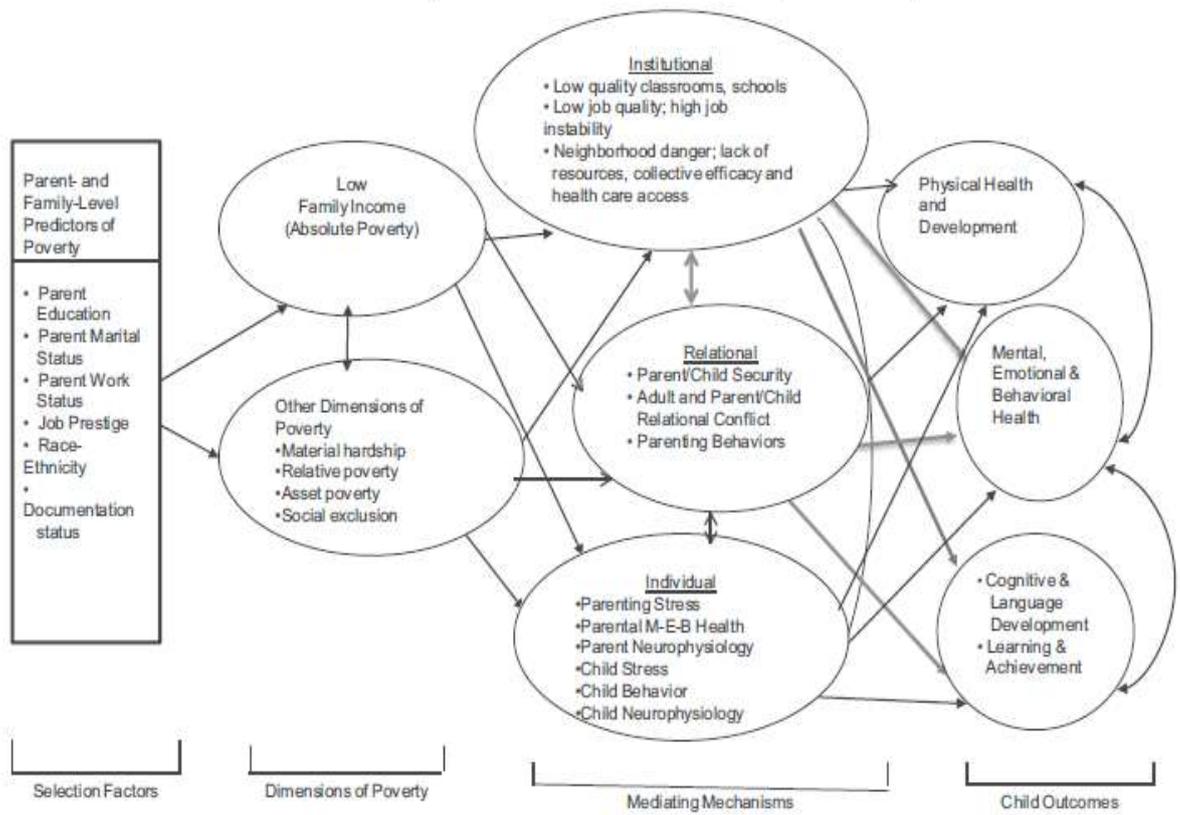
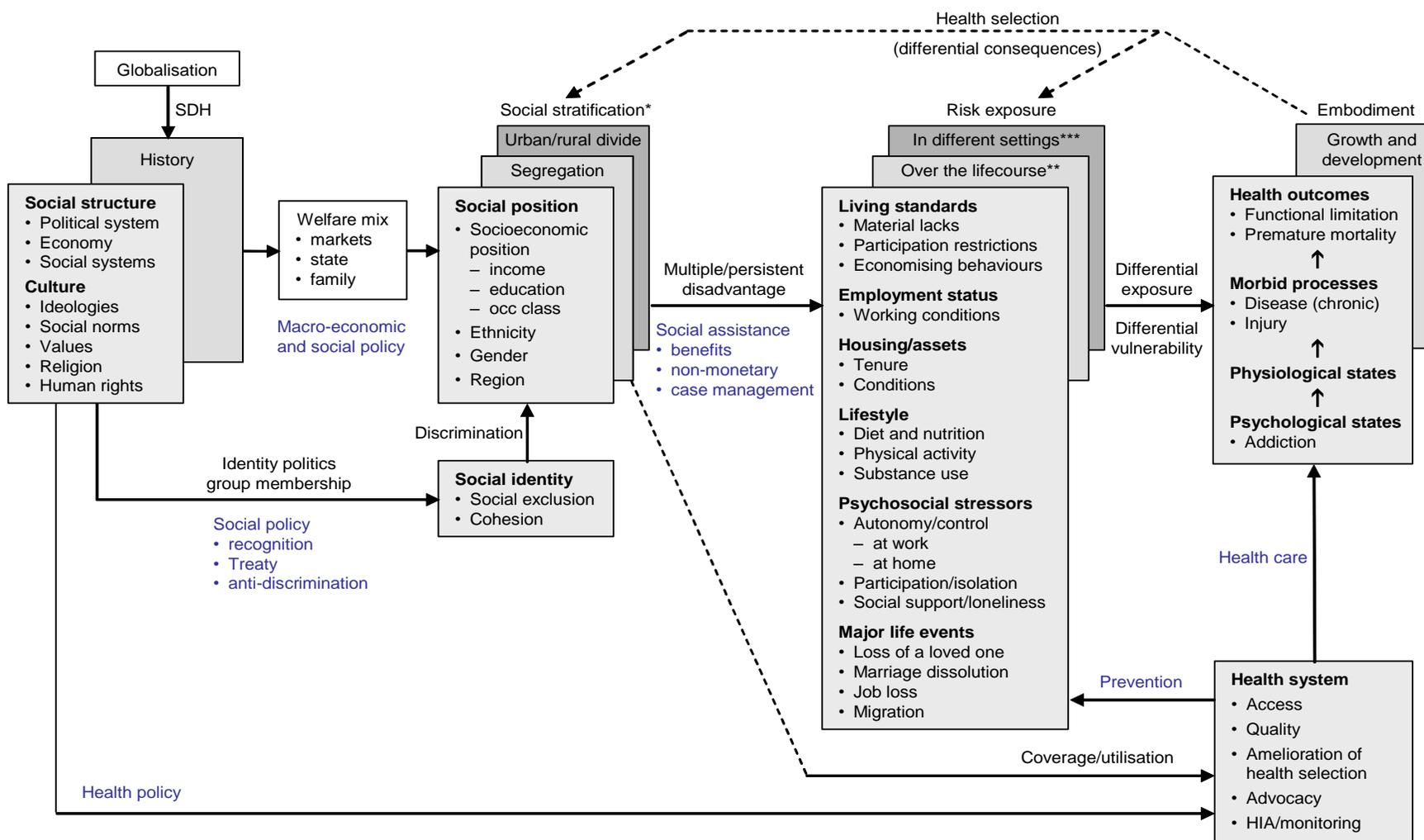


Figure: Conceptual model of social determinants of health (SDH) and health inequality[†]



* Distribution of SDH (power/privilege)

** Critical window/accumulation/trajectory

*** Family/neighbourhood/community

† Only major causal links shown

Source: Tobias and Mason (2010).