The nature of economic costs from child abuse and neglect in New Zealand

for
Every Child Counts

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Contents

1. INTRODUCTION

Every Child Counts is a coalition formed by Barnardos, Plunket, UNICEF, Save the Children, and the Institute of Public Policy at AUT with the aim of securing a positive future for children in New Zealand. As part of this wider aim, Every Child Counts has approached Infometrics to explore ways of estimating the economic costs and consequences of child abuse and neglect in New Zealand.

To date, Every Child Counts, and its members, have relied on social justice arguments for supporting children and their families. Notwithstanding the power and logic of such arguments, Every Child Counts wish to supplement these arguments with an assessment of the economic costs associated with child abuse and child neglect.

The New Zealand Government has substantially increased its investment into the prevention of child abuse and neglect in recent years. In the 2004 Budget departmental appropriations for education and preventative services for children amounted to just $16.1m, or 3% of the Child, Youth and Family appropriation in 2004/05. In the 2008 Budget this commitment had risen to $166m. However, adapting international cost estimates to the New Zealand situation suggests that every year child abuse and neglect generates a long term bill that is equivalent to around $NZ2bn (or over 1% of GDP).

Based on US studies, just 32% of this cost is likely to be the direct consequences of child abuse and neglect (eg health care, child welfare service, and justice system costs). A further 36% of costs relate to ongoing health, education, and criminal consequences for child abuse victims in later life. The final 32% of costs result from a decline in productivity as victims fail to meet their potential (Wang and Holton 2007).

The growing focus on prevention is a welcome development that reflects the current understanding of child development and the biological underpinning of this development process:

- The architecture of the brain and the process of skill formation are both influenced by an inextricable interaction between genetics and individual experience.
- Both the mastery of skills that are essential for economic success and the development of their underlying neural pathways follow hierarchical rules in a bottom-up sequence such that later attainment build on foundations that are laid down earlier.
- Cognitive, linguistic, social, and emotional competencies are interdependent, all are shaped powerfully by the experiences of the developing child, and all contribute to success in the work place
- Although adaptation continues throughout life, human abilities are formed in a predictable sequence of sensitive periods, during which the development of specific neural circuits and the behaviours they mediate are more plastic and, therefore, optimally receptive to environmental influences.

Brain development is continuous over many years. For children at unusually high risk, neuroscience provides a compelling argument for beginning intervention programmes at birth, if not prenatally. Developmental research shows that children master different skills at different ages, which suggests that opportunities for a variety of effective interventions are present throughout early childhood.

Looking forward the critical issues that still need to be resolved are:

- Is the current level of government spending on preventing child abuse and neglect sufficient?
- How can one ensure that the appropriate level of resourcing is attained and maintained?
- What institutional arrangements will encourage the delivery of effective preventative services?

Answering the first question will require further New Zealand specific research, and this will also contribute to debate about the level of public commitment to the issue. Grunewald and Rolnick (2006) suggest an elegant approach to ensuring public commitment is maintained and which can foster innovation in the delivery of services aimed at reducing the incidence to child maltreatment: the creation of a public endowment. Grunewald and Rolnick consider the benefits of such an approach are that:

- It encourages private, innovative, and targeted provision of early childhood services (small scale, high quality interventions have demonstrated greater social returns than broad-based publicly provided schemes).
- It represents a permanent commitment and allows leverage of resources from public and private stakeholders.
- A permanent commitment sends a market signal to service providers that they can expect a consistent demand for their product.
- By drawing up a business plan that demonstrates it can win service provision contracts, a prospective provider can leverage funds for capital expansions as lenders will be assured by the stability of the early childhood development endowment.

In the next chapter section the consequences of child abuse and neglect are presented. The case for preventative intervention is presented in chapter 3. The final chapter discusses policy issues related to the promotion of a preventative approach to child abuse and neglect.

2. NATURE OF THE PROBLEM

In this section we define what can be regarded as child abuse and neglect, the evidence we have of its prevalence in New Zealand and review the current understanding of the impacts and consequences of the maltreatment of children.

Lievore and Mayhew (2007) define child abuse and neglect as including:

- Children witnessing inter-parental violence
- Physical discipline and physical abuse of children
- Childhood sexual abuse
- Child injury, mortality, homicide and suicide
- Child neglect

They also note that it is difficult to say where violence "begins" and researchers usually avoid defining where violence begins. Likewise there is little consensus on defining and measuring child neglect. Neglect is usually appended to abuse, perhaps as a way of avoiding having to define where violence or abuse actually begins or ends. However, neglect could be the more common and pernicious problem, mainly because it is less directly observable. For example Paxson and Waldfogel (1999) reported that the most common type of maltreatment reported to child protective services in the US was neglect, constituting 58% of all reports (physical abuse made up 22% of reports and the remaining 20% being other forms of maltreatment including sexual abuse).

The Centre for Social Research and Evaluation (2008) focuses on the issue from an outcomes perspective defining child maltreatment as the range of adult behaviours that can cause psychological and physical injury to children. This definition recognises the potential for far reaching consequences of abusive actions. They go on to note that although psychological abuse can occur without physical abuse, physical abuse is almost always accompanied by psychological abuse.

The importance of psychological harm is illustrated in Lievore and Mayhew (2007), who quote a study of children who witnessed adult violence at home reported that the effect was slightly more distressing than the direct experience of being punched, kicked, beaten or hit by adults. The harm was often considerable and lasting (p8).

Prevalence of the problem in New Zealand

Lievore and Mayhew (2007, p4) note that measures of family violence are likely to undercount its prevalence due to its sensitive and often covert nature:

- Victims may be reluctant to divulge what has happened
- Offenders may also be reluctant to report honestly
- Administrative data only captures cases drawn to official attention.

Even so, Lievore and Mayhew (2007, p8) report that four out of ten respondents to the Christchurch cohort study reported having witnessed at least one violent act by one or more parent, with the majority comprising emotional violence or destruction of property. Perhaps more alarming is that 10% of the Dunedin cohort reported more than five acts of physical violence. They also quote a study of the Christchurch cohort study which found that 4% of the cohort reported experiencing "overly frequent, harsh or abusive punishment by parents. Studies of the Dunedin cohort found a reasonably similar proportion, 6%, who reported to have been subject to severe physical punishment in childhood (p42).

According to the studies quoted by Lievore and Mayhew (2007), extreme punishment was more likely to be administered by fathers and stepfathers than mothers. Extreme punishment was not associated with the seriousness of the misdemeanour, but with parental characteristics such as temper or alcoholism.

Of course, an extreme outcome of abuse and neglect is the death of the child. Lievore and Mayhew (2007) note that:

- Very young children, boys and Maori children are most at risk of dying as a consequence of violent acts in New Zealand.
- Battering and head injuries are frequently involved in deaths resulting from child abuse.
- Most perpetrators are parents.

Between 2000 and 2004 39 children under the age of 17 were murdered in New Zealand (Family Violence Statistics Fact Sheet). In the 2005/06 Fiscal year, 65,159 children were present at recorded family violence incidents and offences. The Department of Child, Youth and Family received 66,210 notifications in 2005/06, with 49,063 requiring further action and 5,077 children in care placements.

At risk children

The risk of abuse appears to be influenced by the characteristics of the parents in combination with environmental pressures. For example Paxson and Waldfogel (1999) found that US states with higher fractions of children with absent fathers, especially absent fathers with working mothers, had higher rates of reported child maltreatment. States with higher proportions of non-working fathers were also associated with higher rates of maltreatment, the contention being that lack of work can lead to parental depression and losses in self-esteem that increase the potential for abuse and neglect.

Although poverty is often highlighted as a marker for child maltreatment, it is at best just a partial marker. Instead it seems to be the way that income constraints impact on other parenting resources, like parental time and the quality of parental time, that increase the potential for child maltreatment. For example, although Berger (2005) found in his US study that although income was significantly related to violence towards children, it was only the case in single-parent households. Other markers of increased probability of child abuse and neglect identified by Berger and others include:

- Parental age and education, eg young or uneducated parents might not be naturally as well equipped to deal with the stresses of parenthood.
- Parental mental health problems such as depression.
- Social deprivation, in particular a lack of wider family support.
- Alcohol or other drug dependency issues.
- Past exposure of parents to interpersonal violence or abuse.

The Centre for Social Research and Evaluation (2008) describe the incidence of child maltreatment as the interaction of *predisposing*, *perpetuating* and *precipitating* risk factors.

Predisposition appears to be influenced by genetics and lifetime experiences. In particular it appears that adults who have been abused as children are more likely to abuse their children than adults without this history. However, the Centre for Social Research and Evaluation paper notes that this increase in propensity needs to be kept in perspective as the majority of parents who were maltreated actually do not abuse their own children.

Genetics also appear to play a role in predisposing violent behaviour in adults. For example, Caspi et al (2002) identified high levels of a genetically regulated enzyme as protecting children from later development of antisocial and violent behaviour. Young men who had low levels of the enzyme and were maltreated as children were nearly three times as likely to develop conduct disorder and nearly 10 times as likely to have a conviction for violence. Importantly it appears to be the combination of the child's experience of being abused and their genetic predisposition that increases the risk of later violent behaviour.

Perpetuating factors are defined as those that affect the family in a continuing or ongoing way. These can be external social or community influences, family situation influences, parental characteristics and factors relating to the child. Examples of such factors as identified in Centre for Social Research and Evaluation (2008) include:

Wider social context and community factors:

- Poor living standards
- Social norms that promote violence
- Access to alcohol and drugs
- Social isolation

Family context factors:

- Unintended pregnancy
- Financial deprivation
- Stress

- Unemployment
- Partner conflict or violence
- Lack of support from extended family

Parental or caregiver behaviour or characteristics:

- Lack of bonding with the baby
- Depression, physical, or mental health problems
- Alcohol or drug abuse
- Inadequate parenting skills (and lack of support)
- Involvement in criminal activity
- Lack of impulse control

Child characteristics:

- Unwanted child
- Disability or other high need characteristics.

Precipitating factors are those events that directly trigger an abusive episode such as incessant crying or a crisis event for the parent.

Impacts of abuse and neglect

The extreme form of child abuse is the violent death of the child. As mentioned above, 39 children under the age of 17 were murdered in New Zealand during the 2000 to 2004 period. Although each death represents a human tragedy, this number of child deaths in New Zealand would not, by themselves, necessarily justify further investment into the prevention of child abuse and neglect. Instead it is the long term impacts on child abuse survivors that provide the strong arguments for extra investment. Of course, a welcome spillover of more investment in preventing child maltreatment would be lower child fatality rates.

There are numerous studies pointing to the long term impacts of childhood abuse.

Health impacts

For example Mullen et al (1996) found from a study of women in Dunedin, that those who reported being exposed to some form of childhood abuse (sexual, physical or emotional) were more likely to have mental health issues (such as eating disorders, depression, low self-esteem, or suicidal behaviours), interpersonal, and sexual problems (early pregnancies) in adult life.

Pariante et al (2007) found, in a study of the Dunedin cohort study group at age 32, an increased probability of clinically-relevant inflammation in participants who had experienced maltreatment in childhood.

Romans et al (2002) found, from a random community sample of New Zealand women in 1995, that women who had reported childhood abuse had a significantly higher prevalence of chronic fatigue, bladder problems, headache including migraine, asthma, diabetes and heart problems.

Goodwin et al (2005) found, in a study of the Christchurch cohort, that an increased risk of later panic attacks and/or panic disorders following childhood exposure to sexual or physical abuse. Interestingly, and at odds with other evidence reported above about the impact of children witnessing in interparental violence, Goodwin et al could not find a relationship between exposure to interparental violence and later life panic disorders.

Criminality

Victims of child abuse can in turn become abusers themselves later in life. For example Lievore and Mayhew (2007) note (p9):

> *Studies have found that a disproportionate number of child sex offenders have histories of physical and sexual abuse. The victim-offender cycle is a popular explanation for why some boys and men sexually abuse children, although a history of abuse is neither a necessary nor a sufficient predictor of sex offending.*

More generally, in an analysis of the US National Longitudinal Stidy of Adolescent Health, Currie and Tekin (2006) concluded that child maltreatment approximately doubles the probability of engaging in many types of crime. They found that low socio-economic status children were both more likely to be mistreated and suffer more damaging effects. Boys were found to be at greater risk than girls, at least in terms of increased propensity to commit crime. Sexual abuse appeared to have the largest individual negative effect. However, the probability of engaging in crime increased with the experience of multiple forms of maltreatment as well as the experience of Child Protective Services investigation.

The positive relationship between Child Protective Services interventions and criminal activity is not necessarily causal. The Services involvement will tend to be focussed around already at-risk children, and so on individuals that already have an above average propensity to commit crime. However, there are two interesting implications of this identified relationship. The first is that the positive relationship suggests that although the interventions of Child Protective Services in the US may improve outcomes for the individuals (ie criminality might be lower than in the absence of such interventions), the interventions have not been sufficient by themselves to reduce the criminality of this group to the community average. Secondly, this result is consistent with the hypothesis put forward by Perry and Marcellus (1997) that in cases of chronic abuse and neglect, the very act of intervening can contribute to the child's perception of fear. Perry and Marcellus contend that investigation, court, removal, placement, re-location, and re-unification all contribute to the unknown, uncontrollable and frightening experiences of

the abused child. Well designed interventions can reduce fear by providing consistency, repetition (familiarity), nurturance, predictability and control. Poorly co-ordinated, over-burdened and reactive systems rarely provide those elements (Perry and Marcellus, 1997, p2).

Suicide

In a study associated with the Canterbury Suicide Project, Beautrais et al (1994) found a "strong and obvious relationship between childhood sexual abuse and suicidal behaviour when there is an increase of a dysfunctional family environment."

Also see McGowan et al (2008) discussed below in *How maltreatment disrupts skill development.*

General

Smith (2005) notes that physical punishment of children has been identified as having negative long term impacts on child development[1], such as:

- Antisocial behaviour (eg aggression towards others)
- Poorer cognitive development and lower academic achievement
- Poorer relationships between children and their parents and attachment issues
- Mental health problems (eg depression, anxiety and suicidal behaviours)
- Inhibited internalisation of moral values.

Costs of child abuse and neglect

In the 2008 Budget the New Zealand government appropriated $300.632m for care and protection services for children and young people in the 2008/09 fiscal year (New Zealand Government, 2008). A further $31.517m was appropriated for Family and Community Services, $5.104m for education and advice services for the prevention of child abuse and neglect, and for the promotion for wellbeing of children, young people, and their families, $97.797m for Youth Justice Services, $1.757m for the Children's Commissioner, $10.963m for counselling and rehabilitation services for children, young people and families, $5.771m for the purchase of education and prevention services, $8.170m for the Families Commission, $45.637m for Family Wellbeing Services (purchase of services that aim to improve the life outcomes for children, young people and families through support and development programmes, and programmes to prevent future harm or abuse), and $109.478m for Strong Families (a service to support vulnerable families and a focus on prevention and early intervention).

[1] Note this list relates to physical punishment rather than abuse. Although there is likely to be an overlap in outcomes at the heavy end of the punishment scale, the Smith study was not directly studying the impacts of child abuse and neglect.

This adds up to $616.826m, and represents 42.7% of the Ministry of Social Development's output appropriations in 2008/09, but just 1% of total government expenses or about 0.3% of GDP. Of these child-focused expenses, $450.836m represents a current cost of child abuse and neglect.[2] However, these are just some of the initial costs of child abuse and neglect. A more comprehensive list of the types of costs associated from child abuse is provided in the 2003 Keatsdale report into the costs of child abuse and neglect in Australia. The report identifies that following types of costs:

- Human costs to those abused including child fatalities, child abuse related suicide, medical costs, educational suffering, pain and suffering.
- Long term human and social costs including increased medical service usage, chronic health problems, lost productivity, juvenile delinquency, adult criminality, homelessness, substance abuse, and intergenerational transmission of abuse.
- Costs of public intervention including child protection services, out-of-home care, child abuse prevention programmes, assessment and treatment of abused children, law enforcement, judicial system, incarceration of abuse offenders, treatment of perpetrators, and victim support.
- Cost of community contributions by volunteers and non-government organisations.

Keatsdale (2003) produced a central estimate of $A4.9 bn for the costs of child abuse and neglect in Australia in the year to June 2002. This total estimate was made up of $A1.0 bn worth of human costs to those abused (eg the treatment costs of the injury and disability), $A1.9 bn worth of long term costs (eg juvenile delinquency and adult criminality), $A1.8 bn worth of public intervention (eg child protection services, victim support and law enforcement) and $A0.1 bn from community contributions (eg from community organisations and volunteers).

These numbers represent estimates of the long run costs of the amount of child abuse and neglect that occurred in 2001/02. This means that the same amount of abuse and neglect occurring the following year, would impose a further $A4.9 bn burden on society in Australia.

As there is considerable uncertainty in making such estimates (for example, what financial value do you put on a lost life?) Keatsdale provided high and low estimates, which suggested that the costs ranged from $A3.6 bn to $A6.4 bn. However, if anything the Keatsdale figures are likely to underestimate the true costs of child abuse and neglect. This view is based on the costs omitted from their study. For example, no estimate is made of the costs of ongoing or developing chronic health

[2] The other $165.99m is earmarked for preventative services and so can be regarded as investment in the future, rather than a current cost. We will return to this, and its adequacy in the next chapter.

consequences of abuse and neglect, of the potential of higher income support payments, and most importantly of the loss in productivity.

By not estimating the loss of productivity, the Keatsdale approach has ignored the opportunity cost of child abuse and neglect. Victims and society in general not only suffer from the costs that child abuse and neglect imposes, but also from the lost opportunities. Victims that do not progress through school as well as they might of will probably end up with lower paying jobs and have a higher risk of having to rely on income support in later life. Lower skill development hits in three compounding ways: the income of the victim is lower, their tax payments are lower and income support payments further add to the tax burden of others.

Despite the exclusion of these extra costs, the Keatsdale estimates imply a heavy burden imposed on society from child abuse and neglect. For example translating the Keatsdale estimates into New Zealand terms[3] implies that the equivalent estimate for New Zealand in 2007 would have ranged from $NZ1.1 bn to $NZ2.0 bn, with a central estimate of $NZ1.5bn. This estimate implicitly assumes that the New Zealand and Australia suffer from the same proportional amount of child abuse and neglect, the same types of abuse and neglect, and the same resulting cost structure. These might prove to be implausible assumptions, however as the base Keatsdale estimates do not allow for opportunity costs, these estimates can be safely regarded as being conservative.

Wang and Holton (2007) conduct a similar analysis for the US but also include an estimate of lost productivity due to child maltreatment. Their estimate for 2007 is a total cost of $US103.8 bn. Of this $US33.1 bn (32%) relates to direct costs (hospitalisation, mental health care costs, child welfare, and law enforcement services). Lost future productivity due to child maltreatment in 2007 is estimated at $US33.0 bn (32%). Future criminal costs are estimated to be $US28.0 bn (27%). Ongoing special education, juvenile delinquency and health care costs are estimated to cost the US a further $US9.7 bn.

Translating these costs into New Zealand terms (ie adjusting for the exchange rate and differences in population size) would imply an annual cost of child abuse and neglect of $NZ1.9 bn. Again this presumes a similar prevalence of child abuse in both countries.

This result appears consistent to what was obtained by adjusting the results from Australia – it comes at the high end of the Keatsdale range, but it does include quite significant estimates for future lost productivity (equivalent to $NZ617m). Despite the more comprehensive coverage of Wang and Holton, they still consider their cost estimates to be conservative. For example, their calculations only covered costs to

[3] This is done by adjusting the Keatsdale estimates for differences in the two countries populations in 2002 (3.9m in New Zealand compared with 19.7m in Australia), for differences in the proportions of children aged under 5 in 2002 (7.2% in New Zealand and 6.6% in Australia), for the New Zealand-Australian exchange rate (0.8215 in 2002), for inflation in New Zealand up to 2007 (15%), New Zealand population growth (up to 4.2m by 2007), and a decline in the proportion of children aged under 5 (to 6.9% of the population in 2007).

victims, and not other associated costs such as interventions and treatment to perpetrators. In addition, their estimates on lost productivity are limited to 5% of the total potential earnings of victims. No explicit allowance, for example, has been made of the lost earnings/production due to time spent in prison by child abuse and neglect victims who are convicted of crimes in later life.

With nominal GDP in 2007 of $NZ174.5 bn, the Keatsdale and the Wang and Horton estimates imply that child abuse and neglect impose an ongoing cost to the economy around 1% of GDP *every year*. To put this in context, removing such costs from the economy would potentially justify an investment today of over $NZ30 bn (based on annual costs of $NZ1.9 bn per year over 50 years and using a discount rate of 6%). Increasing the discount rate to 10%, would still justify an investment of $NZ19 bn.

These estimates are based on a presumption that New Zealand children have a similar exposure to abuse and neglect as in the US and Australia. Cross-country comparisons are always problematic and establishing New Zealand based cost estimates would be a useful area for future research. Unfortunately for the wrong reasons, US based estimates may not be totally inappropriate in the New Zealand context. For example, UNICEF's 2007 overview of child well-being in rich countries placed New Zealand and the US as the two worst performing OECD countries in terms of deaths caused by accidents, murder, suicide, and violence for people aged under 19.[4]

At present $166m of government appropriations to the Ministry of Social Development appear to be earmarked for providing services that will assist in the prevention of child abuse and neglect (New Zealand Government, 2008). This represents 0.1% of GDP and compares with annual costs resulting from child abuse that international evidence suggest are potentially more than ten times as big. In the next chapter we address why investing in preventing child abuse is likely to generate economic benefits and the implications this has for policy development.

[4] Such figures bundle together risks from multiple sources, many not related to child abuse and neglect. The data reported is also quite dated, relating to 1996-98 for the US and 1997-99 for New Zealand. However the death rates reported for New Zealand and the US are roughly triple that reported in Sweden.

3. THE CASE FOR PREVENTATIVE INTERVENTION

From a moral stand point, the issue between prevention and remediation probably hinges around the boundary between the sovereignty of the nation, the community, the family, and the individual. For example, where is the boundary between freedom to bring up children in the way that parents think is appropriate compared with ensuring viable protection for children? Our discussion below abstracts from these important moral issues that every society must address. Instead we confine our discussion to the economic issues of whether prevention is more cost effective than remediation. We begin with a discussion of the conceptual arguments for why preventive interventions are likely to be more cost effective. We then discuss the types of preventative strategies that are available and potential approaches to funding and delivering such interventions.

Studies in child development emphasise that different stages of the life cycle are critical to the formation of different abilities. When the opportunities for formation of these abilities are missed, remediation is costly, and full remediation is often prohibitively costly. This view developed initially based on observation and comparative analysis of differences in early childhood experiences and later life outcomes. More recently developments in neurosciences and epigenetics have generated biological hypotheses that offer plausible explanations for why path dependence seems to matter so much in child development. We begin with a background discussion on the role of skill development and economic performance.

Skill development

Skill development has important implications for both the later financial welfare of individuals, and potentially also generates further spillover benefits for others as well. There is broad-based evidence that higher skills (at least as proxied by educational attainment) are related to higher earning prospects at the individual level and that these individual returns to education have risen over the last half century (Temple 2001; Acemoglu 2002)

The evidence is less clear cut between higher educational attainment and economic growth, but a number of studies find that a positive relationship between education outcomes and economic growth, as suggested by theory, does exist (Bassanini and Scarpetta 2001; Temple 2001). Education is generally perceived to be a “merit” good, ie in the absence of government involvement society is likely to purchase less education services than is socially optimal. The economic argument for this is that the market only takes account of the private costs and benefits. It does not take account of the external benefits that may arise to society from everyone being educated. For example, if a well trained mechanic fixes the brakes on my car I receive a direct benefit which I pay for. If as a result I avoid crashing into you, you also benefit but this indirect benefit is more difficult to quantify and attribute to the skills of the mechanic.

The magnitude of economic benefits resulting from education is a hotly debated issue. Temple (2001) notes that there is a growing consensus

that the private returns from extra education ranges from 5 to 15%. That is, an extra year of schooling will on average result in individuals being able to command wages 5 to 15% higher than they would have received without the extra year of schooling. The impact on the total economy is likely to be less than such private returns. The analysis of Bassanini and Scarpetta (2001) indicates that one additional year of education is associated with an eventual 6% increase in output.

Of course, formal training is only part of what makes up highly valued skills. For example, much of the rise in income dispersion in the United States in recent decades has been between observationally similar people (ie people with similar qualifications working in similar occupations) indicating that "soft" skills (attitude, presentation, communication skills etc) are an important dimension to the economic value of skills (Acemoglu 2002).

In economics, human capital theory is based on a dynamic process of skill acquisition. The skills acquired in one stage of life affect both the initial conditions and the technology of learning at the next stage. Human capital development is a lifetime phenomenon and is influenced by families and firms, as well as schools. Authors, such as Carneiro and Heckman (2003), emphasise that a major determinant of successful schools is successful families. Carneiro and Heckman (2003) also demonstrate that the economic returns to second-chance remediation programmes (eg publicly provided job training) are low.

A general implication is that early intervention is more effective than later corrective action. Carneiro and Heckman note that the greatest effect of early childhood programmes is on non-cognitive skills, motivation and achievement, not on IQ. The success of early intervention revolves around their impact on encouraging participation in the education process – it is not that children learn more prior to school years but that they are better equipped to take advantage of the opportunities that arise later in school.

In summary:

- Skill development builds on past skill acquisition. Skill acquisition today sets one up to acquire a higher level or different type of skill in the future. Being able to count leads onto arithmetic, arithmetic leads onto mathematics.
- Skill development depends on both nature and nurture. Natural ability is built upon by years of schooling and training. The home environment will also influence both the duration of schooling and the level of application.
- Cognitive skills are only part of the equation. Work and life success depends as much on social attributes as on cognitive skills.

How maltreatment disrupts skill development

Advances in scientific understanding of brain development have greatly enhanced understanding of how child abuse and neglect can influence brain development and thus have long lasting impacts on skill development. Understanding of brain development has been informed

both by neuroscience and epigenetics. Epigenetics is the interface between genes, which are fixed, and the environment, which is ever changing. Although people are born with a complement of genes that they are stuck with for life, those genes can be switched on and off.

Early experiences determine whether a child's developing brain architecture provides a strong or weak foundation for all future learning, behaviour and health. Genes determine when brain circuits are formed, but a child's experiences shape how that formation unfolds.

Both brain architecture and developing skills are built "from the bottom up", with simple circuits and skills providing the scaffolding for more advanced circuits and skills over time. The brain continues developing after birth, starting from basic motor regulation functions towards more complex thinking and emotion regulation functions. As the brain develops we learn how to control our emotions and responses to external events.

For example, Feeny (2006) notes that aggression – long conceived to be a learned behaviour peaking in adolescence – is now seen to have genetic origins in early childhood and infancy, with the family environment playing a crucial role in moderating the degree to which this aggression develops in later life (also see Caspi et al 2002). Feeney quotes the research of Dionne et al[5] which showed that initially physical aggression has a strong genetic base. "At 18 months, 82% of observed physical aggression could be attributed to genetic forces. However by five years of age, the genetic influence is down to 0% (sic), while environmental influences increased from 18% to 42% over the same period. The issue seems not to that children learn to aggress, but rather that children learn not to aggress."

How abuse and neglect fits in is via the impact that traumatic events can have on brain development. For example, Perry and Marcellus (1997) note that traumatic experiences for children lead to fear-related brain activation, which leads to adaptive changes in emotional, behavioural and cognitive functioning to promote survival. Persistent or chronic activation of fear response can result in maladaptive persistence of the fear state. This activation causes hypervigilance, increased muscle tone, a focus on threat-related cues (typically non-verbal), anxiety, behavioural impulsivity, all of which are adaptive during a threatening event, but become maladaptive when the immediate threat has passed.

How stress and abuse influences brain development is an area of ongoing research. One area of interest is in how the release of hormones might influence brain development. For example McGowan et al (2008) compared brain structure between suicide victims with a history of childhood abuse or severe neglect with a control group who had died in accidents and had normal happy childhoods. McGowan et al (2008) concluded that their findings support the hypothesis that persistent elevation of stress hormones disrupts the brain's chemical balance that retards critical brain development. Although individuals differ in their

[5] Dionne G, Tremblay R,, Boivin M, Laplante D and Perusse D (2003) "Physical Aggression and Expressive Vocabulary in 19-month old twins", *Developmental Psychology*, Vol 39 (2), pp261-273

physiological responsiveness and adaptive capacities, these bodily reactions can lead to difficulties in learning and memory, as well as health damaging behaviours and later adult lifestyles that undermine wellbeing over time. Toxic stress in early childhood can result in a lifetime of greater susceptibility to physical illnesses (such as cardiovascular disease, hypertension, obesity, diabetes) as well as mental health problems (depression, anxiety disorders, and substance abuse).

There is some speculation that sometime in the future, drugs maybe developed that will enable the reversal of the damage to the brain resulting from childhood toxic stress (see for example The Economist (2008). However, such developments are at best still many years away. Even if future drugs have the potential to mitigate some of the psychological impacts of child abuse and neglect, it is less clear that they will be able to redress the vandalism to skill development suffered by victims of child maltreatment.

The case for preventative intervention: summary

Knudsen et al (2006) provide a neat summary of these interconnected concepts that underpin the case for investment in early childhood development:

- The architecture of the brain and the process of skill formation are both influenced by an inextricable interaction between genetics and individual experience.
- Both the mastery of skills that are essential for economic success and the development of their underlying neural pathways follow hierarchical rules in a bottom-up sequence such that later attainment build on foundations that are laid down earlier.
- Cognitive, linguistic, social, and emotional competencies are interdependent, all are shaped powerfully by the experiences of the developing child, and all contribute to success in the work place
- Although adaptation continues throughout life, human abilities are formed in a predictable sequence of sensitive periods, during which the development of specific neural circuits and the behaviours they mediate are more plastic and, therefore, optimally receptive to environmental influences.

Brain development is continuous over many years. For children at unusually high risk, neuroscience provides a compelling argument for beginning intervention programmes at birth, if not prenatally. Developmental research shows that children master different skills at different ages, which suggests that opportunities for a variety of effective interventions are present throughout early childhood.

4. POLICY ISSUES

So far we have established that abuse and neglect can impact on human capital development by harming brain development at vital early stages of brain development. Stress and trauma induce survival responses by the body that provide short term protection, but risk longer damage to brain development.

Although there may ultimately be some scope for medical advances that reverse the adverse impacts on brain development and the psychological impacts of maltreatment in childhood, it would appear prudent to focus policy prescriptions on the introduction of preventive measures. With current technology, remedial actions are costly and ineffective. A lack of preventative action consigns whole segments of society to outcomes well below their potential. It also imposes costs on the rest of their peers who have to put up with supporting them and dealing with the consequences of the later anti-social activities of many child abuse victims.

There remain a number of issues that need to be addressed before making any definitive recommendations. In particular:

a) Why is existing policy so slanted towards corrective and remedial actions?

b) Should early childhood development policy be targeted or universal?

c) What type of interventions should early childhood development policy promote?

d) How much should be invested in preventing child abuse and neglect and how should these investments be managed?

Why does policy undervalue prevention?

Translating overseas estimates of the costs of child abuse and neglect to the New Zealand context suggests that child abuse and neglect imposes long term costs in excess of 1% of GDP every year (see Costs of child abuse and neglect, above). Although the New Zealand government now commits at least $166m to fund services aimed at preventing child abuse, as recently as 2004, departmental appropriations for education and preventative services for children amounted to just $16.1m, or 3% of the Child, Youth and Family appropriation in 2004/05.

So why has it taken New Zealand so long to invest in the prevention of child maltreatment? Why have we instead been prepared to continue committing the nation to ongoing costs that are counted in billions? Although there has been a ten-fold increase in funding for preventative services, is this sufficient?

Ignorance of the size of the costs is potentially one reason. Another is natural biases in human preferences. Psychological studies generally find that people dislike losses far more than they like gains (Rabin 1998). An implication of this natural preference is that people may prefer public money being spent on fighting crime (ie on today's visible loss) than on making things better in the future. Such biases are also likely to influence

the behaviour of politicians, making it appear better to avoid a visible cost or mistake today than invest in less visible potential future gains.[6]

These points also raise a further natural bias against investment in the prevention of child abuse and neglect, the time preferences of the current generation of adults. Prevention has large upfront costs. Even if the economic and social return justifies the investment, the cohorts paying will not receive much of the resulting benefit. Most of the benefit is likely to accrue to the current generation of children. Encouraging investment in preventative activities will require a demonstration of the potential benefits to the older generation, which include:

- Gains in altruistic utility – knowing that they have done the right thing and knowing that their children's wellbeing will improve with this investment.
- Fiscal/economic savings will increase the ability for greater future support for the elderly. If less is required to be spent on justice, social welfare for the working aged, and if economic growth and the tax base broadens, then more can be spent on health and income support for the elderly.
- Prospects of lower crime in the future will increase people's feelings of security and wellbeing.

Should policy be targeted or universal?

When asked in an interview whether early childhood development interventions should be universal or targeted, Nobel Prize Laureate James Heckman was unequivocally in favour of targeted programmes (Federal Reserve Bank of Minneapolis 2005). Heckman noted that targeting was possible because family background is a major predictor of future behaviour of children. A disproportionate number of problem children come from disadvantaged families. The simple economics of intervention suggests that society should focus its investment where it is likely to have high returns, with the disadvantaged population.

Heckman also noted a problem with universal approaches is that it risks bundling issues relating to the support for working women with issues about providing development assistance for children. Universal approaches often have a "day care" aspect, which can encourage the development of opposition groups who resent subsidising affluent working women. As Heckman notes middle class families are already very successful at producing healthy productive kids. "It is foolish to try to substitute for what the middle-class and higher income families are already doing."

However, this issue should not be seen as an either/or decision, but more one of emphasis. There will be interventions that are well suited to universal delivery. The importance is ensuring that emphasis matches

[6] There is a large literature on imperfections in the ability of democratic processes to deliver policies that would be valued by the majority of a nation's citizens. Such factors will contribute to a sub-optimal mix of policies, but are not explored further here.

the expected returns. On one hand spreading resources too thinly across the whole population limits resources available for intensive interventions for high risk families. On the other, too much focus on high risk groups may limit the opportunity to provide advice at a more general level and/or screen for problems in families that do not exhibit the "standard" external markers of high risk.

Types of interventions

The Center on the Developing Child at Harvard University (2007) identifies the following factors that can enhance positive development in the first five years of life:

- Access to basic medical care for pregnant women and children can help prevent threats to healthy development as well as provide early diagnosis and appropriate management when problems emerge.
- For vulnerable families who are expecting a first child, early and intensive support by skilled home visitors can produce significant benefits for both the child and parents.
- For young children from low-income families, participation in high-quality, centre-based, early childhood education programmes has been demonstrated to enhance child cognitive and social development. Such programmes require:
    i. Highly skilled teachers
    ii. Small class sizes and high adult-to-child ratios
    iii. Age appropriate curricula and stimulating materials in a safe physical setting
    iv. A language-rich environment
    v. Warm, responsive interactions between staff and children
    vi. High and consistent levels of child participation
- For young children from families experiencing significant adversity, two-generation programmes that simultaneously provides direct support for parents and high-quality, centre-based care and education for the children have positive impacts on both.
- For young children experiencing toxic stress from recurrent child abuse or neglect, severe maternal depression, parental substance abuse, or family violence, intervention that provide intensive services matched to the specific problems can prevent disruption of brain architecture and promote better developmental outcomes. For example, individualised coaching aimed at increasing awareness of child behaviours and encouraging the use of praise and non violent discipline strategies.
- For families living under the poverty level, work-based income supplements for working parents have been demonstrated to boost the achievement of some young children. Studies suggest that these benefits are most likely to occur in the later preschool years.
- Environmental policies that reduce the level of neurotoxins in the environment will protect foetuses and young children from exposure to

substances that are known to damage their developing brains. For example the reduction of lead in petrol and paint, and reductions of mercury in the food chain.

- No single programme or approach has been shown to be a silver bullet.
- Scaling up successful model interventions is a formidable challenge.
- Return on investment is more important than up-front costs

This last point should be interpreted as a finance issue and not about dismissing costs. Ignoring costs in public investments can simply result in high cost solutions that reduce funds available for other public projects (Hanushek 1996). A focus on costs is an important part of the policy prescription approach. However, more important than how much is spent is on what is the money spent?

Top-down or bottom-up

In the game of obtaining value for money spent on early childhood development the critical issue has been the difficulty in obtaining the same type of outcomes from broad-based programmes as from small scale programmes. There are many small scale programmes that have been well-resourced and well evaluated and that show promise or positive effect, but fewer examples of successful broad-based schemes.

For example, studies into the benefits of early childhood development programmes often refer to the Perry Preschool Project, with cost benefit calculation suggesting that each dollar invested in quality early childhood education saves $7 by reducing later grade repetition and special education placement, and increasing high school graduation rates. The returns from other broad based schemes, such as Head Start, although positive are far less spectacular (Currie 2001).

Grunewald and Rolnick (2006) argue that a problem with large scale programmes is their top-down, planned design. A successful small-scale programme will involve a number of characteristics and it can be difficult to isolate the key factors that contributed most to its success, or identify which of these can be used in other programmes in other environments. In addition, there is the risk that resources are diverted away from children and their families into running the bureaucracy and creating an overarching infrastructure.

On the other hand, there will also be a good number of poorly designed small scale programmes. Such schemes would have benefitted from advice from well informed central agencies. Is there a way of balancing the delivery of child abuse prevention services that can both encourage a flexible delivery approach that can be matched to specific circumstances, but also can benefit from the collected wisdom of a central agency?

Grunewald and Rolnick (2006) argue that large-scale programmes can succeed if they have the following three features:

- The programmes focus on at-risk children and encourage direct parent involvement.

- There is a long term commitment to reducing the incidence of child maltreatment.
- The programmes reward successful outcomes in order to encourage high quality and innovative practices.

Grunewald and Rolnick argue that the creation of an endowed fund will potentially provide a flexible mechanism for delivering publicly funded early childhood services. They contend that a fund approach has the following benefits:

- It encourages private, innovative, and targeted provision of early childhood services (small scale, high quality interventions have demonstrated greater social returns than broad-based publicly provided schemes).
- The creation of an endowment represents a permanent commitment and allows leverage of resources from public and private stakeholder.
- A permanent commitment sends a market signal to service providers that they can expect a consistent demand for their product.
- By drawing up a business plan that demonstrates it can win service provision contracts, a prospective provider can leverage funds for capital expansions as lenders will be assured by the stability of the early childhood development endowment.

The potential drawbacks to an endowment approach include:

- The novelty of the approach, compared with our tradition of funding from current government spending, will be a barrier to some.
- The setting up of an endowment fund will require a large set up expense.
- Care would be required in setting up an appropriate governance structure that protects public funds yet encourages the funding of innovative interventions.

Essentially the creation of an endowed fund to address child maltreatment issues is analogous to the creation of an independent central bank with the purpose of maintaining price stability. The creation of the fund would signal a long term commitment to preventing child abuse and neglect. As with inflation, child abuse and neglect imposes significant avoidable costs that are typically born by vulnerable segments of society. How big the fund should be would require further research. However, if the costs of child abuse and neglect are in the vicinity of $2bn per year, as suggested by cost estimates in the US and Australia, then this implies that the economic payback from reducing child maltreatment is potentially very large.

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