the Lowitja INSTITUTE

Australia's National Institute for Aboriginal and Torres Strait Islander Health Research

Incorporating the Cooperative Research Centre for Aboriginal and Torres Strait Islander Health

Stewardship Dialogues in Aboriginal and Torres Strait Islander Health: Education and early years

The two papers presented here were commissioned as part of the Stewardship Dialogues for Aboriginal and Torres Strait Islander Health, a project of the Lowitja Institute. The Dialogues were established to test whether an open exploration of the underlying barriers to better progress in Aboriginal health policy and programs could generate new ways to approach some of the 'wicked problems' of policy and implementation. The Dialogue project was built on experience at the Cooperative Research Centre for Aboriginal Health, now incorporated into the Lowitja Institute, where multiple stakeholder groups with different perspectives and different ways of knowing and working had successfully developed innovative research projects.

Two Dialogues were held in 2013 – one in July and one in October. Participants included Indigenous health leaders, people with policy and/or public administration experience and influence, and people with health system knowledge and experience. The Dialogues developed a statement of principles for effective conversations in policy and program development processes for Aboriginal and Torres Strait Islander health, and three proposals for national action.

Dialogue participants identified that education and early years interventions, implemented in collaboration with Aboriginal and Torres Strait Islander communities and properly adapted to their settings, held the potential to produce really significant long-term effects on health and wellbeing. However, as always, poor implementation without collaboration is unlikely to realise these benefits.

FOREWORD

The experience of all children in their early years is critical to their future lives. Effective nurturing can influence brain development, maximise ability to learn, and enhance the ability of children to develop healthy ways of living in the world as adults. This understanding has led to the development of a range of programs to support child development, including programs with a focus on parenting, on education of children, and on health and wellbeing.

A focus on the early years does not mean there should be a reduced focus on the later years of childhood as what happens in these years also makes a difference in future life chances. This means that things like engagement, retention and achievement in education are also important, as is support during times of life transitions.

For many children in Australia, including those who live in communities that have been severely disrupted by colonisation and its consequences, and those who experience disadvantage associated with (often intersecting) factors like poverty, multigenerational unemployment and poor access to educational and other opportunities, such programs are likely to offer significant benefits. For some Aboriginal children, a focus on the early years will be important not only in addressing early childhood inequities in health and wellbeing, but also in reducing their life-long consequences.

There is less knowledge about the effectiveness of particular programs in Aboriginal communities or evaluation of the effect of adaptation of such programs to specific community contexts. It might also be that further work is required to identify the types of community priorities and cultural factors that are important in shaping programs and in describing the ways in which communities would like success to be measured.

The first paper presented here provides a concise summary of the evidence about why the early years are important. The second describes what is known about the effectiveness of different programs, and similarly to the recent paper from the Clearing the Gap Clearinghouse, focuses on programs delivered in the context of child and maternal health, early learning and positive parenting, as well as highlighting existing evidence about their implementation in Aboriginal communities.[4] To support the selection of programs for implementation, this paper includes a short review in which each of the programs is rated for the level of evidence and the effect size. [Please note, this paper is currently being commissioned.]

As early years interventions can make such a big difference in the lives of children, and to their future health and wellbeing outcomes, it is critical that those programs most likely to produce the largest benefit are adopted in any widespread implementation effort (for example, across a state/territory or nation).

In conclusion, there is an important opportunity to make a real difference for Aboriginal children, families and communities. This would require:

- a committed and careful process of implementation of early childhood programs nationally, based on interventions that are well supported by evidence of benefit
- a respectful process of engagement and tailoring offered to each Aboriginal community
- sufficient flexibility to incorporate local priorities and build on local strengths while retaining the basic logic of the program, and
- good data collection and sound evaluation to both inform the progressive implementation of the program and to generate good knowledge of its value.

We recommend that governments and bodies with expertise in this area take up this opportunity as a priority.

The project gratefully acknowledges the generosity and contribution of the participants (in alphabetical order), including Donna AhChee, Professor Kerry Arabena (one session), David De Carvalho, Alan Bansemer, Professor Gabriele Bammer, Jeff Harmer, Professor Judith Healy, Dr Mukesh Haikerwal, Dr Genevieve Howse, Professor Richard Larkins, Professor Carmen Lawrence, Dr Tamara McKean (one session), Lesley Podesta, Mick Reid, Joy Savage, Ernie Stringer, Professor Peter Sutton, Professor Judith Whitworth, Dr Mark Wenitong, Professor Ted Wilkes and of Mr Mick Gooda, Chair and Dr Norman Swan, Facilitator. The project team were Professor Ian Anderson, Professor Judith Dwyer, Kate Silburn and Rhondda Davis.

[4] In the time since these two papers were first drafted, a paper reviewing the evidence for early childhood parenting, education and health intervention programs for Indigenous children and families has been published by the Closing the Gap Clearinghouse (see reference above).

the Lowitja INSTITUTE
Australia's National Institute for Aboriginal and Torres Strait Islander Health Research

ARACY
Australian Research Alliance for Children & Youth
Collaboration • Evidence • Prevention

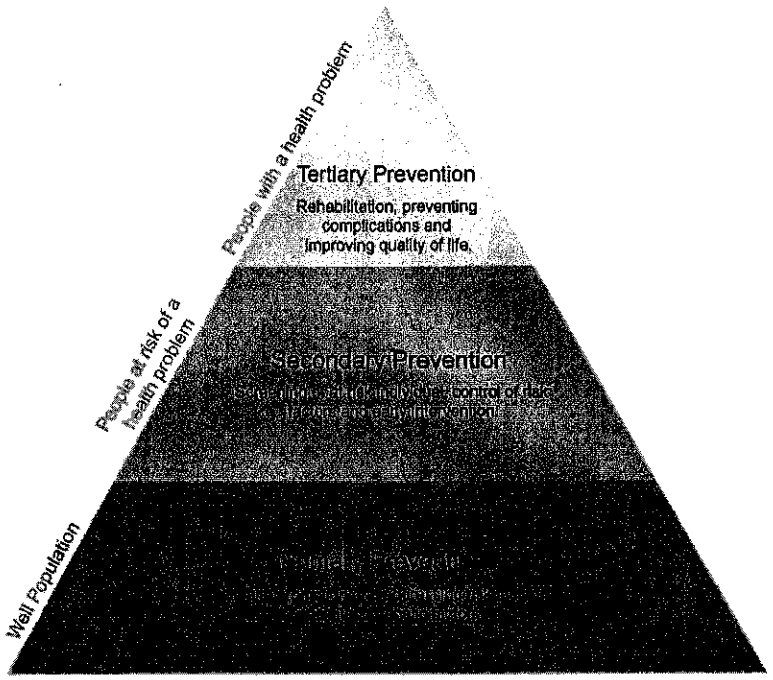
Synopsis of effective interventions to promote a healthy start in life

Dr Stacey Fox and Dr Lance Emerson, ARACY

September 2013

The early childhood years play a critical role in shaping longer-term health, learning and wellbeing outcomes (see paper 'The importance of a healthy start to life: synopsis of evidence'). The cost-benefit and long-term impact of prevention and early intervention initiatives are widely recognised,1 with interventions falling into three main categories: primary, secondary and tertiary strategies, as summarised in Figure 1.

Figure 1 – The Prevention Continuum[2]



In an early childhood context, the most effective interventions for promoting a healthy start in life is through **primary** and to a lesser extent **secondary prevention**, and particularly in three broad categories: maternal and child health (MCH) interventions; early learning interventions; and positive parenting interventions. To maximise their effectiveness, moreover, these interventions must be embedded in a coherent and coordinated service system that is responsive to the developmental pathways identified in the previous paper.

This paper provides a selection of interventions under these three intervention areas, chosen due to their strength of evidence and potential applicability to Australia. Note that a full

2b) Sustained home visiting (perinatal and into early years)

There is solid evidence that well-designed sustained home visiting programs are an effective strategy for delivering a range of health, parenting and early learning services to families requiring additional support.[7] Sustained home visiting may be effective in influencing a wide range of parental and child wellbeing outcomes, including reduced substance use among mothers, healthy gestation and birth weight, increased and sustained levels of breastfeeding, and maternal mental health. Programs of note are:

- Australian Nurse Family Partnership (ANFP) Program: NFP is designed to improve prenatal health and outcomes, improve child health and development, and improve families' economic self-sufficiency and/or maternal life course development. Based at the University of Colorado, this model is highly effective for young, first-time mothers who present early in pregnancy. It has been piloted in three sites in the Northern Territory, with the formative evaluation identifying implementation challenges but early signs that the model was acceptable to families.[8] No outcomes evaluation on NFP has been undertaken in Australia as yet.
- **right@home**: An Australian-developed program built on the Maternal and Early Childhood Sustained Home-Visiting (MECSH) model, currently undergoing a second large scale randomised controlled trial. Right@home focuses on building effective relationships, parent-craft skill development, parental attachment and responsivity and fostering a positive home learning environment.
- **Bulundidi Guduga**: An adaptation of the MECSH/right@home program for Aboriginal families and children, currently undergoing a clinical trial, delivered through the universal maternal and child health system and in collaboration with the local Aboriginal community. Aboriginal health workers are part of an inter-disciplinary team that works with families over two years and targets the risk-factors of particular concern to the community.

2. Early learning interventions

Evidence demonstrates the importance of child attendance and participation in a quality pre-school environment, and the effectiveness of this on short, medium and long-term health and development outcomes. Similarly, a positive, engaging home learning environment is a strong predictor of good outcomes and can help ameliorate the impacts of poverty and disadvantage.

2a) Promoting a positive home learning environment

- Home Instruction for Parents of Preschool Youngsters (HIPPY): A home visiting program that focuses on parent-involved early learning and helping parents prepare their children for school. Significant positive impacts were found across a number of important developmental domains and spheres of influence, including the child, the parent, the home learning environment and parents' social connectedness and inclusion.[9] HIPPY has been implemented in a number of Aboriginal communities and qualitatively evaluation suggests that it is promising.
- **Parents as Teachers (PAT):** Trained parent educators visit homes to deliver lessons and materials about child developmental stages and needs, as well as conducting basic health and development checks. Evaluation findings indicate that this program leads to parents more involved in their child's schooling and engaged in language and literacy promotion. Children are shown to have more advanced language and problem-solving skills, higher social development and readiness for school.
- **It Takes Two to Talk: The Hanen Program for Parents:** A program that aims to increase the child's social communication skills and language development by enhancing the quality of

of challenges with implementation fidelity and the 'cultural fit' of programs that may reflect Western norms of parenting and child rearing.

- **Triple P Positive Parenting Program**: Aims to improve child behaviour problems, reduce dysfunctional parenting practices and increase use of appropriate discipline and positive parenting strategies as well as increase parental confidence and adjustment. Parents receiving the intervention reported significantly lower levels of targeted child behaviour problems, dysfunctional parenting and reduced parental anxiety and stress in comparison to wait-listed parents at post-assessment.[14] A small randomised controlled trial of Indigenous Group Triple P found some positive changes in both child behaviour and parenting style but a sample size small means results are not conclusive.[15] It is important to note that a recent systematic review and meta-analysis has raised questions about the current evidence base for Triple P, on the basis of small sample sizes and potential conflicts of interest.[16]
- **Parent Child Interaction Therapy:** An intervention that provides treatment for children with behavioural difficulties in the early years. The program is associated with significant improvements in behaviour intensity; maternal anxiety, depression and stress; the proportion of families with clinical levels of parenting stress; and difficulties with internalising and externalising behaviour.[17]
- **Let's Start:** Let's Start Parent-Child Program is a therapeutic parenting program that helps support the social and emotional needs of children as they begin the transition to school. Let's Start brings together expertise about child development, early learning, and parenting to support the emotional wellbeing of parents and children. It is respectful of kinship, culture, and Aboriginal family values, and care is taken to adapt Let's Start to meet local needs. The Let's Start evaluation identified a significant reduction in problem behaviour and parental distress, resulting in improved child wellbeing and parental self-efficacy.[18] The evaluation identified challenges with attracting and retaining families in the intervention.[19]
- **Parenting Under Pressure:** The program is aimed at families with highly complex needs, such as parental substance abuse or involvement with the criminal justice system. Those receiving the PUP program showed significant reductions in parenting stress, child abuse potential, methadone dose, child behaviour problems, maternal emotional wellbeing, parent-child functioning and levels of stress experienced in the parenting role.
- **Family Wellbeing Project:** This program is not targeted specifically at parents of young children, but through a focus on empowerment and personal development the program aims to enhance problem-solving skills and strengthen healthy behaviour and family wellbeing. Strong qualitative feedback has identified an enhanced capacity to exert control over factors shaping health and wellbeing, and the development of attitudes and skills to help parents to cope better with day-to-day life challenges.[20]
- **Incredible Years:** A parent training program that aims to give parents and teachers strategies to build positive relationships, foster attachment, manage challenging behaviour and support emotional regulation. The core components of the program have a solid evidence-base. A pilot study of the Incredible Years in New Zealand found that the program was effective with Maori families, although the effect sizes were generally smaller than for non-Māori.[21]

Strait Islander children and families. In part, this reflects an under-investment in rigorous program evaluation, the challenges involved in conducting research in this area, and systemic issues involved in translating evidence into practice. However, there are also underlying issues that appear to dampen the effectiveness of 'manualised' programs and their capacity to lead to sustained change.

In order to effectively facilitate behaviour change, program content must first resonate with the beliefs and expectations families and communities hold about child development, health and wellbeing, and the role of parents.[26] An intervention's 'cultural fit' reflects its capacity to recognise and promote strengths and encourage change.[27] The reduced impact that many existing programs and interventions have for Aboriginal and Torres Strait Islander families and communities points to the need for greater attention to the way messages about early childhood development are conceptualised and communicated.[28]

Additionally, children require regular, consistent and ongoing exposure to developmental opportunities. One-off interventions or programs that do not respond holistically to families' needs and circumstances are not, by themselves, likely to change children's trajectories. To achieve sustained change, programs and interventions must be delivered with a duration and intensity that ensures children receive an adequate 'dose', as well as in cross-sector partnership and as part a of a coherent and well-functioning service system.

The evidence indicates that

> the best early child development interventions take place in comprehensive, integrated programs that combine nurturing and care, nutrition and stimulation. They begin early, preferably during pregnancy, and are sustained through primary school.[29]

Without investing in co-design and quality implementation, and ensuring that programs communicate the core messages of child development science in ways that resonate with the expectations and beliefs of Aboriginal parents, families and communities, their impact will be limited.

Recommendations

Based on the strength of evidence, impact (i.e. effect size), likely reach, 'implementability', and potential for scalability and sustainability, the specific interventions that could be considered for promoting a healthy start to life for Aboriginal and Torres Strait Islander children include:

- **Sustained nurse home visiting programs**: rigorously designed and well-implemented nurse home visiting programs are among the most effective and rigorously evaluated early childhood interventions, and hold significant promise for improving outcomes for Aboriginal and Torres Strait Islander children. Sustained home visiting should be prevention-focused, embedded within existing universal maternal and child health services, and available to families with potential vulnerabilities, not just those in crisis. The evidence indicates that effective sustained nurse home visiting programs address parenting skill development and early learning, alongside maternal and child health.
- **Home learning programs**: there is significant potential for home learning programs that equip parents and families to provide developmentally rich home learning environments, support children's transition to school, and recognise and build on the strengths of Aboriginal and Torres Strait Islander approaches to teaching young children. These programs should be promoted as universal interventions, and efforts should be made to foster greater integration between early learning and maternal and child health.

- sufficient flexibility to incorporate local priorities and build on local strengths while retaining the basic logic of the program, and
- good data collection and sound evaluation to both inform the progressive implementation of the program and to generate good knowledge of its value.

We recommend that governments and bodies with expertise in this area take up this opportunity as a priority.

Dockett, S., Perry, R. and Kearney, E. (2010). *School readiness: what does it mean for Indigenous children, families, schools and communities*? Issues Paper 2, Closing the Gap Clearinghouse, AIHW and AIFS. [http://www.aihw.gov.au/uploadedFiles/ClosingTheGap/Content/Publications/2010/ctg-ip02.pdf]

[14] Wade, C., Macvean, M., Falkiner, J., Devine, B., and Mildon, R. (2012). *Evidence review: An analysis of the evidence for parenting interventions in Australia*. Parenting Research Centre, Melbourne [http://www.parentingrc.org.au/index.php/resources/parenting-interventions-in-australia]

[15] Turner, K.M., Richards, M. and Sanders, M.R. (2007). "Randomised clinical trial of a group parent education program for Australian Indigenous families". Journal of Paediatric child Health 43:6, pp. 429-437 [http://espace.library.uq.edu.au/eserv/UQ:94419/UQ_AV_94419.pdf]

[16] http://www.biomedcentral.com/content/pdf/1741-7015-10-130.pdf

[17] Wade, C., Macvean, M., Falkiner, J., Devine, B., and Mildon, R. (2012). *Evidence review: An analysis of the evidence for parenting interventions in Australia*. Parenting Research Centre, Melbourne [http://www.parentingrc.org.au/index.php/resources/parenting-interventions-in-australia]

[18] Robinson, G., Zubrick, S. R., Silburn, S., Tyler, W., Jones, Y., D'Aprano, A., McGuinness, K., Cubillo, C., Bell, M., Stock, C., (2009), *Let's Start: Exploring Together. An early intervention program for Northern Territory children and families. Final evaluation report*, Darwin: School for Social and Policy Research, Institute of Advanced Studies, Charles Darwin University [http://ccde.menzies.edu.au/sites/default/files/lets-start-evaluation-report.pdf]

[19] Robertson, G. and Zubrick, S. (2012). Context, Diversity and Engagement: Early Intervention with Australian Aboriginal Families in Urban and Remote Contexts. *Children and Society*, 26, 343–355.

[20] Tsey, K., Whiteside, M., Haswell-Elkins, M., Bainbridge, R., Cadet-James, Y. and Wilson, A. (2010). *Empowerment and Indigenous Australian health: a synthesis of findings from Family Wellbeing formative research. Health and Social Care in the Community*; 18(2): 169-179 [http://www.healthinfonet.ecu.edu.au/key-resources/programs-projects?pid=106]

[21] Sturrock, F. and Gray, D. (2013). The Incredible Years Pilot Study: Evaluation Report. Centre for Research and Evaluation, Ministry of Social Development, New Zealand. [http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/incredible-years-report/incredible-years-report-august2013.pdf]

[22] WA Commissioner for Children and Young People (2012), *Building Blocks: Best practice programs that improve the wellbeing of children and young people – Edition One.* *[https://www.eduweb.vic.gov.au/edulibrary/public/beststart/2007/bs_eval_report_Sept2006.pdf]*

[23] Overcoming Indigenous disadvantage (AIHW, 2011).

[24] Robinson, G., Zubrick, S. R., Silburn, S., Tyler, W., Jones, Y., D'Aprano, A., McGuinness, K., Cubillo, C., Bell, M., Stock, C., (2009), *Let's Start: Exploring Together. An early intervention program for Northern Territory children and families. Final evaluation report*, Darwin: School for Social and Policy Research, Institute of Advanced Studies, Charles Darwin University [http://www.lowitja.org.au/sites/default/files/docs/lets-start-evaluation-report-2010.pdf]

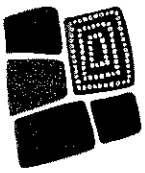
Turner, K., Richards, M. and Sanders, M. (2007) "Randomised clinical trial of a group parent education programme for Australian Indigenous families," *Journal of Paediatrics and Child Health* 43 (6): 429-437.

[25] Wade, C., Macvean, M., Falkiner, J., Devine, B., and Mildon, R. (2012). *Evidence review: An analysis of the evidence for parenting interventions in Australia*. Parenting Research Centre, Melbourne [http://www.parentingrc.org.au/index.php/resources/parenting-interventions-in-australia]

Communities That Care (2012), *A Guide to Australian Prevention Strategies*, Communities That Care Ltd., The Royal Children's Hospital, Parkville, Melbourne; Victorian Government Department of Education and Early Childhood Development, *Catalogue of Evidence* (http://www.education.vic.gov.au/about/research/Pages/summstrat.aspx).

[26] Grieves, V. (2009). Aboriginal Spirituality: Aboriginal Philosophy, The Basis of Aboriginal Social and Emotional Wellbeing, Discussion Paper No. 9, Cooperative Research Centre for Aboriginal Health, Darwin. [http://www.lowitja.org.au/sites/default/files/docs/DP9-Aboriginal-Spirituality.pdf]

[27] Robertson, G. and Zubrick, S. (2012). Context, Diversity and Engagement: Early Intervention with Australian Aboriginal Families in Urban and Remote Contexts. *Children and Society*, 26, 343–355.



the Lowitja INSTITUTE
Australia's National Institute for Aboriginal and Torres Strait Islander Health Research

ARACY
Australian Research Alliance for Children & Youth
Collaboration • Evidence • Prevention

The importance of a healthy start to life: Synopsis of evidence

Dr Lance Emerson and Dr Stacey Fox, ARACY
September 2013

Introduction

A wealth of evidence over the last 50 years links development in the early childhood years (zero to five) to future health and wellbeing outcomes. As the World Health Organization states,

> the many challenges faced by adults, such as mental health issues, obesity, heart disease, criminality, and poor literacy and numeracy, can be traced back to early childhood. [1]

The evidence shows that early childhood provides a crucial window of opportunity for public policy interventions to shape long-term health trajectories. Once this opportunity to intervene has passed it is increasingly difficult (and typically more costly) to alter course.

This synopsis summarises eight key themes that are important to the concept of 'a healthy start to life':

1. The brain: biological embedding and healthy brain development
2. The body: links between early child development and later physical health
3. Adverse childhood experiences and epigenetics
4. The impact of parenting on health child development
5. The impact of poverty on healthy child development
6. The concept of risk and protective factors to positive child development
7. The cost benefits of a health start to life
8. The importance of connection to culture for Aboriginal and Torres Strait Islander children's wellbeing.

1. The brain: biological embedding and brain development

In a child's first three years of life their brain grows from approximately 25 per cent to 80–90 per cent of adult size. Important connections between the brain's nerve cells are developed and there is rapid growth in cognitive, language and social and emotional development.[2] Brain development during these early years is strongly subject to environmental experiences and influences. While these early years provide a significant opportunity for development, negative experiences during this critical period can impact upon outcomes throughout life.[3]

This process of biological embedding[4] is at its most influential from gestation and into the early years of life when the brain is undergoing critical phases of growth and development:

As detailed in the table above, antenatal health is particularly important: risk factors to in-utero brain development during maternity include smoking, alcohol and drug use, malnutrition, antenatal depression, and stress. We know that these risks are linked to a range of later health and development outcomes including: behaviour and conduct disorders (including criminality), hyperactivity, emotional and cognitive functioning, intellectual impairment, anxiety and depression.[6 19]

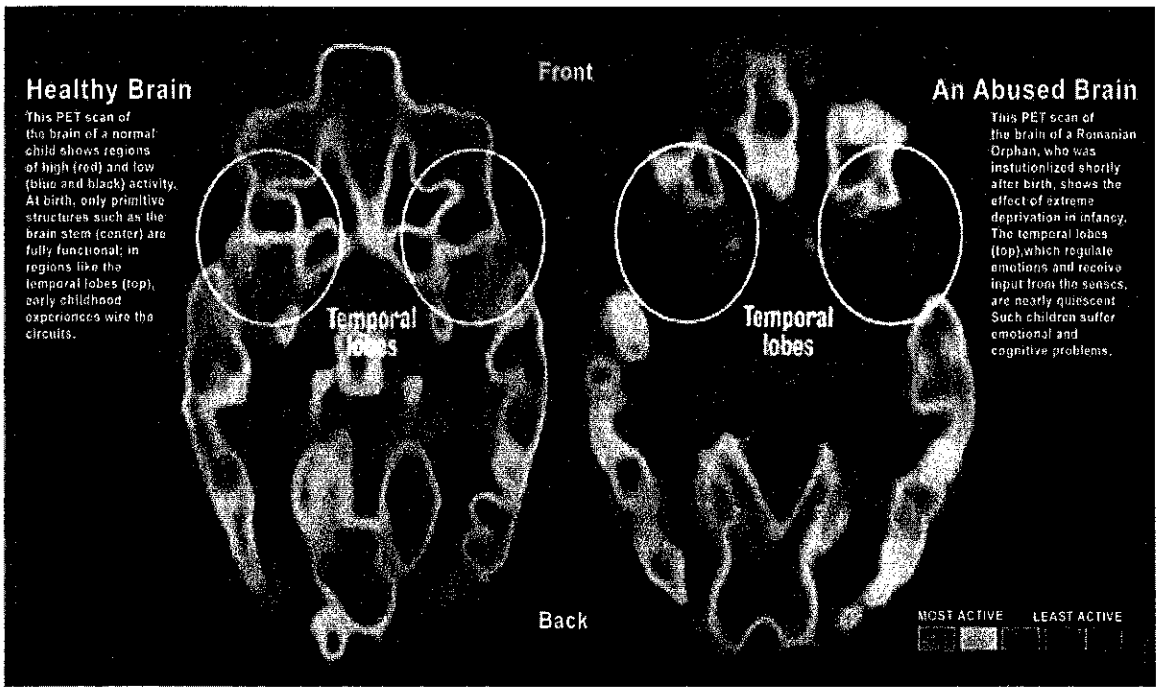
3. Adverse childhood experiences and epigenetics

The importance of early brain development and the lasting impact of positive early physical health has been empirically validated through the pivotal Adverse Childhood Experiences (ACE) Study.

The ACE study commenced as a joint research project of Kaiser Permanente and the U.S. Centers for Disease Control and Prevention, and is one of the largest investigations ever conducted to assess associations between childhood and later-life health and wellbeing. It involved 17,000 people and examined the association between childhood experience and health. It demonstrates how stress and trauma early in life (e.g. neglect, abuse, family death)[20] can increase the likelihood of a raft of adult issues including: hyperactivity, anxiety, depression, suicide, substance abuse, violent behaviour, criminality, lower IQ and economic performance, cardiovascular health problems, diabetes, obesity and biomedical disease.[5 6] Longitudinal studies in Australia and other countries add weight to this evidence by examining the association between the developmental environment to which a child has been exposed and a range of health outcomes.

An oft-cited example of the impairment to a child's brain physical development and function is shown in figure 2.

Figure 2 – How Adverse Childhood Experiences impair a child's brain development[21]



Central to ACE is the science of epigenetics: the study of changes in gene expression caused by mechanisms *other than* changes in the underlying DNA – with some of these changes being heritable. As one journal headline puts it

in the UK demonstrates that both poverty and parenting quality are important in affecting child development outcomes, but that poor parenting has nearly twice the impact of persistent poverty, and positive parenting and a strong home learning environment can mediate its impacts.[29] This has led to the assertion that

> what parents do is ultimately more important than who parents are... [30]

The idea that children's development is entirely dependent on the actions of their parents has appeal (particularly in today's economic climate), however, this underplays the impact of poverty on child development, as detailed in the next section.

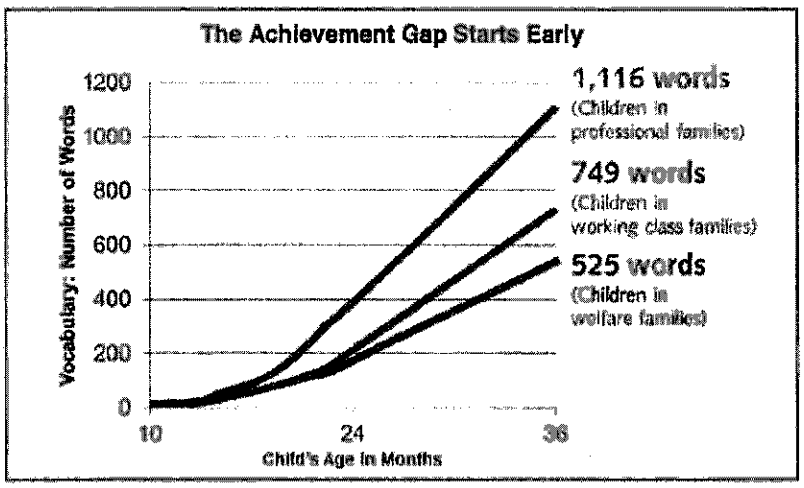
5. Parenting matters, but so does poverty

Socio-economic disadvantage is recognised as a major risk factor for poorer outcomes. Studies that document the impact of socio-economic status[31] show that children from the most deprived backgrounds are more likely to encounter adverse health outcomes in adulthood; this picture improves incrementally in line with income (or other measures for wealth/deprivation). As summarised by a recent expert review in Canada:

> Even among children, SES ranks as one of the most powerful and reliable epidemiologic predictors of human morbidities. Impoverished children sustain higher rates of virtually every form of human malady and developmental hurdles: low birthweight, traumatic injury, infectious disease, psychiatric disorders, developmental disability, dental health, academic achievement. **Error! Bookmark not defined.** [32]

The impact of poverty is widely recognised in Australia, where a range of poor outcomes are associated with lower socio-economic status including lower educational attainment, higher mortality and morbidity, and levels of mental ill-health. A striking example of the impact of poverty on early child development is research conducted with regard to early literacy, which shows that the number of words used by children decreased as socio-economic status decreases (see Figure 3).[33] This then is associated with lower academic achievement – and for some children then repeating the cycle of disadvantage for their children.

Figure 3 – Child vocabulary development by parent income[34]

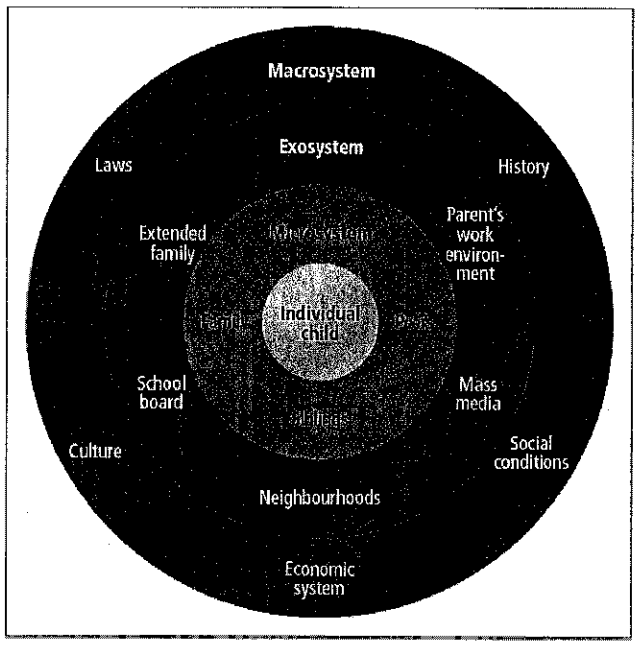


It must be remembered, however, that not everyone born into relative poverty faces an inevitable pathway towards poorer health. Similarly, not every child born into wealth will be healthy. While it is true to say that in general, the incidence (or percentage) of child vulnerability may be higher in lower socio-economic status groups, there is a greater number of children who

average intelligence, family harmony, supportive relationships with other adults and community involvement).[42]

It is also recognised that no child or family lives in a vacuum. There are many complex social and environmental factors that may directly or indirectly influence daily decisions and shape the outcomes of the child and family. Drawing on the ecological model of child development, these factors combine to influence early childhood can be understood to operate at the level of the child, his or her family, his or her networks and wider community and society factors,[43] as detailed in Figure 4.

Figure 4: The ecological model of child development[44]



It is the interaction of risk and protective factors that, through their combined and cumulative effects, shape the developmental trajectories of children. Figures 5 and 6 demonstrate the pathways through which children's vulnerability and resilience is developed, reinforced and consolidated over time. The figures demonstrate the importance of early childhood in establishing the foundations for future health and wellbeing, as well as the need for early childhood interventions that are multifaceted, mutually reinforcing and targeting the key determinants of children's outcomes.

Understanding the ecological model of child development, as well as those risk and protective factors allows us to better understand how to intervene to improve child outcomes (through prevention or treatment). Early childhood risk and protective factors are summarised in Figure 7.

Figure 7 –Summary of risk and protective factors for children[45]

Level	Risk factors	Protective factors
Child	Delayed development Difficult temperament	Social skills Attachment to family Independence
Immediate family and household	Lack of warmth and affection Physical or mental illness (e.g. depression) Family instability, conflict or violence	Competent and stable care Breastfeeding Adequate family income and housing
Kinship and internal networks	Isolation Absence of peer and social supports	Positive supportive relationships with extended family and friends and neighbours Cultural and faith-based networks
Community environments, networks and formal services	Inadequate housing Socio-economic disadvantage	Positive, supportive relationships with teachers and community professionals Participation in community activities (e.g. sport, recreation, church) Access/availability of community services (e.g. playgroups, health services, childcare and education) Freedom from discrimination (e.g. racism, sexism)
Broader economic, policy, political, social and environmental influences	Environmental conditions (e.g. drought, flooding) Unstable economic conditions (e.g. unemployment)	Child and family-friendly public policies High quality universal programs (e.g. health care, early childhood education and care)

7. Cost-benefits of a healthy start to life

A number of studies have explored the cost-benefits of a healthy start in life, typically in the context of early intervention strategies and programs. While some of these analyses face methodological limitations (e.g. projecting costs, assuming certain patterns and outcomes are a direct impact of an intervention), the weight of evidence shows that programs based on key principles of human growth and development that are delivered in the early years offer the best return on investment.[46]

This research demonstrates that a healthy start in life improves economic outcomes by increasing earning capacity (and taxation revenue) while, at the same time, reducing the need for often costly interventions in health, welfare, education and criminal justice systems later in life. For instance, a longitudinal study in a disadvantaged area of London shows that by the age of 28 the cost to society of individuals with childhood conduct disorder is ten times higher than for those without these problems, due to increased use of the criminal justice, health, remedial education, and welfare service systems.[47]

The often cited work of Nobel Prize winning University of Chicago Economics Professor James Heckman's demonstrates that there are great gains to be had by investing in early and equal development of human potential, as detailed in Figure 8.

References

[1] World Health Organisation. (2009). *Early Childhood Development*, Factsheet No. 332. [http://www.who.int/mediacentre/factsheets/fs332/en/]

[2] Royal Australian College of Physicians. (2006). *Health of children in out-of-home care*, Royal Australian College of Physicians, Sydney.

[3] Center on the Developing Child. (2010). *The Foundations of Lifelong Health are Built in Early Childhood*, Harvard University, Cambridge. [http://developingchild.harvard.edu/resources/reports_and_working_papers/foundations-of-lifelong-health/]

[4] Silburn, S.R., Nutton, G., Arney, F. and Moss, B. (2011). *The First 5 Years: Starting Early.* Early Childhood Series #2, commissioned for the public consultations on the Northern Territory Early Childhood Plan, Northern Territory Government, Darwin. [http://ccde.menzies.edu.au/sites/default/files/resources/Silburn%202011%20First5YrsStartingEarly%20No.%202.pdf]

[5] Silburn SR, Nutton G, Arney F, Moss B (2011), *The First 5 Years: Starting Early.* Early Childhood Series #2, commissioned for the public consultations on the Northern Territory Early Childhood Plan, Northern Territory Government, Darwin. [http://developingchild.harvard.edu/resources/reports_and_working_papers/foundations-of-lifelong-health/]

[6] McCain, M.N., Mustard, J.F. and Shanker, S. (2007). *Early Years Study 2: Putting Science into Action*, Council for Early Child Development, Toronto. [http://earlyyearsstudy.ca/media/uploads/more-files/early_years_study2-en.pdf]

[7] Center on the Developing Child. (2007). *A Science-Based Framework for Early Childhood Policy: Using Evidence to Improve Outcomes in Learning, Behavior, and Health for Vulnerable Children,* Harvard University, Cambridge.[http://www.developingchild.harvard.edu]

[8] Marmot, M. (2010). *Fair Society, Healthy Lives: The Marmot Review*, Strategic Review of Health Inequalities in England post-2010, London. [http://www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review]

[9] Council of Australian Governments (COAG). (2009). *Investing in the Early Years: A National Early Childhood Development Strategy.* [http://www.coag.gov.au/sites/default/files/national_ECD_strategy.pdf]

[10] UNICEF. (n.d.). *What is the Role of Nutrition?* [http://www.unicef.org/nutrition/index_role.html]

[11] UNICEF, *Early Childhood Development: The Key to a Full and Protective Life.* [http://www.unicef.org/dprk/ecd.pdf]

[12] Horta, B.L. and Victora, C.G. (2013). *Long-term Effects of Breastfeeding – A Systematic Review*, World Health Organisation, Geneva. [http://apps.who.int/iris/bitstream/10665/79198/1/9789241505307_eng.pdf]

[13] World Health Organisation bulletin, *Vaccination greatly reduces disease, disability, death and inequity worldwide.* [http://www.who.int/bulletin/volumes/86/2/07-040089/en/]

[14] Australian Medical Association. (2012). *Australia's leading scientists collate compelling evidence in support of immunisation.* [https://ama.com.au/media/australias-leading-scientists-collate-compelling-evidence-support-immunisation]

[15] US Centers for Disease Control and Prevention, *Childhood Obesity Facts.* [http://www.cdc.gov/healthyyouth/obesity/facts.htm]

[16] Centre of Excellence for Early Childhood Development. (2011). *Physical Activity in Early Childhood: Setting the Stage for Lifelong Healthy Habits*, Strategic Knowledge Cluster on Early Childhood Development, Montreal. [http://www.excellence-earlychildhood.ca/documents/parenting_2011-04.pdf]

[17] Tansey, S. (2009). *"Supporting Children's Development – Gross Motor Skills," Putting Children First: 30*, National Childcare Accreditation Council. [http://ncac.acecqa.gov.au/educator-resources/pcf-articles/Supporting_children's_development_gross%20motor_Jun09.pdf]

[18] Gulay, H., Seven, S. and Damar, M. (2010). *The Effects Gross Motor Skills in Pre-School Children have on Their Peer Relations and Social Status*, *Research Journal of Biological Sciences*, 5:11, pp. 722-726.

[37] Dickerson, A. and Gurleen, JP. (2012).*Persistent poverty and children's cognitive development: Evidence from the UK Millennium Cohort Study*. Centre for Longitudinal Studies, London. [www.cls.ioe.ac.uk/shared/get-file.ashx?id=1436&itemtype=document]

[38] Dickerson, A. and Gurleen, JP. (2012).*Persistent poverty and children's cognitive development: Evidence from the UK Millennium Cohort Study*. Centre for Longitudinal Studies, London. [www.cls.ioe.ac.uk/shared/get-file.ashx?id=1436&itemtype=document]

[39] Katz, I., La Placa, V. and Hunter, S. (2007).*Barriers to inclusion and successful engagement of parents in mainstream services*. Joseph Rowntree Foundation, York.

Henricson, C. (ed.) (2002) *Reaching Parents: Producing and Delivering Parent Information Resources.* London: NFPI

Cortis, N., Katz, I., & Patulny, R. (2009). *Engaging hard-to-reach families and children* (Occasional Paper No. 26). Canberra: Department of Families, Housing, Community Services and Indigenous Affairs.

[40] Henricson, C. (ed.) (2002) *Reaching Parents: Producing and Delivering Parent Information Resources.* London: NFPI

[41] Centre for Parenting Research. 2005

[42] Centre for Community Child Health. (2000). *A Review of Early Childhood Literature*, Murdoch Childrens Research Institute, Royal Children's Hosptial, Melbourne.

[43] Bronfenbrenner, U. (1979). The Ecology of Human Development, Harvard University Press, Cambridge.

[44] Moloney, L., Weston, R., Qu, L., & Hayes, A. (2012). *Families, life events and family service delivery* (Research Report No. 20). Melbourne: Australian Institute of Family Studies. [www.aifs.gov.au/institute/pubs/resreport20/rr20f.html]

[45] Australian Early Development Index, Risk and Protective Factors for Early Child Development, accessed at http://training.aedi.org.au/Understanding/What-influences-children-s-development/Risk-protective-factors-for-early-child-developmen.aspx

[46] Heckman, J. (2006). "Skill formation and the economics of investing in disadvantaged children," *Science* 312: 5782, pp, 1900-1902.

[47] Robinson G, Silburn, SR, Arney F (2011), *The value of investment in the early years: Balancing costs of childhood services*. Topical paper commissioned for the public consultations on the Northern Territory Early Childhood Plan, Northern Territory Government, Darwin.

[48] Heckman, J. (). The Case for Investing in Disadvantaged Young Children. [http://heckmanequation.org/content/resource/case-investing-disadvantaged-young-children]

[49] Kershaw P, Warburton B, Anderson L, Hertzman C, Irwin L, Forer B. (2010.) "The Economic Costs of Early Childhood Vulnerability in Canada", *Canadian Journal of Public Health* 101: 13, S8-S12.

[50] Adema, W. (2008), , OECD.