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# The Economics of **EARLY INTERVENTION**

*“The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom.”*

Isaac Asimov

Brainwave Trust Aotearoa made a submission to the Health Select Committee’s Inquiry into preventing child abuse and improving children’s health outcomes in May 2012 in response to the first term of reference for the enquiry “to update knowledge of what factors influence best childhood outcomes from before conception to 3 years, and what are significant barriers regarding the impact of early experience on a child’s brain development”. We have been asked to provide further information on the economic argument for early intervention. This paper will demonstrate that intervening in the early years is not only effective but also economically efficient.

## INTRODUCTION

The case for intervention often rests on arguments of social justice and social good, such as removing inequality or reducing crime, however there are also economic ones. In this context, interventions are assumed to be ones that have been proven to work and produce the desired outcomes.

The economic argument for interventions is based on the cost of the interventions and a financial value attributable to the results, usually over a lifetime.

The economic argument for early intervention is based on the principle that given available resources are limited, investments in interventions should happen where they have the best chance of long term success and the best return for every dollar spent.

The social justice arguments for intervening in children’s lives are readily apparent. However there are now powerful economic arguments for the same, thanks in large part to the pioneering work of Nobel laureate, Professor James Heckman and his colleagues. His work has married an understanding of developmental neuroscience (which has highlighted unique developmental opportunities and vulnerabilities in infancy and early childhood and their long term consequences) with detailed economic

analysis. Whilst his work is primarily about the accumulation of human capital the spin offs are in many domains including better mental and physical health, lower

imprisonment rates, lower unemployment, better school achievement etc. Some of the answer in improving productivity as a nation will, maybe surprisingly, be in how we treat our young children.

In Heckman’s (2000) words:

*“The real question is how to use the available funds wisely. The best evidence supports the policy prescription: invest in the very young and improve basic learning and socialisation skills”*

We note that by using scarce resources for targeted interventions to those most in need rather than universal interventions, the goal is equality of outcomes rather than equality of inputs or delivery.

## RISK AND PROTECTIVE FACTORS – an aid to targeting

Much of the scientific literature identifies risk factors which increase the likelihood of poor outcomes. Most children have some risk factors but, in terms of outcomes, these can be balanced by the protective factors which children also experience.

Risk factors can be considered like a pile of children’s wooden blocks. It is the piling up of them, one after the other, without the support of foundations or cross braces (the protective factors) which cause the problem. The “final block” which made the tower fall over is often seen as the cause of a particular behaviour or outcome rather than the combination of the risk and protective factors. It is tempting to treat the “final block” instead of see the pattern of the blocks before them. Further it is the number of risk and protective factors which are important, not the existence of any one of these. In the same way, if just one block (risk factor) is removed or one more scaffold (protective factor) is introduced the tower can be more robust.

We know that most children from poor families thrive. However, for many families in poverty there are also other risk factors including drug and alcohol addictions, poor housing and housing mobility, moving schools regularly, chaotic households and unpredictable care, family violence. In the absence of strong family relationships the risks of poor outcomes are dramatically increased. By removing just one risk or adding one protective factor, benefits can be achieved.

We note that two children with ostensibly the same set of risk factors may nonetheless have significantly diverse outcomes – thanks to the complex interplay of their genes and in-utero experience with their postnatal environment and experiences.

## EARLY INTERVENTION – the Economic Argument

All governments operate in a constrained fiscal environment. The principal funding mechanism is through tax and voters typically have limited appetite for ongoing increases in tax. Benefit-cost analysis allows governments to spend their scarce resources where results can be shown it is worth it. Cost-effectiveness alone will dictate the decision among competing program models, but it cannot show that the total effect was worth the cost of the program (Weinrott, Jones & Howard, 1982, p179, cited in Welsh & Farrington, 2011)

There are a number of programmes that have been shown through careful experimental

design to be effective in changing behavioural outcomes, for example i.e. they do actually work. For most programmes it is reasonably straightforward to identify the costs.

Cost effectiveness is also relatively easy to count and can be used to choose between programmes with similar outcomes. If we can achieve x with each of these programmes, then which one uses the least cost and will be therefore most cost effective?

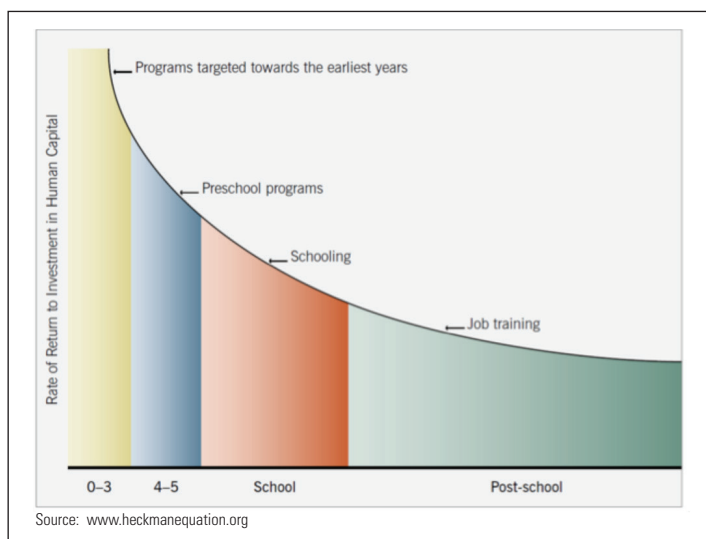
It is, however, highly complex to calculate the cost-benefit and understand the long term financial benefits of these interventions. The much discussed Perry Preschool project is one of the few that have been subject to long term follow up between a control and the subjects.

Recent research by James Heckman, Nobel Laureate in Economic Sciences and others has introduced a new level of analysis into the importance of family with respect to the cognitive and socio-emotional skills development of children. He emphasises the ability of non-cognitive skills like motivation and self confidence to moderate the impact of genetic disadvantages on socioeconomic success in later life. Poor non-cognitive skills are powerfully influential in terms of a child's subsequent involvement in crime, teenage pregnancy and education (Heckman et al, 2006). His work has for the first time intertwined economic analysis with an understanding of brain development in the early years.

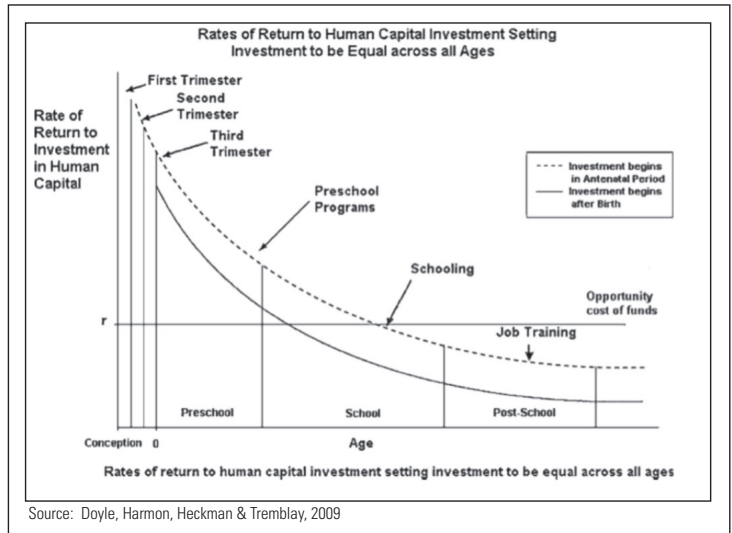
After decades of rigorous research a great deal is known about the early causes of delinquency and later offending, for example. There is a growing body of scientific research that shows that early prevention is an effective and worthwhile investment of public resources when comparing the economic benefits and costs of early prevention compared with imprisonment, for example (Welsh & Farrington, 2011).

Heckman posits that early interventions promote schooling, reduce crime, foster workforce productivity and reduce teenage pregnancy and are estimated to have high benefit-cost ratios and rates of return. The longer society waits to intervene in the life cycle of a disadvantaged child, the more costly it is to remediate disadvantage. We need to capitalise on knowledge about the importance of the early years in creating equality and in producing skills for the workforce. (Heckman, Big Ideas).

The following graph neatly summarises the impact of early intervention. The graph shows the rate of return to human capital across different age ranges when investment is set to be equal at each age. It powerfully illustrates the relative effectiveness of early intervention especially when typically the rate of spending is the exact reverse of this – low in the early years and much higher in the later years. Early investments generate returns over a longer time horizon and also raise the productivity of later investments: learning begets learning, and skills acquired early facilitate later learning.



Doyle et al have hypothesised further that the earlier the intervention – even into early pregnancy - the higher the return, however they suggest that an explicit study testing this hypothesis is required. This is demonstrated in the following graph.



While the work of Heckman and others does not specifically contemplate health outcomes, we know they also are highly related with early adversity, particularly early mental health issues.

Longitudinal research from the 'High Scope Perry Preschool Study' has provided much discussion and analysis regarding the long term effectiveness of appropriate early interventions. The study is a scientific experiment begun in the 1960s that has identified both the short- and long-term effects of a high-quality preschool education programme for young children living in poverty. The experimental design included randomly assigned control groups and has now been evaluated over 40 years. The intervention was just 2 and half hours per day, 5 days a week of high quality preschool with highly trained (all degree educated) staff for 3 and 4 year old children, as well as home visits by teachers at least once every 2 weeks.

An estimated rate of return (the return per dollar of cost) to the Perry Preschool Program is in excess of 14 percent (Heckman, Moon, Pinto, and Yavitz, 2008). This high rate of return is higher than standard returns on stock market equity and suggests that society at large can benefit substantially from such interventions. These are underestimates of the rate of return because they ignore the economic returns to health and mental health and intergenerational benefits.

Cunha and Heckman(2007b, in Heckman Big Idea) and Heckman and Masterov (2007, in Big Idea) say that early interventions promote economic efficiency and reduce lifetime inequality rather than suffering a trade-off between the two. Heckman maintains that the optimal policy is to invest relatively more in the early years. But early investment must be followed up to be effective. The returns to early childhood programmes are the highest for disadvantaged children who do not receive substantial amounts of parental investment in the early years, although this does not necessarily reflect family poverty or parental education – quality of parenting is the scarce resource in economic terms. He summarises that about 50% of the variance in inequality in lifetime earnings is determined by age 18. In shaping adult outcomes, the family plays a powerful role that is not fully appreciated in current policies around the world.

Current social policy directed toward children focuses on improving cognition. Yet more than intelligence is required for success in life. Gaps in both cognitive and noncognitive skills between the advantaged and the disadvantaged emerge early and can be traced in part to adverse early environments. A greater percentage of children in the United States and many other countries is being born into adverse environments.

Longitudinal studies find that the personal benefits (cognitive development, behaviour and social competence, educational attainment, and earnings), social benefits (reduced delinquency and crime) and government savings (higher tax revenues, reduced social welfare spending), associated with intervening early in a child's life clearly outweigh the costs (Karoly et al, 2005).

We note that the excellent returns to early education that Heckman

uses are mostly based on a limited number of expensive experiments in the 1960s and 1970s that provided rich early education and care for a few hours a week to limited numbers of disadvantaged 3 and 4 year old children. As such they cannot be extrapolated to suggest that universal preschool provides all the answers.

Heckman cautions against cherry picking selected aspects of a proven programme and expecting it to produce the same results. He also stresses the importance of high quality in preschool arrangements otherwise good outcomes cannot be expected.

The OECD recently reported that "country spending profiles examined are not consistent with the theory and evidence on child well-being. In contrast there is little or no obvious rationale for why so many Governments place the weight of their spending on late childhood".

## THE COSTS OF MALTREATMENT

There is a considerable cost burden to the country as the result of child maltreatment, which includes abuse and neglect in all its forms. Some of the areas where these costs accumulate are shown, as are the results of studies which have attempted to quantify the long term costs of maltreatment.

- Infometrics reported in August 2008 in "The nature of economic costs from child abuse and neglect in New Zealand" that, "based on overseas estimates, the annual cost of child abuse and neglect generates a bill every single year of around \$NZ2 billion (or over 1% of GDP)". The value today of spending \$NZ2 billion every year for the next 50 years is between NZ\$19 billion and NZ\$30 billion (depending on the discount rate - Infometrics used 10% to 6%). So, in economic terms, it would be cheaper for the country to spend up to, say NZ\$19 billion now than having to spend the \$2 billion we currently spend for each of the next 50 years.
- In a more recent report for Every Child Counts, on the effectiveness of public investment in New Zealand children, Infometrics reported in August 2011 that the economic cost to the New Zealand economy of poor child outcomes is of the order of 3% of GDP (approximately NZ\$6 billion).
- In March 2009, the top 300 children and young persons in CYF care cost NZ\$23 million per year – over \$75,000 per child on average. Most of these mainly 14 to 17 year old boys were already known to CYF as preschoolers.
- Vote Corrections for 2012-13 was NZ\$1.185 billion.
- Vote Social Development was over \$21 billion, around half of which is dedicated for payment and services other than for seniors.
- There are numerous demands on the health budget apart from the immediate care of damaged children which include much later mental and physical health issues. However, a significant portion of the health budget can be attributable to the results of an adverse start in life.

*"The health and social consequences of child maltreatment are more wide-ranging than death and injury alone and include major harm to the physical and mental health and development of victims."*



- The recently released Innocenti Report 11 (Unicef, 2013) highlights where New Zealand stands relative to other developed countries on a number of measures. We highlight a few of those statistics for which adverse early environments are known to be a risk factor. For example:

- Our child poverty rates of around 12% are comparable with Australia, somewhat higher than the UK and significantly lower than the US.
- We have the 5th highest teen fertility rate of 26 births per 1000 girls aged 15-19, compared with 15 in Australia and 5 in the Netherlands but better than the UK(30), US(36), Romania(31) and Bulgaria(40).
- NZ is one of only three countries, with Spain and Bulgaria, where more than 12% of young people aged 15 to 19 are not participating in either education, employment or training. This contrasts starkly with our overall 3rd best PISA scores of reading, maths and science literacy.

## EARLY INTERVENTION

Inequalities in health, cognitive development, and socio-emotional functioning emerge early in life. Many subsequent social issues, such as crime, teenage pregnancy, low education and unemployment can be traced to an adverse early years' environment. Targeted, early intervention programmes aimed at disadvantaged children and their families are an effective means of reducing these inequalities in that they can partially compensate for risk factors that compromise children's most critical stages of early development (Doyle, 2009).

Early intervention treats problems at source rather than waiting for an opportunity to treat the symptoms (Allen, 2011). We currently fund the treatment of "the symptoms" through the Health, Corrections, Education, Social Welfare and Justice budgets, among others.

The health and social consequences of child maltreatment are more wide-ranging than death and injury alone and include major harm to the physical and mental health and development of victims. And therefore contributes to a broad range of adverse physical and mental health outcomes that are costly, both to the child and society, over the course of a victim's life (WHO/IPSCAN, 2006).

Young children have less control over their environments than individuals at almost any other stage of development. As individuals age, they gain the independence and ability to shape their environments, rendering intervention efforts more complicated and costly (Duncan and Magnuson, 2004).

"The length of human life and the portion of it spent with parents provide abundant opportunities for individual and parent-focused interventions designed to enhance human potential." (Duncan and Magnuson p24, 2004)

Early childhood programmes have wide appeal across a large spectrum of constituencies as they help society's most vulnerable members. Their explicit aims include improvement in children's immediate learning and social and emotional competencies, and the improvement of children's success over the life-course. Also, they are implemented at a time when children are most impressionable and receptive to interventions. To the extent that "skill begets skill", interventions earlier in life taken on added importance since they can help ensure that children attain competencies needed to profit from opportunities later in life (Duncan & Magnuson, 2004).

## COSTLY OUTCOMES

This section identifies research which links adverse early experiences to a variety of poor outcomes to demonstrate these links in a number of domains. The list is not exhaustive but representative of the wide and rapidly accumulating body of knowledge.

There are a number of international longitudinal studies, particularly in the UK and NZ, that are useful in that they help to identify causes of problems rather than just the risks of poor outcomes. The scientific literature continues to mine these data sets and hundreds of papers are produced every year. Three highly regarded New Zealand studies form an important part of this body of research. The Dunedin Multidisciplinary Health and Development Study (1972/73) and the Christchurch Health and Development Study (1977) are two such studies which have provided rich data and have been most helpful in understanding risks and cause and effect. Growing Up in New Zealand is a new longitudinal study which recruited 7000+ babies born in 2008 and represents

the changes in the New Zealand population some 35-40 years later. Thousands of papers have been published in peer reviewed journals from longitudinal studies which have established connections between treatment of children in the early years and long term outcomes.

Although much of the research identifies risks and causes of bad outcomes but often the exact mechanism is not yet understood. Much current research is striving to understand the exact mechanism. An example is the epigenetic changes which can occur as the result of the early environment which can then be passed on to the next generation. This research is still evolving in content and clarity.

## PHYSICAL AND MENTAL HEALTH

There are now numerous studies which link early maltreatment of children with ongoing physical and mental health problems. One of the mechanisms at play is the role of stress in children's lives. Stress is a part of every life to varying degrees, but individuals differ in their stress vulnerability. Frequent neurobiological stress responses increase the risk of physical and mental health problems, perhaps particularly when experienced during periods of rapid brain development (Gunnar & Quevedo, 2007).

Our understanding of the long term effect of maltreatment (abuse and neglect, for example) and household dysfunction (e.g. marital discord, parent with alcohol and drug dependence) during childhood (known as "adverse childhood experiences" or ACEs) and adult health issues has been deepened by longitudinal research from the United States known as the ACE studies. Dozens of papers have been published based on the original data ([www.cdc.gov/ace](http://www.cdc.gov/ace)). These studies are among the first to study the impact of more than one type of abuse and counted one type of experience as 1 point e.g. examples of ongoing physical abuse count only once regardless of how often they occur. The findings indicate strong links between adverse experiences during childhood and adolescence, and chronic diseases, mental health issues and unhealthy behaviours such as substance abuse that occur many years later.

Those with many ACEs were more likely to have many health risk factors later in life (Felitti et al, 1998), however these consequences of early adversity may not be seen for many years (Anda, Butchart, Felitti, & Brown, 2010). For example, compared to those who grew up with no domestic violence, the adjusted odds ratio for any individual ACE was approximately two to six times higher if Intimate Partner Violence (IPV) occurred. There was also a powerful graded increase in the prevalence of every category of ACE as the frequency of witnessing IPV increased. In addition, the total number of ACEs was increased dramatically for those who had witnessed IPV during childhood. There was a positive graded risk for self-reported alcoholism, illicit drug use, iv drug use and depressed affect as the frequency of witnessing IPV increased (Dube et al, 2002). This highlights the perhaps unseen risks for children and the need to consider interventions for these children when this type of violence is exposed.

An adult with an ACE score of 4 or more was 2-4 times more likely to smoke, have poor health, have 50 or more sexual partners, and have had sexually transmitted disease compared to those with an ACE score of zero. An ACE score of 4 or more was also associated with a 4-12 fold increased likelihood of alcoholism, drug abuse, depression, and suicide attempt (Felitti et al, 1998).

The risk of developing Ischaemic Heart Disease (IHD) was significantly increased among those exposed to even one ACE (with the exception of marital discord) and those with an ACE Score of 7 or more were more than 3 times more likely to have IHD than those with none (Dong et al, 2004).

Childhood traumatic stress increased the likelihood of hospitalisation with an auto-immune disease such as coeliac disease, rheumatoid arthritis, multiple sclerosis, insulin-dependent diabetes, and irritable bowel syndrome. For women aged between 19 and 64, every increase in ACE Score increased the likelihood of an auto-immune disease related hospitalisation by 20%. These conditions may occur decades into adulthood and, it was suggested, may be as a result of the effect of the stress on the developing nervous system and immune function (Dube et al, 2009).

Risk behaviours such as smoking, over eating and physical inactivity may occur as responses by individuals to cope with the stresses they have experienced (Dong et al, 2004) and may explain why public health and prevention messages may not work for people who have suffered adverse childhood experiences.

The ACE research has also considered the potential protective effects of family strengths against early initiation of sexual activity, adolescent pregnancy and their long-term psychosocial consequences. Each category of family strength reported as being present (for women) was associated with a 30-40% decreased risk of adolescent pregnancy, and as the number of family strengths increased, the risk further decreased. These family strengths were found to be especially protective against early initiation of sexual activity for women who had experienced abuse or family dysfunction (Hillis et al, 2010).

Intervening in the zero-to-three period, when children are at their most receptive stage of development, has the potential to permanently alter their development trajectories and protect them against risk factors present in their early environment. Both biological and environmental conditions play a role. Children from low socioeconomic backgrounds typically have poorer health in terms of the prevalence of illness, the severity of illness, the likelihood of mortality, and the incidence of disease (Chen et al, 2002 in Doyle et al, 2009). Possible explanations for this include genetic influences, environmental exposures to toxins, quality of medical care, and behavioural factors (Anderson & Armstead, 1995 in Doyle et al, 2009).

## MENTAL HEALTH

The most common childhood mental health difficulties are conduct problems. Many studies look at this range of behavioural problems known as conduct problems, the most serious end of which is Conduct Disorder, a psychiatric diagnosis. A high proportion of those with conduct problems will go on to become involved in criminal activity (see later). These problems have many causes but early family relationships and parenting styles are particularly significant (Sainsbury, 2009). This section identifies the link between early behavioural problems and later ones and that many of these problems can be identified early.

A study of childhood mental health and life chances based on national birth cohort surveys (Richards and Abbott, 2009) showed that early mental health problems can lead to a wide range of adverse outcomes in later life, including continuing mental health difficulties, poor educational performance, unemployment, low earnings, teenage parenthood, marital problems and criminal activity. It also found that the scale of these negative outcomes was generally much greater among those whose early mental health problems took the form of conduct problems rather than emotional difficulties. A particularly strong association was found between conduct problems in early life and the subsequent likelihood of involvement in criminal activity.

Genetic risk for conduct disorder predicts early-emerging conduct problems, particularly in conjunction with maltreatment (Jaffee et al, 2005). The knowledge of a family history of antisocial behaviour may therefore be used to help prioritise interventions. An absence of any family history of antisocial behaviour may be one indicator that a maltreated child is at relatively low risk for conduct problems, although it is possible that these children would be at high risk for other adverse outcomes like anxiety or depression.

Compared with children of mothers with depression only, the children of depressed and antisocial mothers had significantly higher levels of antisocial behaviour and rates of conduct disorder. They were at an elevated risk of experiencing multiple caregiving abuses, including physical maltreatment, high levels of maternal hostility, and exposure to domestic violence. Children of depressed and antisocial mothers constitute a group at extremely high risk for early-onset psychopathology (Kim-Cohen et al, 2006).

Mental health problems often begin early in life and cause disability when those affected would normally be the most productive, unlike most physical illnesses (Friedli and Parsonage, 2007). The scope for securing benefits by means of treatment, rather than prevention, appears to be distinctly limited. They go on to suggest that preventing conduct disorders in those children who are most disturbed would save around £150,000 (NZ\$275,000) per case in lifetime costs.

The economic burden of child maltreatment in the US has been estimated as the average lifetime cost per victim of nonfatal child maltreatment of US\$210,012 in 2010 dollars, and conclude that compared with other health problems the burden of child maltreatment is substantial, indicating the importance of prevention efforts (Fang et al, 2012). If we extrapolate this per child estimate just to the 27,000 substantiated cases of child maltreatment in New Zealand in 2010/11 (MSD, 2012) the total lifetime cost would be approximately NZ\$6.7 billion.

## LAW AND ORDER

### Antisocial behaviour and criminality

Internationally there has been a lot of emphasis on reducing criminality and imprisonment. One effective strategy for crime prevention is not creating criminals. Numerous studies identify some of the precursors of criminal behaviour evident in the early years and the features of their lives which either cause these outcomes or indicate a significantly raised likelihood of these outcomes.

Data from the Dunedin study (White et al, 1990) found that having preschool behaviour problems (identified in a number of ways) was the best predictor of antisocial outcome at ages 11 and 15. This research highlights the opportunities for early identification and intervention.

An English review (Sainsbury, 2009) found that around 80% of all criminal activity in the UK is attributable to people who had conduct problems in childhood and adolescence, including about 30% with Conduct Disorder. UK estimates suggest that the lifetime cost of crime committed by a single prolific offender is around £1.5 million (NZ\$2.75 million). They suggest that in the UK just 1% of the law and order budget would be sufficient to fund a comprehensive programme of pre-school support for 30% of all children born each year.

Childhood maltreatment is a universal risk factor for antisocial behaviour increasing later criminality by about 50% (Caspi et al, 2002). The earlier children experience harsh treatment, the more likely it is they will become aggressive. We note, however, the majority of maltreated males do not become delinquents or criminals.

Cohen & Piquero (2009) estimate the present value of saving a 14-year-old high risk juvenile from a life of crime to range from US\$2.6 to \$5.3 million (NZ\$3 – 6.2 million). Similarly, saving a high risk youth at birth would save society between US\$2.6 and \$4.4 million (NZ\$3 – 5.2 million).

Data from the Christchurch Health and Development Study has been used to identify trajectories to offending. Children are not condemned to this trajectory if circumstances change but they are at high risk. Each one of the risk factors below increases the probability of antisocial behaviour as a young adult by between four times and ten times. Together they increase risk by hundreds of times.

The key maternal risk factors are these, the mother:

- is young
- has little education
- is from a disadvantaged family of origin where she received little care and affection
- is, or has been, substance dependent
- is socially isolated and without family connections
- has a number of male partners in a serial fashion. (Fergusson et al 2000, in About Time).

Whilst people will always need health care thanks to accidents, infectious diseases etc regardless of early adversity, this is not so of the Corrections budget. If we are able to eliminate early adversity (including pre-natal exposure to alcohol, for example) we would expect to eliminate a significant proportion of the need for imprisonment, for example. Just 5% of our current spend in Vote Corrections – would provide around \$12,000 of services to wrap around each of the 5,000 most at risk families in New Zealand and their vulnerable children.

## EDUCATION

The extent to which unhelpful outcomes are interrelated was shown by Williams & McGee (1994) when they identified that reading disability at 9 years old predicated conduct disorder at age 15 in boys, findings that were independent of social disadvantage.

At the time of school entry, children who participate in early-education programmes are better prepared for school (West et al, 2000 in Duncan and Magnuson, 2004)

Heckman says "Early learning begets later learning and early success breeds later success, just as early failure breeds later failure". He goes on to add that a narrow focus on cognition ignores the full array of socially and economically valuable non-cognitive skills and motivation produced by schools, families and other institutions.

There is a large body of evidence regarding early adversity and lack of school success, however this is not the focus here.

## POVERTY

Apart from the obvious demands from the social welfare system, poverty is implicated in many poor outcomes. Again, many poor families bring up successful children, but many suffer compounding risk factors.

A recent US study, Fourth National Incidence Study of Child Abuse and Neglect (Sedlak et al, 2010) found that children in low socioeconomic status households (lowest 10%) experienced some type of maltreatment at more than 5 times the rate of other children; they were more than 3 times as likely to be abused and about 7 times as likely to be neglected.

Food security (or insecurity) is an issue of poverty. Zaslow et al (2008) found that food insecurity i.e. limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in socially acceptable ways worked indirectly through depression and parenting practices to influence security of attachment and mental proficiency in toddlerhood.

## LABOUR MARKET OUTCOMES

Caspi et al (1998) identified childhood and adolescent predictors of youth unemployment based on the Dunedin study as follows:

- human capital - lack of high-school qualifications, poor reading skills, low IQ scores, and limited parental resources significantly increased the risk of unemployment;
- social capital - growing up in a single-parent family, family conflict, and lack of attachment to school also increased the risk of unemployment;
- personal capital - children involved in antisocial behaviour had an increased risk of unemployment.

They observed that these predictors of unemployment reached back to early childhood suggesting that they began to shape outcomes years before these youths entered the work force.

Infometrics' David Grimmond presented the following graph in a speech for Every Child Counts entitled "Children and the Recession" in 2009. It amply illustrates that regardless of whether the economy is in recession or is buoyant, history shows that the unemployment rate is highest among those who have not completed schooling. The costs of unemployment are both personal and to society (by way of benefit payments and loss of productivity). We know that adverse early years experiences contribute to the likelihood of lack of completed schooling.

## KEY RESULT AREAS

We note that of the Government's 10 key result areas for 2013-15 the first eight are likely or very likely to be improved by appropriate interventions in the lives of disadvantaged children, although admittedly over a longer time frame.

### Reducing long-term welfare dependency

1. Reduce the number of people who have been on a working age benefit for more than 12 months.

### Supporting vulnerable children

2. Increase participation in early childhood education.
3. Increase infant immunisation rates and reduce the incidence of rheumatic fever.
4. Reduce the number of assaults on children.

### Boosting skills and employment

5. Increase the proportion of 18 year olds with NCEA level 2 or equivalent qualification.
6. Increase the proportion of 25-34 year olds with advanced trade qualifications, diplomas and degrees (at level 4 or above).

### Reducing crime

7. Reduce the rates of total crime, violent crime and youth crime.
8. Reduce reoffending.

(Source: [www.beehive.govt.nz/release/budget-focuses-better-public-service-results](http://www.beehive.govt.nz/release/budget-focuses-better-public-service-results))

## CONCLUSION

As a country we spend billions of dollars addressing the results of early childhood adversity. The research now provides compelling evidence regarding the long term ramifications of the construction of brain architecture in infants and children in the first few years. The early plasticity of the brain becomes its vulnerability. It also demonstrates the far reaching outcomes when those early years have been less than adequate in terms of the individual and society.

We know that the programmes that are in place to ameliorate those problems (prisoner rehabilitation, drug and alcohol programmes,

remedial support in school etc) are an expensive impost on the taxpayer yet we still provide them. A dollar invested in the early years however provides a very much higher return than a dollar invested later.

Interventions which reduce ongoing expenses to the health system will also have benefits in education, corrections, etc which accrue both to society and the individual.

Of course, intervention in the early years is not the only possible point of intervention, but it does provide the best return.

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Contact Brainwave for more information:

Telephone: 9 528 3981 Fax 9 528 3981 Email [info@brainwave.org.nz](mailto:info@brainwave.org.nz) Web: [www.brainwave.org.nz](http://www.brainwave.org.nz)