



**Brainwave™**

build a lifetime in the first three years

**Submission to Health Select Committee:  
Inquiry into preventing child abuse and improving  
children's health outcomes**

**Brainwave Trust Aotearoa**

**May 2012**

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## **1 Introduction**

- 1.1 Brainwave Trust Aotearoa is a registered charitable trust (CC40312), which disseminates information about the recent advances in understanding of brain development. Members include doctors, educationalists, academic, legal and business professionals.
- 1.2 Brainwave Trust's purpose is to raise public awareness about recent multidisciplinary research findings regarding brain development, and to educate everyone who has an impact on the early life of children about the important implications of this knowledge on children's physical, social, intellectual and emotional development. The organisation has no political or religious affiliations.

***One day every child in New Zealand will get the best start in life because parents and the whole community understand the impact that early experiences have on the developing brain and ultimately on the healthy development of our society.***

### *Brainwave Vision*

- 1.3 We make this submission to provide scientific evidence, from neuroscience as well as other biological and social sciences, in response to the first term of reference for the inquiry, namely, "to update knowledge of what factors influence best childhood outcomes from before conception to 3 years, and what are significant barriers." <sup>1</sup>
- 1.4 Brainwave Trust can provide a more detailed verbal presentation to further explain this material.
- 1.5 Some of the information provided in this submission was recently provided in Brainwave Trust's response<sup>2</sup> to the Government's *Green Paper for Vulnerable Children*, and is reused here with permission.

## **2 Early Brain Development**

- 2.1 Following a typical pregnancy, all a baby's organs, other than the brain, are fully formed at birth. The most rapid period of brain growth occurs in the period from birth to approximately three years of age.<sup>3</sup> To illustrate, the brain has reached 80 – 90% of its adult volume by 2 years of age.<sup>4</sup>
- 2.2 The human genome is now understood to contain a set of possibilities which are expressed differently depending upon the experiences encountered.<sup>5</sup>
- 2.3 Brain plasticity enables the experiences a child has to influence their brain development.<sup>6</sup> This plasticity can be a "double edged sword that leads to both adaptation and vulnerability."<sup>7</sup> For example, chronic stress during these formative years can have potentially lasting impacts on memory, learning, physical and mental health.<sup>8</sup> This can occur when the stress is ongoing or the child lacks adult emotional support.<sup>9</sup>
- 2.4 Infant brain development and the parent-infant relationship are interlinked. Brain growth and associated behavioural change is important to the development of the relationship, likewise the parent and the environment they create for the child has an impact on how the neurodevelopment proceeds.<sup>10</sup> The security of a child's attachment to their parents, for example, is a strong predictor of their later school performance.<sup>11</sup> It is also important for the development of the child's ability to regulate their emotions and relate to others.<sup>12</sup>
- 2.5 A secure attachment and associated emotional development is the basis for other aspects of development. The increasing over-emphasis on very young children's academic skills relative to other domains may be detrimental to children's overall outcomes.<sup>13</sup>
- 2.6 Because of the nature of brain development, early experiences (from pregnancy through to around 3-years-old) have a disproportionate effect on child outcomes compared with similar events occurring later in development.

### **3 Introduction to Risk and Protective Factors**

- 3.1 With regard to the terms of reference of this inquiry, factors contributing to “best childhood outcomes” are typically referred to in the literature as protective factors. “Significant barriers” to positive child outcomes can be conceptualised as risk factors. Most children are exposed to some combination of risk and protective factors.
- 3.2 Risk factors are conditions or events that occur before and increase the likelihood of a range of poor outcomes.<sup>14</sup> These outcomes may include learning and behavioural difficulties, substance use disorders, criminal offending and imprisonment, impaired physical and mental health, poor educational outcomes, and reduced employment opportunities.<sup>15</sup>
- 3.3 The term risk factor implies that rather than causing the outcome in a deterministic way, it increases the likelihood of that outcome.<sup>16</sup> The notion of multifinality<sup>17</sup> suggests that one factor will not lead to the same outcome for every individual. Risk factors operate cumulatively<sup>18</sup> and it is the number of risk factors rather than the presence of a particular risk factor that increases the likelihood of poor outcomes.<sup>19</sup>

***“Children are neither doomed nor protected by their own characteristics or the characteristics of their caregivers alone.”<sup>20</sup>***

- 3.4 Examples of risk factors include maternal depression, alcohol and other drug use in pregnancy, poverty, child maltreatment, emotional neglect, parental stress, and family violence.<sup>21</sup> These will be explained more fully in subsequent sections. None of these risks determine that a given child will experience a poor outcome, however each additional risk factor increases the likelihood of that occurrence.
- 3.5 Due to the interactions among risk factors, a reduction in some risks, even where other risks remain, may still make a substantial difference for children due to a reduced likelihood of synergistic effects.<sup>22</sup> Because risk and protective factors are usually on the same dimension, increasing protective factors effectively reduces risk.<sup>23</sup>
- 3.6 Risk and protective factors may exist at the level of the child, parent, family, community, and wider influences, such as the political level.<sup>24</sup>
- 3.7 Protective factors lead to a higher likelihood of positive outcomes.<sup>25</sup> The cumulative effect of protective factors is important, as is the balance between the number of risk versus protective factors a child is exposed to.<sup>26</sup> In other words, the more protective factors and the fewer risk factors a child is exposed to, the greater the likelihood of positive outcomes for that child.

## 4 Risk Factors

### 4.1 Substance Use in Pregnancy

- 4.1.1 Fetal Alcohol Syndrome (FAS) is the most common known cause of intellectual disability which affects between 1 and 7 per 1000 live births. Children with FAS have altered brain structure, cognitive impairments and behaviour problems, deficits in learning, memory and executive function, hyperactivity, impulsivity, inattention, and poor social and communication skills. Many develop ADHD (Attention Deficit/Hyperactivity Disorder).<sup>27</sup>
- 4.1.2 There are complex interactions between prenatal alcohol use and the postnatal environment, particularly if the parent is abusing alcohol. Various mechanisms affect outcomes including direct prenatal effects, genetic effects, and cumulative social risks. Some children may be more affected than others, particularly when early risk is compounded by postnatal environmental risk.<sup>28</sup>
- 4.1.3 Recent NZ data, from the Growing Up in New Zealand longitudinal study, indicate that 65% of women avoided alcohol at some time during their pregnancy, with 52% reporting avoiding alcohol throughout their pregnancy. This indicates that almost half of pregnant NZ women are consuming some alcohol during pregnancy.<sup>29</sup>
- 4.1.4 Children whose mothers smoked during pregnancy had lower scores on cognitive tests. The effects were found after adjusting for a number of variables including parental educational level, social class, and marital status, suggesting that while smoking may be considered a marker for social disadvantage, it also has a biological effect.<sup>30</sup>
- 4.1.5 Smoking during pregnancy has been associated with toddlers having higher levels of restless or disruptive behaviour and more externalising behaviour than children whose mothers had not smoked during pregnancy.<sup>31</sup> Children of smokers are more likely to have a smaller head circumference at birth and lasting alterations to brain structure that may well continue through adolescence and into adulthood.<sup>32</sup> Smoking during pregnancy is a recognised major risk factor for SIDS (Sudden Infant Death Syndrome).<sup>33</sup>
- 4.1.6 Cocaine use by mother in pregnancy is associated with modest developmental changes in the early years, but increased difficulty with attention, hyperactivity and mood control as children enter teenage years. It is not only the chemicals themselves that can contribute to poorer development, but also elevated stress hormones experienced post-birth, when children lack stable and supportive adult caregivers.<sup>34</sup> Further long term implications include adverse effects on intelligence, executive functioning, impulse control, attention, language, and, internalising and externalising behaviour disorders.<sup>35</sup> There is also evidence for a dose-response relationship, especially in relation to behaviour problems. In other words, the more cocaine a child is exposed to the greater the adverse effects are likely to be.

4.1.7 Methamphetamine ("P") is the second most widely used recreational drug in NZ.<sup>36</sup> Studies on the effects of this drug are in their infancy, however, recent research from NZ and the US found unique effects of methamphetamine on newborn neurobehaviour, including under-arousal, poorer movement quality, low tone and increased stress. Notably, these were observed before postnatal environment factors had exerted any influence. Further, NZ's methamphetamine supply is thought to be of higher purity than that of the US, suggesting the potential for greater effects following prenatal exposure.<sup>37</sup>

## 4.2 Stress

4.2.1 Significant maternal stress during pregnancy can affect the developing foetal stress system and may alter the expression of genes involved in brain development. Prenatal maternal stress and anxiety can have long lasting effects on children's physical and psychological development<sup>38</sup>, however, normative stress levels of 'daily hassles' are not related to later difficulties.<sup>39</sup>

4.2.2 Potential adverse effects include increased behavioural problems at preschool and school age, low birth weight or small for gestational age, prematurity, smaller head circumference, increased basal hypothalamic-pituitary-adrenal (HPA) axis activity throughout childhood, ADHD, sleep disturbances, depression, drug abuse, mood and anxiety disorders, and poorer cognitive outcomes.<sup>40</sup>

4.2.3 There are likely to be gene-environment interactions such that the effects of prenatal stress are more evident in some children, who have a genetic susceptibility, than others.<sup>41</sup>

4.2.4 Postnatally, stressful events that are ongoing or those where the child lacks adequate adult support may have a lasting effect on their brain development. This type of stress can originate from within the home (e.g. family violence), or from the external environment (e.g. Christchurch earthquakes). Such situations are referred to as toxic stress. Due to the plasticity of the infant's brain, stress that is extreme or repeated may be especially harmful during infancy. Ongoing high levels of cortisol or corticotropin-releasing hormone (CRH) can damage the hippocampus.<sup>42</sup> There are several possible mechanisms through which elevated levels of stress chemicals can impact brain development including loss of neurons, delays in myelination, and abnormalities in pruning.<sup>43</sup>

4.2.5 Chronic stress may be as much about repeated or prolonged anticipation of possible unpleasant events, as about directly experiencing them.<sup>44</sup>

4.2.6 In infancy, parental unavailability results in similar physiological reactions to threat events,<sup>45</sup> for example, being consistently ignored when crying can activate the baby's stress response, potentially damaging the neurotransmitter systems that are still developing.

***"Probably the most stressful experience of all for a baby or toddler is to be separated from his or her mother or caregiver."***<sup>46</sup>

### 4.3 Poverty

4.3.1 Family factors affecting child development include parents' socioeconomic status (SES).<sup>47</sup>

***"Poverty has substantial effects on multiple aspects of children's development"***<sup>48</sup>

4.3.2 Poverty impacts many aspects of child development, including cognitive, health, and social-emotional development.<sup>49</sup> It is associated with an increased risk of behavioural disorders, including Conduct Disorder and Oppositional Defiant Disorder,<sup>50</sup> and with insecure attachment.<sup>51</sup>

4.3.3 Poverty is associated with higher rates of child maltreatment, and parents in poverty tend to be less responsive to their infant's cues, provide less stable caregiving, and portray a more negative view of the world.<sup>52</sup>

4.3.4 Educational achievement can be impacted by poverty, as while poor children who are academically able may start well at school, they are very frequently overtaken by less able children from higher SES backgrounds.<sup>53</sup>

4.3.5 The relationship between poverty and child outcomes is not straight forward. Distal factors, including poverty, and proximal factors, such as family relationships, interact with and affect each other.<sup>54</sup> Research suggests that factors such as poverty influence child outcomes through their impact on maternal behaviour.<sup>55</sup> For example, there is a positive correlation between higher parental SES, and levels of maternal affection.<sup>56</sup>

***"Successful interventions in high-risk families may need to address socioeconomic and psychosocial risks as well as maternal sensitivity and attachment"***<sup>57</sup>

#### 4.4 Parental Depression

- 4.4.1 Children of depressed mothers are more likely to have a variety of behaviour problems and other psychopathology.<sup>58</sup> These include depression, ADHD, Conduct Disorder, intellectual deficits, delayed language development, anxiety disorders and later substance abuse.<sup>59</sup>
- 4.4.2 The effects are heightened when the mother's depression has been chronic.<sup>60</sup> However, parental depression occurring at times that interferes with child development, such as attachment development, even though it later remits, may lead to increased emotional and behavioural difficulties later in life.<sup>61</sup> One of the mechanisms may be the tendency of depressed mothers to be more withdrawn in interactions with their children.<sup>62</sup>
- 4.4.3 The effects are increased when depression occurs alongside other risk factors including lower social support, reduced marital satisfaction, and more negative life events.<sup>63</sup>
- 4.4.4 Recent NZ data found that when their children were 9 months-old, 11% of mothers met criteria for probable depressive symptoms.<sup>64</sup>
- 4.4.5 Paternal depression is associated with greater conflict between fathers and their children, contributing to increased externalising and internalising behaviour difficulties.<sup>65</sup> In men, depression is associated with an increased risk of violence and suicide, and effects on the marital relationship, so may have a particularly negative impact on their family.<sup>66</sup>

#### 4.5 Family Conflict and Violence

- 4.5.1 Most families experience some level of conflict, however, when this is unresolved, increases in hostility, or creates disengagement, children's outcomes can be adversely affected.<sup>67</sup>
- 4.5.2 Interparental conflict affects child adjustment in part by altering parents' childrearing practises. Parents who are preoccupied, distressed or frustrated, are less able to be emotionally available, warm, and supportive of their children. This increases the likelihood of behavioural, social and emotional difficulties in their children.<sup>68</sup>
- 4.5.3 Children who witness marital violence have more than double the rate of clinically significant behaviour problems than comparison children; including both internalizing behaviour problems (e.g. depression, withdrawal) and externalizing behaviour problems (e.g. aggression, defiance, non-compliance). Such children are also at greater risk of psychological, academic, emotional and social problems. The impact may be greater in younger children than in older children.<sup>69</sup>
- 4.5.4 Difficulties of children who have witnessed domestic violence are similar to those for directly abused children. Children who experience physical abuse as well as witnessing violence do not have significantly worse outcomes than those who witness violence alone.<sup>70</sup>

- 4.5.5 Such children and their mothers are frequently socially isolated, likely to have higher levels of stress, more residential moves, lower parental education, and increased alcohol-related problems, which further compound the child's difficulties.<sup>71</sup>
- 4.5.6 Between 4 and 7 months of age, infants develop voice-sensitive brain systems, and respond differentially to happy versus angry voices. This suggests young babies and the wiring of their brains can be significantly affected by happy versus angry homes.<sup>72</sup>

#### 4.6 Emotional Neglect

- 4.6.1 Emotional neglect (EN) occurs when parents are emotionally unavailable to their child and unresponsive to their emotional and attachment needs, despite perhaps adequately meeting other needs such as for nutrition and medical attention. Nonorganic failure to thrive may be the most widely recognised form of EN in which, despite adequate nutrition, children do not develop physically.<sup>73</sup>
- 4.6.2 EN can have a greater adverse impact on children's outcomes than physical abuse or neglect, particularly when it occurs during the first two years of life. These effects can continue into adolescence and may include higher levels of aggression, delinquency and social problems.<sup>74</sup> Children who have experienced chronic, early neglect are likely to have brains that are smaller, with fewer cells, fewer connections between cells, and a corresponding decrease in complexity.<sup>75</sup>
- 4.6.3 Most neglect results from "isolated, overwhelmed, ignorant or distressed caregivers" and care-giving beliefs which are not developmentally informed,<sup>76</sup> and occurs across the socio-economic spectrum (SES).

## **5 Protective Factors**

### **5.1 Secure Attachment**

- 5.1.1 The key protective factor involves the child developing a secure attachment to their parent(s) during the early years.<sup>77</sup> Whilst nearly all infants become attached to their parents, not all become securely attached.<sup>78</sup> The security of this attachment depends upon both the quantity and quality of a parent's interaction with their child.<sup>79</sup> The security of the child's attachment can affect their emotional, psychological and cognitive development, with developmental and behavioural problems often having their origins in disturbances of this relationship.<sup>80</sup>
- 5.1.2 A necessary ingredient for the development of attachment security is the sensitivity of the mother towards her child.<sup>81</sup> While this sensitivity develops naturally for some, others require support. The nature of the parents' emotional connection to their child is crucial.<sup>82</sup>
- 5.1.3 Contrary to popular messages over-emphasising quality time with children, much research stresses the importance of the amount or quantity of time that parents spend with their children.<sup>83</sup> Perry, in discussing the time required to develop attachment stated that "in childhood quantity does matter."<sup>84</sup>
- 5.1.4 The importance of the amount of time spent with the young is further supported by animal studies. For example, the more time rat pups experienced nurturing behaviour from their mothers, the greater their resilience to later stress, and the more interested they were in exploring novel environments,<sup>85</sup> a factor important for learning.
- 5.1.5 The concept of threat usually refers to likely physical harm to oneself or another, however in infancy the caregiver's affect and availability have a greater impact on the infant's perception of threat than the actual degree of threat inherent in a particular event. In infancy, threat includes that of separation from the caregiver and of not having one's distress responded to.<sup>86</sup>
- 5.1.6 The relationships experienced by young children affect all aspects of their development, including emotional, social and intellectual development. The stability and quality of their early relationships influence a number of developmental outcomes including learning motivation, mental health, academic achievement, and ability to control aggression.<sup>87</sup> Secure attachment also enhances a child's resilience to later stress.<sup>88</sup>

## 5.2 Breast feeding

- 5.2.1 A number of studies have found a strong positive relationship between breastfeeding and child cognitive development.<sup>89</sup> Furthermore, a dose-response relationship has been found, in other words, those breastfed for longer tended to have larger gains in cognitive development.<sup>90</sup>
- 5.2.2 Breastfeeding has health benefits for the child, for example, breastfeeding for more than three months modified the risk for asthma when the mother had smoked prenatally or when the child had recurrent lower respiratory tract infections. In other words, breastfeeding served as a protective factor when these risks were present.<sup>91</sup>
- 5.2.3 The benefits of breastfeeding may be due to: the interactions involved in breastfeeding (likely to be more frequent and longer maternal-infant contact) contributing to a stronger attachment; the nutritional components of breast-milk, which has a higher concentration of essential long-chain polyunsaturated fatty acids than formula<sup>92</sup>; or, a combination of the two.
- 5.2.4 Breastfeeding has been associated with increased maternal sensitivity, which is an important component of secure attachment formation, and with greater amounts of emotional care.<sup>93</sup> It has a protective effect for children whose mothers are depressed in that it has been associated with more positive mother-child interactions.<sup>94</sup>
- 5.2.5 Current NZ data (Growing Up in New Zealand) indicates that 48% of infants are still being breastfed at 9-months-old, and for those who were not, the median age when breastfeeding ceased was four months-old.<sup>95</sup> This contrasts with the recommendations of the World Health Organisation (WHO), which recommends exclusive breastfeeding for six months and continued breastfeeding until at least two years of age.<sup>96</sup>
- 5.2.6 It is important to note that while breastfeeding has been associated with increased maternal sensitivity, it does not predict a secure attachment.<sup>97</sup> This is predicted by the quality of maternal-child interaction, which includes, among other factors, how babies are fed, not just what they are fed.<sup>98</sup>

## 6 Early Childhood Education

- 6.1 Much discussion regarding a positive start for infants and young children has erroneously equated this with early childhood education (ECE) for all. Therefore this section highlights relevant research differentiating between situations in which ECE may be beneficial (a protective factor), and those in which it may be harmful (a risk factor).
- 6.2 Research carried out in this area has often looked at outcomes for children who attended when they were 3-4 years old, including the Perry Preschool project, Chicago Child Parent Centres (CPCs), and Head Start.<sup>99</sup> Positive outcomes from Perry Preschool include: improved behaviour, higher earnings, improved health, less reliance on welfare, fewer arrests, and more formal education.<sup>100</sup> Children who had participated in CPCs were less likely to require special education input, had fewer behaviour difficulties, and reduced juvenile delinquency and adult offending.<sup>101</sup> Studies of Head Start found improved educational outcomes for white children, and higher earnings in their early twenties; and reduced criminal charges and convictions for African American participants.<sup>102</sup>
- 6.3 The needs of babies, toddlers, and preschoolers are in some important ways significantly different from each other. This distinction is not always made when describing the potential outcomes of access to ECE. Benefits for three or four-year-olds do not necessarily equate to benefits for one-year-olds for instance, and in many cases may in fact be harmful.

***There is a chronic overestimation of the benefit of early childhood institutions and a chronic underestimation of the potential of well-guided parents, even disadvantaged ones.”<sup>103</sup>***

- 6.4 Results of the American Perry Preschool study, indicating long term cognitive benefits, are frequently used to argue for ECE being extended to all children.<sup>104</sup> However, effective centre-based interventions contain specific elements to address childhood disadvantage, including weekly family support, and their results cannot be extrapolated to early childhood education in general.<sup>105</sup>
- 6.5 The Perry Preschool project differs from mainstream ECE in NZ in a number of significant ways which preclude the results being used to generalise across all age groups and durations of ECE. First, the intervention was for 3 & 4 year olds, for 2.5 hours per day, eight months of the year. In other words, in terms of 'quantity' it was similar to NZ's now disappearing traditional Kindergarten model. Secondly, it included weekly home visits of one and a half hours duration to support mothers in their parenting.<sup>106</sup> Third, all teachers had child development training and Masters Degrees,<sup>107</sup> which cannot be equated with the training levels of the majority of ECE staff in NZ. Finally, the children attending were African American, from low income families, and had IQ scores between 70 and 85.<sup>108</sup> i

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<sup>ii</sup> An IQ score of 100 (range 90-109) is average, 80-89 low average intelligence, and 70-79 borderline impaired or delayed (Sattler, 2008).

- 6.6 Starting ECE early, and attending for long hours, are associated with greater anxious or antisocial behaviour, and regardless of quality, ECE in the first three years increases the likelihood of externalising behaviour problems.<sup>109</sup> The risks associated with current ECE usage are “significantly multiplied by their widespread prevalence,”<sup>110</sup> and are comparable to the effects of poverty on child development.<sup>111</sup>
- 6.7 In terms of the cognitive benefits of ECE, these are greater for those beginning between two and three years of age; prior to this there are no cognitive benefits, and there are risks in terms of healthy social and emotional development, which are greater the younger the child.<sup>112</sup>

**“There is a broad consensus that child care that is ‘too early and for too long’ can be damaging”<sup>113</sup>**

- 6.8 Research regarding the introduction of universal state-funded childcare in the Canadian province of Quebec, which was introduced in the late 1990s, found “consistent and robust evidence of negative effects” on a variety of parent and child outcomes.<sup>114</sup>
- 6.9 In recent years NZ has seen the greatest rate of increase in under-two-year-olds in ECE, who are attending for greater hours each day and a greater part of the week.<sup>115</sup> Participation rates for this age increased by 36% between 2000 and 2009.<sup>116</sup> All day services have seen the largest growth, from 42% of enrolments in 1998 to 60% in 2005.<sup>117</sup> By 9 months-of-age, 35% of the Growing Up in NZ cohort were in non-parental care, for a median duration of 20 hours per week.<sup>118</sup>
- 6.10 When infants and toddlers are in non-parental care, this should be of high quality. This concept of quality refers to trained staff, high ratios of adults to children, an understanding of the emotional needs of this age group, small numbers on site,<sup>119</sup> and the provision of a primary caregiver whenever possible.<sup>120</sup> Such best practice is often far removed from common practice.<sup>121</sup>
- 6.11 Internationally, NZ is ranked 28 out of 30 OECD countries in terms of outcomes for children,<sup>122</sup> yet we have the 8<sup>th</sup> largest proportion of under-3-year-olds in licensed childcare, out of 24 nations.<sup>123</sup> If attending childcare were the solution, NZ would be expected to be performing significantly better internationally than it currently does.

## 7 A Preventative Approach

- 7.1 Research indicates prevention of poor outcomes for children is more effective than later treatment as difficulties may increase in severity over time.<sup>124</sup> Prevention is also more cost-effective than later remediation.<sup>125</sup>
- 7.2 It is acknowledged that there is likely to be a temporary funding blip, and take time, before the full benefits of effective prevention and early intervention approaches become apparent. However, if effective preventative measures are well implemented and given ongoing support, future savings across many areas of Government expenditure are probable.
- 7.3 Parenting interventions can be helpful in reducing the likelihood of parents maltreating their child and in improving a variety of child outcomes.<sup>126</sup> These include but are not limited to parenting interventions which have been found successful overseas, such as Triple P (Positive Parenting Program),<sup>127</sup> Incredible Years,<sup>128</sup> Parent Child Interaction Training,<sup>129</sup> and Watch, Wait and Wonder.<sup>130</sup>
- 7.4 Models of home visiting programmes with evidence supporting their efficacy include the Nurse Family Partnership,<sup>131</sup> and Early Start,<sup>132</sup> which was developed and is operating in Christchurch. It is noted that overall however, home visiting models have failed to produce strong support for their efficacy.<sup>133</sup>
- 7.5 The benefits of programmes such as Nurse Family Partnership were greatest for those experiencing the greatest disadvantage, and include 80% reduced rates of abuse and neglect, reduced rates of emotional and behavioural disorders, less reliance on governmental support, and higher academic functioning.<sup>134</sup>
- 7.6 Programmes that are ineffective ought to be discontinued<sup>135</sup> and limited resources directed to more effective interventions. However, an important distinction is to be made between programmes which are ineffective (or even potentially harmful) and programmes which have not yet demonstrated their effectiveness, perhaps because their limited resources have been focussed on service delivery rather than evaluation. In such situations, support to facilitate evaluation is recommended.
- 7.7 Improved child outcomes are important in their own right for the individual child, but also have wider societal implications. These include reduced criminal behaviour<sup>136</sup> as well as reduced health and welfare costs; the maximisation of otherwise lost or wasted potential; and preventing the potential intergenerational transmission of poor outcomes from one child, to multiple children in the next generation.<sup>137</sup>
- 7.8 Preventative interventions occur at varying levels. At the universal level the intervention is available to the entire population regardless of perceived risk, whilst targeted interventions are provided for those at increased risk.<sup>138</sup> The most effective solution is likely to involve a range of interventions, at differing levels of intensity, sometimes referred to as a "cascading service model".<sup>139</sup> Parenting support must be provided at the appropriate intensity for the risks observed, in order to be effective.<sup>140</sup> This increases the likely effectiveness of interventions,

whilst also reducing any wasted resources from providing intensive interventions where they are not required. For some children one intervention will be sufficient to contribute to positive outcomes, others may require ongoing support to deal with the multiple risks they face, which needs to occur in a co-ordinated manner.

- 7.9 To this end we propose two broad aspects to addressing the issues; first, a much more proactive preventative approach that is supportive of all infants and their parents - to reduce the overall level of vulnerability at a population level; and, secondly, more timely and effective identification and intervention for those children at heightened risk, and their parents, family/whanau.
- 7.10 The complexity of the interactions between multiple potential risk and protective factors provides many "avenues of intervention to facilitate the healthy development of infants and their families."<sup>141</sup>

## **8 Conclusion**

- 8.1 Research from multiple disciplines indicates the importance of a positive start during pregnancy and the early years in order for children to have healthy outcomes across the life span. Central to this positive start is the need for all infants and children to have the opportunity to develop a secure attachment with their parents as a foundation for their future development. A range of Government actions are required to truly acknowledge and support the primacy of this parent-child relationship.
- 8.2 Attempts to improve outcomes for NZ children require an accurate, informed understanding of the known risk and protective factors and an awareness of the complexity of interactions between them. Equally, proposed interventions to address these should have a sound evidence base and provision should be made for evaluating the effectiveness of promising locally developed interventions.

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## 10 End Notes

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- <sup>1</sup> Media release, available at <http://www.nzfvc.org.nz/node/571>
- <sup>2</sup> Available at <http://www.brainwave.org.nz/wp-content/uploads//Brainwave-Trust-Green-Paper-Submission-Final.pdf>
- <sup>3</sup> Rutter, 2011
- <sup>4</sup> Knickmeyer, Gouillard, Kang, & et al, 2008
- <sup>5</sup> Sameroff, 2009
- <sup>6</sup> Parsons, Young, Murray, Stein, & Kringelbach, 2010
- <sup>7</sup> Shonkoff & Phillips, 2000
- <sup>8</sup> Twardosz & Lutzker, 2010
- <sup>9</sup> National Scientific Council on the Developing Child, 2005
- <sup>10</sup> Parsons et al., 2010
- <sup>11</sup> Moss, St-Laurent, Dubois-Comtois, & Cyr, 2005
- <sup>12</sup> Schore, 2000
- <sup>13</sup> Clarke & Campbell, 1998
- <sup>14</sup> Loeber, Burke, & Pardini, 2009; Lupien, McEwen, Gunner, & Heim, 2009
- <sup>15</sup> Ministry of Social Development, 2011
- <sup>16</sup> Rutter, 2006; Sameroff, 2000
- <sup>17</sup> Cicchetti & Rogosch, 1996
- <sup>18</sup> Boden, Fergusson, & Horwood, 2010; Hanson & Carta, 1996; Sameroff, 2000
- <sup>19</sup> Belsky & Fearon, 2002; Egeland, 2009; Gutman, Sameroff, & Cole, 2003; Loeber et al., 2009; Nelson, Stage, Duppong-Hurley, Synhorst, & Epstein, 2007; Sameroff, Gutman, & Peck, 2003; Watamura, Phillips, Morrissey, McCartney, & Bub, 2011
- <sup>20</sup> Sameroff, 2009
- <sup>21</sup> Boden et al., 2010; Dawson et al., 2003; Egeland, 2009; Graham-Bermann, Gruber, Howell, & Girz, 2009; Niccols, 2007; Owens & Shaw, 2003; Sameroff et al., 2003; Williams, Mitchell, & Taylor, 2002; Yates, Obradovic, & Egeland, 2010
- <sup>22</sup> Rutter, 2011
- <sup>23</sup> Sameroff et al., 2003
- <sup>24</sup> Sameroff, 2010
- <sup>25</sup> Gutman et al., 2003; Loeber et al., 2009; Owens & Shaw, 2003
- <sup>26</sup> Cicchetti & Valentine 2006 cited by Egeland, 2009
- <sup>27</sup> Boris, 2009; Niccols, 2007

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- <sup>28</sup> Boris, 2009
- <sup>29</sup> Morton et al., 2010
- <sup>30</sup> Julvez et al., 2007
- <sup>31</sup> Gutteling et al., 2005
- <sup>32</sup> Derauf, Kekatpure, Neyzi, Lester, & Kosofsky, 2009
- <sup>33</sup> Lester, Andreozzi, & Appiah, 2004; Lester & LaGasse, 2010; Williams et al., 2002
- <sup>34</sup> National Scientific Council on the Developing Child, 2006
- <sup>35</sup> Derauf et al., 2009; Lester & LaGasse, 2010
- <sup>36</sup> Wilkins & Sweetsur, 2008, cited by LaGasse et al., 2011
- <sup>37</sup> LaGasse et al., 2011
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