

Child maltreatment: pathway to chronic and long-term conditions?

Taylor, Julie; Bradbury-Jones, Caroline; Lazenbatt, Anne; Soliman, Francesca

DOI:
[10.1093/pubmed/fdv117](https://doi.org/10.1093/pubmed/fdv117)

Document Version
Peer reviewed version

Citation for published version (Harvard):
Taylor, J, Bradbury-Jones, C, Lazenbatt, A & Soliman, F 2015, 'Child maltreatment: pathway to chronic and long-term conditions?', *Journal of Public Health*. <https://doi.org/10.1093/pubmed/fdv117>

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

This is a pre-copyedited, author-produced PDF of an article accepted for publication in *Journal of Public Health* following peer review. The version of record: Taylor, Julie, et al. "Child maltreatment: pathway to chronic and long-term conditions?." *Journal of public health* (2015) is available online at: <http://dx.doi.org/10.1093/pubmed/fdv117>

Checked October 2015

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

Child maltreatment: pathway to chronic and long-term conditions?

Professor Julie Taylor – Director, University of Edinburgh/NSPCC Child Protection Research Centre, Simon Laurie House, 186-198 Canongate, Edinburgh EH8 8AQ

Dr Caroline Bradbury-Jones – Reader in Nursing, School of Health and Population Sciences, College of Medical and Dental Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT

Dr Anne Lazenbatt – NSPCC Reader in Childhood Studies, Institute of Child Care Research, School of Sociology, Social Policy and Social Work, Queen's University Belfast 6 College Park, Belfast BT7 1LP

Ms Francesca Soliman* – Research assistant, University of Edinburgh/NSPCC Child Protection Research Centre, Simon Laurie House, 186-198 Canongate, Edinburgh EH8 8AQ. Email address: Francesca.Soliman@ed.ac.uk

*Corresponding author

Final Accepted Version AUGUST 2015

Abstract

The manifesto *Start Well, Live Better* by the UK Faculty of Public Health (2014) sets out twelve compelling priorities for the protection of people's health. The focus of this document is preventative, calling for a comprehensive strategy to target a wide-ranging set of challenges to public health; however, it fails to mention child maltreatment and its negative impact on long-term health outcomes.

In this article we explore the long-term negative consequences of child maltreatment and how these can be conceptually aligned with four different characteristics of long-term health conditions. We suggest that situating child maltreatment within a long-term conditions framework could have significant advantages and implications for practice, policy and research, by strengthening a commitment across disciplines to apply evidence-based principles linked with policy and evaluation, and recognising the chronic effects of maltreatment to concentrate public, professional and government awareness of the extent and impact of the issue.

We argue that a public health approach is the most effective way of focusing preventative efforts on the long-term sequelae of child maltreatment and to foster cooperation in promoting children's rights to grow and develop in a safe and caring environment free from violence and abuse.

Final Accepted Version AUGUST 2015

Introduction

In its 2014 manifesto *Start Well, Live Better* the UK Faculty of Public Health (2014) sets out twelve compelling priorities for the protection of people's health. The priority areas fall under four broad categories: Give every child a good start in life; Introduce good laws to prevent bad health and save lives; Help people live healthier lives; Take national action to tackle a global problem. The focus of this document is clearly preventative, calling for a comprehensive strategy to target a wide-ranging set of challenges to public health, such as addressing inequality, low wages, and poor access to services, whilst advocating for targeted measures such as more stringent regulation around the sale and advertising of tobacco, alcohol, and unhealthy foods (See Table 1).

While some priority areas focus specifically on children, the manifesto fails to mention child abuse and neglect (collectively maltreatment) and their well known negative impact on long-term health outcomes. According to the manifesto, "*obesity and climate change are two of our biggest public health challenges*" (p.12). We argue however that child maltreatment also constitutes a significant threat to public health. Child maltreatment is not a disease process, but its consequences may create pathways to disease; these are overlapping, and include determinants which span emotional, psychosocial, cognitive, behavioural and biological perspectives. In this article we explore the long-term consequences of child maltreatment and how these might be conceptually aligned with the characteristics of long-term health conditions. By looking at maltreatment through this lens we can not only improve the practitioner community's understanding of its impact on public health, but also devise a more efficient and comprehensive public health strategy.

[Insert Table 1]

Long-term outcomes of child maltreatment

Childhood abuse can be linked to adverse health conditions through a number of inter-linking pathways: emotional pathways show that early attachment and secure environments can have long-term positive effects on brain and neural development, and they can act as buffers and modulate stress (Cozolino 2002); behavioural pathways link child abuse to adult negative coping behaviours such as substance misuse and suicidal behaviour (Draper et al. 2008); social pathways link child adversity and negative health outcomes with difficulties in interpersonal and intimate relationships (Draper et al. 2008). The Adverse Childhood Experiences (ACE) Study (Felitti and Anda 2010) is one of the largest studies conducted on the links between childhood maltreatment and longer-

term health, and it details information from more than 17,000 adults over a ten-year period. Findings have demonstrated a direct association between adverse childhood experiences and poorer morbidity and mortality that goes beyond those effects that could be explained by behaviours alone (e.g. smoking). Studies on the effects of ACEs repeatedly show *“a positive graded relationship to a wide variety of health and social problems”* (Anda et al. 2010: p.95) such as lung cancer (Brown et al. 2010) and heart disease (Johnson et al. 2013). The study also suggests that ACEs may be related to longer term adult physical health conditions by two mechanisms: firstly, the use of negative coping mechanisms to address difficulties associated with childhood adversity, and secondly, long-lasting levels of stress that impact directly on the individual’s physical health and wellbeing.

It must be stressed, however, that not all individuals exposed to multiple risks in childhood go on to experience long-term conditions, or that those who develop long-term conditions have had abusive childhoods. Emerging literature from neuroscience and epigenetics is tentatively moving the debate forward to suggest a probable causal link (Tyrka et al. 2012). Such hypothesised causal pathways have been identified in many studies and are thought to be mediated by changes in stress responsivity via the hypothalamic-pituitary-adrenal axis, and subsequently through an inflammatory process that contributes to longer-term health risks including anxiety, depression and cardiovascular disease (Bick et al. 2015a, Hackman et al. 2010, Johnson et al. 2013, Tyrka et al. 2012). The physiological response to stress appears to be disrupted by child maltreatment, subsequently influencing the risks of inflammation, depression and metabolic disorders in later life (Gunnar and Quevedo 2007, McCrory et al. 2010, Mehta et al. 2013, Tyrka et al. 2012). Importantly, conditions are often clustered in the same individual and this co-occurrence can lead to a greater risk of long-term conditions in later life. The growing recognition of the complex interplay between biological and environmental factors in influencing child development has highlighted the mechanisms through which trauma can lead to these sequelae in the long term (Rutter 2007). Nonetheless, recent research has shown that epigenetic changes are not necessarily permanent (Bick et al. 2015b, Yang et al. 2013), thus further underlining the need for comprehensive, life-long interventions to promote resilience and mitigate negative health outcomes (Rutter 2006).

Aligning child maltreatment and long-term conditions

A long-term condition is one that persists across time and requires health care management (World Health Organization 2002). It requires ongoing medical care; limits daily activities; and is likely to last longer than one year (Department of Health 2005,

Department of Health 2012). Van der Lee and colleagues (2007) suggest that recurrent themes include the non–self-limited nature, the association with persistent and recurring health problems, and duration measured in months and years.

There is no definitive list, but long-term conditions include diabetes, asthma and coronary heart disease. Data from 2010/11 suggest that around 15 million people in England are afflicted by long-term conditions, and rates are rising across the world (Department of Health 2012). In Australia and the United States low back pain, major depressive disorder and musculoskeletal disorders are major causes of disability, while the top three causes in Sweden are ischaemic heart disease, lower back pain, and cerebrovascular disease (IMHE, 2013). Moreover, the evidence suggests that at least 30% of all people with a long-term condition also have a mental health problem (Cimpean and Drake 2011). Statistics point to the extent of long-term conditions as contributing significantly to the global burden of disease. They present a considerable challenge to health and they are increasingly the primary concern of healthcare systems globally (Epping-Jordan et al. 2004). People with long-term conditions are intensive users of health and social care services: in the UK some 80% of primary care consultations and two thirds of emergency hospital admissions are related to long-term conditions (Department of Health 2012).

Long-term conditions can be summed up by the following four key characteristics: 1) they present a significant challenge to health; 2) they persist over time; 3) they result in intensive use of health and social care services; 4) they cannot be cured, but can be managed. Aligning these characteristics with child maltreatment can provide a useful lens through which to understand the health impact of child maltreatment and the need for a comprehensive health strategy to both prevent and manage its long-term outcomes.

1) A significant challenge to health

It is no longer contested that the consequences of childhood abuse and neglect are persistent, with long-term physical or mental ill health impacts. These sequelae can occur irrespective of whether the abuse was sexual or non-sexual, including physical and emotional maltreatment. We do not have a complete understanding of the pathways through which health can be compromised in the longer term, but early experiences of maltreatment are often associated with greatly increased risk of childhood mental health problems such as depression, post-traumatic stress disorder, conduct disorder, and other behavioural disorders (Cicchetti and Valentino 2006). The longer-term costs to society are high if these become translated over time into various mental health

problems (Allen 2011). Indeed, evidence highlights that adult survivors of childhood abuse have more medical problems than their non-abused counterparts (Sachs-Ericsson et al. 2005), with medical conditions such as diabetes (Kendall-Tackett 2003), gastrointestinal problems (Leserman 2005) and obesity (Williamson et al. 2002) being more common when a maltreatment history is present. Consequences vary between individuals, and they may be caused directly (e.g. as a result of an injury), be a consequence of behaviour patterns in coping with abuse, or be linked intrinsically at a developmental level. More broadly, there is emerging scientific consensus that the origins of adult physical and mental illness are often found in early adverse experiences (Felitti and Anda 2010, Shonkoff 2010). In a meta-analysis of the long-term health consequences of childhood maltreatment, Norman and colleagues (2012) confirm a causal relationship between non-sexual child maltreatment and a range of mental disorders, drug use, suicide attempts and risky sexual behaviour into adulthood, while adult survivors of child sexual abuse experience more depression, eating disorders and addictions (Wilson 2010).

2) The consequences of child maltreatment persist over time

Intergenerational cycles of violence and abuse within families are well evidenced (Child Welfare Information Gateway 2008, National Council on Child Abuse and Family Violence 2013). A history of childhood maltreatment can affect both parenting behaviours and the parenting environment, and it is associated with a higher risk for future generations of being maltreated, whether by the parent or by an intimate partner or family member (Fujiwara et al. 2012). These mechanisms are complex, and maltreatment is not always transferred between generations. However, unless we understand how to break intergenerational cycles of abuse, subsequent generations remain at increased risk of being maltreated, and over time multiple adversities experienced in childhood may express themselves in intergenerational homelessness, imprisonment, addictions, mental health problems and early death (Thornberry et al. 2010). In this way, associations between childhood experiences and later adult outcomes become obscured by the passage of time (Dixon et al. 2009) and may only be fully recognised many years later.

3) Child abuse and neglect result in intensive use of and cost to health and social care services

The costs of child abuse and neglect and associated disruptive behavioural disorders have been quantified in different studies. Currie and Tekin (2006) attempted to estimate the costs of families experiencing multiple adversities. We have already outlined the burden of physical and mental health disease and thus the subsequent pressures this

affords the health service. Brown et al (2010) reported a 20 year reduction in life expectancy for children who had six or more ACEs (predominantly forms of abuse) relative to children experiencing none, suggesting a strong dose-response relationship between the number of adversities and poor health outcomes for adults (Green et al. 2010). Emphasis on the early years in the UK's policy agenda is recognition of the cumulative burden over time. Allen (2011) has reinforced the rationale for early intervention as the opportunity *"to make lasting improvements in the lives of our children, to forestall many persistent social problems and end their transmission from one generation to the next, and to make long-term savings in public spending"* (Allen 2011: p.vii). A growing body of international evidence supports the view that early intervention is helpful both in preventing abuse (Krugman et al. 2007, Shonkoff 2010) and in mitigating negative outcomes once abuse has already occurred (Bick et al. 2015b). A clear example of effective early intervention is the Nurse-Family Partnership developed in the United States by Olds (2007), which provides intensive visitation by nurses during a woman's pregnancy and the first two years after birth.

4) *The consequences of child abuse and neglect cannot be cured, but recovery is possible*

A child who has experienced abuse or neglect may be affected to some degree for life: *"Repeated maltreatment and high levels of persistent neglect mean that for many children, maltreatment is a chronic condition"* (Gilbert et al. 2009: p.68). However, survivors cannot be stereotyped and some transcend the experience (Wilson 2010). It is important to remember that recovery is possible, but for significant numbers of those who were maltreated as children, residual effects will manifest at different life stages. For example, pregnancy can be a vulnerable time, and a history of maltreatment can complicate the birth experience and negatively affect the attachment relationship with the new-born (Seng et al. 2004). What is clear is that the pathways to disease as a result of maltreatment are extremely complex and there are few singular causal linkages, rather an array of interacting factors and conditions (Munro et al. 2014). The potential to reverse the damage caused by maltreatment is limited, but intensive intervention shows outcomes can and should be improved.

Child maltreatment as a public health concern

As seen, the consequences of child maltreatment can be mapped to four different characteristics of a long-term condition. To situate child abuse and neglect within a long-term conditions framework could have significant advantages and implications for practice, policy and research. Using a long-term focus would provide a forum for a range

of disciplines to work more collaboratively through multi-professional teams. Recognition of the chronic effects of maltreatment would concentrate public and professional and government awareness of the extent and impact of the issue. These effects are perhaps currently hidden behind some of the longer term chronic disease processes such as lung cancer and heart disease (Brown et al. 2010, Johnson et al. 2013). Strengthening a commitment across disciplines to apply evidence-based principles linked with policy and evaluation is essential.

There are of course some limitations. Firstly, the contention that child abuse and neglect are long-term conditions could be challenged as being deterministic; it assumes that anyone who has experienced maltreatment as a child is destined to a life of ill-health. This is clearly not the case. To view it so would challenge the discourse of resilience and undermine the move away from a deterministic viewpoint in relation to child maltreatment. Indeed, Masten and Wright (2009) have shown that a large proportion of children who experience chronic maltreatment develop normally and show average rates of mental illness or behavioural problems. Secondly, we have already stated that adult survivors of child abuse and neglect are intensive users of health and social care services. Yet this could be regarded as a potentially stigmatising perspective, with connotations of blame for a drain on health resources. The truth is that we do not know how many survivors of maltreatment are not significant users of health services: most people never tell about their abuse histories. This post-Savile post-Hall era is testament to the many children and young people who did not speak out until several years later, and many more will always remain silent (Gray and Watt 2013).

Thirdly, one could challenge the utility of focusing on the consequences of maltreatment as a move away from 'upstream' approaches to tackling child maltreatment. It would appear to be at odds with the public health agenda of addressing maltreatment by placing emphasis on preventative strategies. However, effective public health strategies for child maltreatment are concerned not only with universal and targeted efforts to prevent maltreatment occurrence, but also to prevent reoccurrence and to reduce negative effects once it has occurred (Barlow 2008, Daniel 2011). Indeed, strong evidence suggests that treating and later trying to remedy the effects of child maltreatment are both less effective and more costly than preventing it in the first place (Kilburn et al. 2008). However there are considerable challenges for establishing conclusive research evidence on the most effective configuration of public health services given the overall complexity of the families, the adversities they experience and service structures involved.

Lastly, if the consequences of child maltreatment are to be given the same significance as other long-term conditions, then the fiscal implications are considerable. In this respect, it may better serve policy makers to remain on the periphery of recognition regarding the health consequences of child maltreatment. In this way, the significant financial investments needed to respond to this health agenda could be avoided. In reality it is quite astounding how such a major public health issue receives such little research funding and overall political attention. The *Start Well, Live Better* manifesto (2014) is an example of this. Why has the issue of maltreatment been ignored? If we are committed to giving every child a good start and promoting healthier lives, then we need to take seriously the long-term impacts of maltreatment. The Faculty of Public Health (2014) calls for national action to tackle a global problem – there is no doubt that child maltreatment is a global problem and through a public health lens we might assist in tackling its impacts.

Conclusion

Research shows us that child maltreatment represents a significant public health issue as its effects have a negative long-term impact not only on the individuals concerned, but also on the welfare of society as a whole. In this paper we have drawn parallels between a long-term conditions framework and the pathways to the devastating, persistent and long-term consequences of childhood maltreatment. We have argued that situating child maltreatment within a public health framework could have significant advantages, particularly for health-related interventions. Evidence favours a shift towards a public health, preventive approach to child maltreatment, away from a forensic approach focussed on immediate safety, responsibility and guilt. Efforts therefore should be focused on preventing the long-term sequelae of child maltreatment by using a public health and multi-sectorial approach as the most effective way of working together to promote children's rights to grow and develop in a safe and caring family environment, free from violence and abuse.

Bibliography

Allen, G. (2011) *Early intervention: Smart investment, massive savings. The second independent report to Her Majesty's government by Graham Allen MP*, London: The Cabinet Office.

Anda, R. F., Butchart, A., Felitti, V. J. and Brown, D. W. (2010) Building a framework for global surveillance of the public health implications of adverse childhood experiences. *American Journal of Preventive Medicine*, 39(1), pp. 93-98.

Barlow, J. (2008) *Setting the scene. A public health approach to child protection [conference report]*, London: NSPCC.

Bick, J., Nguyen, V., Leng, L., Piecychna, M., Crowley, M. J., Bucala, R., Mayes, L. C. and Grigorenko, E. L. (2015a) Preliminary associations between childhood neglect, MIF, and cortisol: Potential pathways to long-term disease risk. *Developmental Psychobiology*, 57(1), pp. 131-139.

Bick, J., Zhu, T., Stamoulis, C., Fox, N. A., Zeanah, C. and Nelson, C. A. (2015b) Effect of Early Institutionalization and Foster Care on Long-term White Matter Development. *JAMA Pediatrics*.

Brown, D. W., Anda, R. F., Felitti, V. J., Edwards, V. J., Malarcher, A. M., Croft, J. B. and Giles, W. H. (2010) Adverse childhood experiences are associated with the risk of lung cancer: a prospective cohort study. *BMC Public Health*, 10, pp. 1-12.

Child Welfare Information Gateway (2008) *Long-term consequences of child abuse and neglect [electronic resource]*, Available: <http://purl.access.gpo.gov/GPO/LPS124672> [Accessed 14th July 2013].

Cicchetti, D. and Valentino, K. (2006) An ecological transactional perspective on child maltreatment: Failure of the average expectable environment and its influence upon child development. in Cicchetti, D. and Cohen, D., (eds.) *Developmental Psychopathology* New York: Wiley. pp. 129–201.

Cimpean, D. and Drake, R. E. (2011) Treating co-morbid chronic medical conditions and anxiety/depression. *Epidemiology and Psychiatric Sciences*, 20(2), pp. 141-150.

Cozolino, L. (2002) *The neuroscience of psychotherapy: Building and rebuilding the human brain*, New York: WW Norton & Company.

Currie, J. and Tekin, E. (2006) Does Child Abuse Cause Crime? in: National Bureau of Economic Research (NBER) Working Papers: 12171.

Daniel, B. (2011) *Recognizing and helping the neglected child : evidence-based practice for assessment and intervention, Safeguarding children across services*, London: J. Kingsley.

Department of Health (2005) *Supporting People with Long-Term Conditions*, London: Department of Health.

Department of Health (2012) *Chronic Disease Management: A Compendium of Information (Third Edition)*, London: Department of Health.

Dixon, L., Browne, K. and Hamilton-Giachritsis, C. (2009) Patterns of Risk and Protective Factors in the Intergenerational Cycle of Maltreatment. *Journal of Family Violence*, 24(2), pp. 111-122.

Draper, B., Pfaff, J. J., Pirkis, J., Snowdon, J., Lautenschlager, N. T., Wilson, I. and Almeida, O. P. (2008) Long-Term Effects of Childhood Abuse on the Quality of Life and Health of Older People: Results from the Depression and Early Prevention of Suicide in General Practice Project. *Journal of the American Geriatrics Society*, 56(2), pp. 262-271.

Epping-Jordan, J. E., Pruitt, S. D., Bengoa, R. and Wagner, E. H. (2004) Improving the quality of health care for chronic conditions. *Quality & Safety in Health Care*, 13(4), pp. 299-305.

Felitti, V. and Anda, R. (2010) The relationship of adverse childhood experiences to adult health, well-being, social function, and healthcare. in Lanius, R. and Vermetten, E., (eds.) *The Hidden Epidemic: The Impact of Early Life Trauma on Health and Disease*, Cambridge: Cambridge University Press.

Fujiwara, T., Okuyama, M. and Izumi, M. (2012) The impact of childhood abuse history, domestic violence and mental health symptoms on parenting behaviour among mothers in Japan. *Child: Care, Health & Development*, 38(4), pp. 530-537.

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E. and Janson, S. (2009) Burden and consequences of child maltreatment in high-income countries. *The Lancet*, (9657), pp. 68-81.

Gray, D. and Watt, P. (2013) *Giving Victims a Voice. Joint Report into Sexual Abuse Allegations made Against Jimmy Savile*, London: NSPCC and MPS.

Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M. and Kessler, R. C. (2010) Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: associations with first onset of DSM-IV disorders. *Archives of general psychiatry*, 67(2), pp. 113-123.

Gunnar, M. and Quevedo, K. (2007) The neurobiology of stress and development. *Annual Review of Psychology*, 58, pp. 145-173.

Hackman, D. A., Farah, M. J. and Meaney, M. J. (2010) Socioeconomic status and the brain: mechanistic insights from human and animal research. *Nature Reviews Neuroscience*, (9), pp. 651-659.

Institute for Health Metrics and Evaluation (IHME) (2013) *Global Burden of Disease Country Profiles*, Available: <http://www.healthmetricsandevaluation.org/gbd/country-profiles> [Accessed 26th August 2013].

Johnson, S. B., Riley, A. W., Granger, D. A. and Riis, J. (2013) The science of early life toxic stress for pediatric practice and advocacy. *Pediatrics*, (2), pp. 319-327.

Kendall-Tackett, K. A. (2003) *Treating the lifetime health effects of childhood victimization*, Kingston, NJ : Civic Research Institute.

Kilburn, M. R., Karoly, L. A., Labor, R. and Population (2008) *The Economics of Early Childhood Policy: What the Dismal Science Has to Say about Investing in Children.*: RAND Corporation.

Krugman, S. D., Lane, W. G. and Walsh, C. M. (2007) Update on child abuse prevention. *Current Opinion in Pediatrics*, 19(6), pp. 711-718.

Leserman, J. (2005) Sexual abuse history: Prevalence, health effects, mediators, and psychological treatment. *Psychosomatic Medicine*, 67(6), pp. 906-915.

Masten, A. and Wright, M. (2009) Resilience over the lifespan: Developmental perspectives on resistance, recovery, and transformation. in Reich, J., Zautra, A. and Hall, J., (eds.) *Handbook of adult resilience*, New York: Guilford. pp. 213-237.

McCrary, E., De Brito, S. A. and Viding, E. (2010) Research Review: The neurobiology and genetics of maltreatment and adversity. *Journal of Child Psychology & Psychiatry*, 51(10), pp. 1079-1095.

Mehta, D., Klengel, T., Conneely, K. N., Smith, A. K., Altmann, A., Pace, T. W., Rex-Haffner, M., Loeschner, A., Gonik, M., Mercer, K. B., Bradley, B., Müller-Myhsok, B., Ressler, K. J. and Binder, E. B. (2013) Childhood maltreatment is associated with distinct genomic and epigenetic profiles in posttraumatic stress disorder. *Proceedings of the National Academy of Sciences*, 110(20), pp. 8302-8307.

Munro, E., Taylor, J. S. and Bradbury-Jones, C. (2014) Understanding the Causal Pathways to Child Maltreatment: Implications for Health and Social Care Policy and Practice. *Child Abuse Review*, (1), pp. 61-74.

National Council on Child Abuse and Family Violence (2013) *Child Abuse Information [online]*, Available: <http://www.nccafv.org/child.htm> [Accessed 14th July 2013].

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J. and Vos, T. (2012) The Long-Term Health Consequences of Child Physical Abuse, Emotional Abuse, and Neglect: A Systematic Review and Meta-Analysis. *PLoS Medicine*, 9(11), pp. 1-31.

Olds, D. L., Sadler, L. and Kitzman, H. (2007) Programs for parents of infants and toddlers: recent evidence from randomized trials. *Journal of Child Psychology and Psychiatry*, 48(3-4), pp. 355-391.

Rutter, M. (2006) Implications of Resilience Concepts for Scientific Understanding. *Annals of the New York Academy of Sciences*, 1094(1), pp. 1-12.

Rutter, M. (2007) Gene–environment interdependence. *Developmental science*, 10(1), pp. 12-18.

Sachs-Ericsson, N., Blazer, D., Plant, E. A. and Arnow, B. (2005) Childhood sexual and physical abuse and the 1-year prevalence of medical problems in the national comorbidity survey. *Health Psychology*, (1), pp. 32-40.

Seng, J. S., Low, L. K., Sparbel, K. J. and Killion, C. (2004) Abuse-related post-traumatic stress during the childbearing year. *Journal of advanced nursing*, 46(6), pp. 604-613.

Shonkoff, J. P. (2010) Building a New Biodevelopmental Framework to Guide the Future of Early Childhood Policy. *Child Development*, 81(1), pp. 357-367.

Thornberry, T. P., Henry, K. L., Ireland, T. O. and Smith, C. A. (2010) The Causal Impact of Childhood-Limited Maltreatment and Adolescent Maltreatment on Early Adult Adjustment. *Journal of Adolescent Health*, 46(4), pp. 359-365.

Tyrka, A. R., Price, L. H., Marsit, C., Walters, O. C. and Carpenter, L. L. (2012) Childhood Adversity and Epigenetic Modulation of the Leukocyte Glucocorticoid Receptor: Preliminary Findings in Healthy Adults. *PLOS ONE*, 7(1), pp. 1-8.

United Kingdom Faculty of Public Health (2014) *Start Well, Live Better - a manifesto for the public's health*, London: UK Faculty of Public Health.

Van der Lee, J. H., Mokink, L. B., Grootenhuis, M. A., Heymans, H. S. and Offringa, M. (2007) Definitions and measurement of chronic health conditions in childhood - A systematic review. *JAMA- Journal of the American Medical Association*, 297(24), pp. 2741-2751.

Williamson, D. F., Thompson, T. J., Anda, R. F., Dietz, W. H. and Felitti, V. (2002) Body weight and obesity in adults and self-reported abuse in childhood. *International Journal of Obesity & Related Metabolic Disorders*, 26(8), pp. 1075-1082.

Wilson, D. R. (2010) Health Consequences of Childhood Sexual Abuse. *Perspectives in Psychiatric Care*, 46(1), pp. 56-64.

World Health Organization (2002) *Innovative care for chronic conditions : building blocks for action*, Geneva: WHO.

Yang, B.-Z., Zhang, H., Ge, W., Weder, N., Douglas-Palumberi, H., Perepletchikova, F., Gelernter, J. and Kaufman, J. (2013) Child Abuse and Epigenetic Mechanisms of Disease Risk. *American Journal of Preventive Medicine*, 44(2), pp. 101-107.

Table 1: Start Well, Live Better (Adapted slightly from UK Faculty of Public Health, 2014)

Give every child a good start in life

Give all babies the best possible start in life

Help children and young people develop essential life skills and make Personal, Social, Health and Economic, and Sex and Relationship Education a statutory duty in all schools

Promote healthy, active lifestyles in children and young people by reinstating at least 2 hours per week of physical activity in all schools

Introduce good laws to prevent bad health and save lives

Protect our children by stopping the marketing of foods high in sugar, salt and fat before the 9 pm watershed on TV, and tighten the regulations for online marketing

Introduce a 20% duty on sugar-sweetened beverages as an important measure to tackle obesity and dental caries—particularly in children

Tackle alcohol-related harm by introducing a minimum unit price for alcohol of at least 50 p per unit of alcohol sold

Save lives through the rapid implementation of standardised tobacco packaging

Set 20 mph as the maximum speed limit in built-up areas to cut road deaths and injuries, and reduce inequalities

Help people live healthier lives

Enable people to achieve a good quality of life, health and wellbeing—give everyone in paid employment and training a 'living wage'

Reaffirm commitment to universal healthcare system, free at the point of use, funded by general taxation

Take national action to tackle a global problem

Invest in public transport and active transport to promote good health, and reduce our impact on climate change

Implement a cross-national approach to meet climate change targets, including a rapid move to 100% renewables and a zero-carbon energy system