

BACAPH response
to
Men's Health Strategy for England: call for evidence
“a shift from intervention to prevention”

Narrative hypothesis.

“Just as with the differences disadvantaging females, health differences affecting males, such as road injuries and ischaemic heart disease, often have their roots early in life, highlighting the importance of interventions and preventive measures that get implemented from a young age.”¹

The origins of adult male health and their patterns of health service use are largely established during the first 18-25 years. One of the best predictors of adult resilience, health and well-being is educational achievement which itself has a strong correlation with “school readiness”. Investment in intervention programmes and health services that support optimal early child development, especially for boys, have a significant return on investment ascertained by adult quality-of-life, morbidities and duration of life.^{2 3}

Improved educational achievement is linked to better health judged by nutrition, quality of relationships and the use of preventative health services all resulting in reduced morbidity, particularly later life cognitive issues, mental ill-health, number of hospital admissions and long-term disability. These benefits are mediated through individual health literacy impacting upon behaviour and lifestyles, income and subsequently improved access to positive determinants of health including housing, transport and the natural environment.

While boys are on average born heavier than girls [by about 100 g] more boys are born premature, have low Apgar scores and more neonatal complications. In childhood they are more prone to asthma, injuries and infectious disease. Autism, ADHD and Tourette’s syndrome together with behaviour and mental health problems partly explain increased later risk-taking, substance misuse and suicide during adolescence and young adulthood. It is not fully understood how biological, social and environmental determinants interact to explain these sex differences nor how, when and where to best intervene to improve outcomes. [See appendices for mechanisms of action]

However, all the evidence points towards early and sustained parenting support and enriched early years environments followed by early assessment and effective support for concerns around behaviour and development during the school years are key components of successful longitudinal programmes. Likewise interventions to support positive mental health during the adolescent years,

¹ Ref, Patwardhan et al, 2024 Lancet Public Health . 2024 May 1;9(5):e282–e294. doi: [10.1016/S2468-2667\(24\)00053-7](https://doi.org/10.1016/S2468-2667(24)00053-7)

² Ref. Campbell et al. **Early childhood investments substantially boost adult health.** Science. 2014 Mar 28;343(6178):1478–1485. doi: [10.1126/science.1248429](https://doi.org/10.1126/science.1248429)

³ Gabriella Conti, James J. Heckman, Rodrigo Pinto. The effects of two influential early childhood interventions on health and healthy behaviors. <http://www.nber.org/papers/w21454>

both at a population level and an individual level are essential to reduce the burden of mental ill health seen throughout adulthood.

Overall, some 60% of all adult male morbidity is established during the childhood period. Any future men's health strategy should therefore start with a focus on boys in childhood. Many of the population-based interventions will also benefit by girls and women so this investment will enhance the health of the whole future generation. Let's make "today's decisions for tomorrow's children" a positive reality.⁴

Why intervene during childhood?

Why this is important

- Developmental aspects-growth, development, behaviour, cognition. Health gains accrue across the life course.
- Opportunities for change exist at many levels - parental, societal, individual.
- Large return on investment.
- A human rights and equity issue. Politics and prevention! NHS Long-Term Plan, 10 year plan priority.

Unique aspects of childhood.

- physical, physiology,
- social, emotional development,
- cognitive,
- physical growth of biological organ systems.

For example, 60% of resting metabolic rate is cerebral function in early childhood. Nutrition is essential for optimal brain development; poor nutrition has long-term impacts on cognitive function⁵. Likewise, exposure to early toxins for example nicotine and alcohol in utero have a long-term impact on cerebral neuro-development. Interventions need to be timed to have maximum effect on the developing child.

Four ages and stages of childhood

- Infancy
- Childhood
- Adolescence
- Young adulthood

Four sentinel conditions

Four major conditions were chosen to illustrate the approach that interventions [priorities] will vary depending on maturity of different biological systems with age.

- Obesity/cardiovascular disease
- Injury

⁴ [Rachel Margolis](#) Childhood Morbidity and Health in Early Adulthood: Life course linkages in a high morbidity context. Adv Life Course Res. 2010 Dec 1;15(4):132–146. doi: [10.1016/j.alcr.2010.10.001](https://doi.org/10.1016/j.alcr.2010.10.001)

⁵ See appendices for detail.

- poor mental health/mental health/relationships plus intergenerational impacts
- unhealthy behaviours/masculinity impact on others. NEET

	Obesity/CVD	Injury	MH	Male roles
Infancy	+++		+	+
Childhood	+++		++	++
Adolescence	++	+++	+++	+++
Young adult	+	++	+++	+++

Table 1: age versus morbidity (+indicates optimal time periods for interventions)

Gender differences (school readiness-as a detailed example)

Key Findings:

In England, there are significant gender differences in "school readiness" as measured by the Early Years Foundation Stage (EYFS) assessment.

Girls consistently outperform boys in school readiness assessments. In 2023–24, 75% of girls achieved a good level of development (GLD) compared to a lower proportion of boys. Equity. The gender gap is especially pronounced among disadvantaged groups. For example, among children eligible for free school meals (FSM), around 60% of girls achieved GLD versus just 43% of boys—a gap of 17 percentage points.

⁶This gap is observed across all early learning goals, with girls ahead in literacy, language, and writing abilities. In 2018, the difference in achievement between girls and boys was reported as 14.3%. The overall gender gap at age 5 (reception year) was 3.2 months in 2022, having increased from 2.9 months in 2019. Trends. The gender gap has persisted for over a decade, though there was narrowing between 2013 and 2019 before widening again post-pandemic. Boys are more likely to be identified as having special educational needs and are over-represented among those not in education, employment, or training later in adolescence.

Educational strategies to reduce the gender achievement gap in early years education.

1. Gender-responsive and transformative curriculum.

Redesign curricula to explicitly challenge gender stereotypes and promote equal participation in all activities for boys and girls. Use gender-neutral language and groupings (e.g., referring to groups by colours or themes rather than “boys” and “girls”)⁷

2. Gender-responsive teacher training.

Provide teachers with training to recognize and counteract their own gender biases, and to implement gender-responsive teaching methods. Encourage mixed-ability and mixed-gender groupings to foster cross-gender friendships and equal learning opportunities. Rotate play stations

⁶ Sophie Metcalfe | Nehal Davison School readiness How can government start closing the opportunity gap in early years education? https://www.instituteforgovernment.org.uk/sites/default/files/2025-03/school-readiness-policy-making-left-behind-groups_1.pdf#:~:text=%E2%80%A2%20A%20significant%20gender%20gap%20also%20exists%2C,development%20compared%20to%20just%2043%25%20of%20boys.

⁷ Gender equal play in early learning childcare. Care Inspectorate. <https://hub.careinspectorate.com/media/3466/gender-equal-play-in-early-learning-and-childcare.pdf>

and offer activities that challenge traditional gender roles, giving all children access to a wide range of experiences.

3. Workforce development.

Recruit a more gender-balanced workforce in early years settings to provide diverse role models and challenge stereotypes about who can work with young children. Improve employment conditions and professional development for early years staff to retain high-quality educators.

4. Family and community engagement.

Educate caregivers about gender-transformative parenting and involve fathers or male caregivers in early years education. Engage families and communities in conversations about gender equality and the importance of challenging stereotypes from an early age.

5. Quality assurance and data monitoring.

Implement gender-responsive quality standards and regularly assess progress using gender data. Ensure that planning and budgeting in early years education allocate resources equitably between boys and girls.

6. Structured and inclusive learning environments.

Use more structured curricula and collaborative activities, such as small group work and peer tutoring, to support all learners and reduce gaps. Create gender-neutral play spaces and learning materials to encourage equal participation. These strategies should be implemented as part of a coherent, system-wide approach to ensure lasting impact on gender equality in early years education.

Policy implications of early interventions.

Positive, nurturing, and emotionally supportive parenting is linked to healthier brain development. It promotes secure attachment, emotional regulation, and cognitive growth. For example, parental warmth and involvement are associated with beneficial changes in brain regions involved in emotion regulation, attention, and reward processing, such as the prefrontal cortex and orbitofrontal cortex. Sensitive parenting in early childhood supports early brain maturation and cognitive development.

Exposure to harsh, critical, or punitive parenting, especially in early childhood, can disrupt the organization of brain networks and is associated with increased risk for mental health issues like depression and anxiety. Harsh parenting may also lead to abnormal growth in brain regions involved in emotion processing and self-control, such as the amygdala and hippocampus.

The effects of parenting can vary depending on the child's age. Early childhood appears to be a particularly sensitive period, where parenting has broad and lasting impacts on the brain's communication networks. Later exposures may affect more specific brain areas.

Some effects of parenting on brain development differ between boys and girls, with certain brain regions and behavioural outcomes being more sensitive to parenting style in one sex

The influence of parenting styles extends into adolescence and adulthood, affecting not only brain structure but also cognitive abilities, emotional intelligence, and mental health resilience and

subsequently their ability to parent their own children. Warm, supportive, and consistent parenting fosters optimal brain development, while harsh or neglectful parenting can have lasting negative effects.

Practical aspects.

- Adequate intake of macronutrients and micronutrients are essential for optimal brain development and energy metabolism.
- Lack of sleep can increase brain energy consumption due to disrupted glucose regulation and increased metabolic demand.
- Supportive environments, physical activity, and stimulating experiences can influence both brain development and energy use.
- Early childhood experiences influence development of cognition in both positive and negative ways FaCEs and ACEs [Favorable Childhood Experiences versus Adverse Childhood Experiences].

Understanding life course pathways

A life course pathway approach is grounded in the principle that health, development and resilience are shaped by the cumulative interplay between biological, behavioural, and social factors across all stages of life, with critical sensitive periods, transitions and the timing and duration of exposures exerting lifelong impact. This concept of accumulating health or ill health starts with genetic predisposition which is then amplified by exposure to health determinants which may precipitate a recognized health problem which may then have negative consequences in terms of comorbidities, disability or resulting disadvantage, all contributing towards observed inequities of outcomes between genders. The opposite is true for exposure to positive health determinants (assets).

An understanding of the mechanism of action of health determinants and behaviours throughout the life course is essential for designing policy interventions that influence outcomes over life course. It requires both synergy and alignment between population interventions and individual interventions.

	Complementary approaches	
Prevention	Population	Individuals
	DETERMINANTS	BEHAVIOURS
1	Predisposition	Contemplation
2	Susceptibility	Preparation
3	Presentation	Action
4	Consequences	Maintenance
Outcomes	Combined effect	

Childhood interventions that improve adult male health

High-Quality Early Childhood Programmes.

Intensive, high-quality early childhood interventions, such as the Carolina Abecedarian Project (ABC) have demonstrated substantial long-term health benefits for males. These programmes typically include enriched educational environments, nutritional support, and access to pediatric healthcare in the first five years of life.⁸

For males, participation in these interventions is associated with significantly lower systolic blood pressure in adulthood (e.g., 126 mm Hg in treated vs. 143 mm Hg in controls) Dramatically reduced prevalence of metabolic syndrome (none in the treated group vs. one in four in controls) Lower risk factors for cardiovascular and metabolic diseases in their mid-30s Healthier body mass trajectories and reduced risk of obesity from early childhood through adulthood

Key Components of effective interventions.

- **Nutrition:** Programmes provided balanced meals and snacks during childcare, supporting healthy early growth and reducing the risk of later obesity
- **Health care:** Regular preventative care and immunisation, screenings and access to well-child and sick-child care contributed to early detection and management of health issues
- **Enriched environment:** Structured play, cognitive stimulation, and emotional support fostered the development of cognitive and noncognitive skills, which are linked to healthier behaviours and better health outcomes in adulthood
- **Parental engagement:** Some interventions included components to support parenting skills and home environments, further enhancing child development

Mechanisms and lasting effects

- The health benefits for males appear to be mediated by a combination of improved early nutrition, access to healthcare and the development of cognitive and noncognitive skills (such as self-regulation and social skills)
- These early advantages persist into adulthood, reducing the prevalence of risk factors for chronic diseases and promoting healthier lifestyles

Other relevant approaches

- Addressing trauma, supporting mental health, encouraging safe behaviours, and promoting physical activity from an early age are also recommended to improve long-term male health outcomes
- Community and school-based programmes that reinforce healthy routines, stress management, and risk avoidance can further support positive adult health trajectories

Summary Table: Key Interventions and Outcomes

Intervention Component	Adult Male Health Outcome
Early childhood education	Lower blood pressure, reduced metabolic syndrome

⁸ Carolina Abecedarian Project (ABC) <https://abc.fpg.unc.edu/> and the Perry Preschool Programmes https://cehd.uchicago.edu/?page_id=958,

Nutrition support	Healthier BMI, reduced obesity risk
Access to healthcare	Fewer chronic disease risk factors
Cognitive/noncognitive skill development	Healthier behaviours, better stress management
Parental and community support	Enhanced long-term physical and mental health

Economic Returns

High-quality childhood interventions demonstrate strong cost-effectiveness for improving adult health, with returns often exceeding initial investments:

13% annual return for birth-to-age-5 programmes (e.g., Abecedarian Project), driven by reduced healthcare costs, increased lifetime earnings, and lower welfare dependency

\$10.83 societal return per \$1 invested in the Child-Parent Center programmes, with public benefits (tax revenues, reduced crime) accounting for 85% of gains

Median cost-utility ratio of **\$7,300/QALY** for pediatric interventions vs. \$26,000/QALY for adult programmes, indicating greater efficiency

Key Cost-Effective Models

1. **Early education programmes** (e.g., Perry Preschool): \$2-\$4 returned per \$1 invested via reduced chronic disease risks and improved economic productivity.
Integrated health/education interventions: Reduced metabolic syndrome and hypertension in adulthood, cutting long-term cardiovascular care costs.
Mental health prevention: School-based CBT programmes show **\$13,586/QALY** for depression prevention, often becoming cost-saving over 10+ years.
3. **Drivers of Efficiency**
Early risk reduction lowers later healthcare utilization (e.g., \$83,708 net benefits per preschool participant). Multi-component programmes simultaneously improves education, income and health behaviours. Parental involvement amplifies intergenerational benefits, reducing future intervention needs. While upfront costs range from **\$150-\$48,800** per family depending on intensity, longitudinal data confirm net positive returns within 15-25 years.

Conclusions

Investing in high-quality, comprehensive early childhood interventions-especially those targeting disadvantaged populations-can yield significant, long-lasting health benefits for males, including lower rates of cardiovascular and metabolic diseases, healthier weight trajectories, and improved health behaviours in adulthood intervention compare to other early childhood interventions in terms of cost-effectiveness.

Appendix 1. Mechanisms of action

Cerebral energy use in proportion to body energy use at rest use by age from 0-25 years

The brain's energy uses relative to resting metabolic rate (RMR) changes significantly from infancy to early adulthood:

Infancy (0-1 year): The brain consumes ~50-60% of RMR at birth, decreasing slightly in the first six months as body growth accelerates.

Early childhood (~4-5 years): Cerebral energy demand peaks at **66% of RMR** – nearly triple adult levels – coinciding with the slowest body growth rate. This period also shows the highest brain glucose uptake (43% of daily energy needs)

Late childhood to adolescence: Brain energy use gradually declines to ~40% of RMR by age 10 and approaches adult levels (~20% of RMR) by the late teens. This decline inversely correlates with pubertal growth spurts

Adulthood (by ~25): Stabilizes at ~20% of RMR, despite the brain constituting only 2% of body mass.

The energy demand is highest during periods of rapid synapse formation and elimination (especially ages 3–6), as well as myelination and neurogenesis. These processes are energetically costly and drive high brain energy use in early childhood.

The energetic costs of synapse formation and elimination in the developing brain are substantial due to the high metabolic demands of synaptic transmission and plasticity processes. Key points include:

Synaptic Transmission: Most brain energy is used at synapses, where processes such as ion fluxes, neurotransmitter release and reuptake, and vesicle cycling consume large amounts of ATP. Postsynaptic potentials alone can account for about 80% of the energy used in myelinated axons, highlighting the costliness of synaptic signalling

Synaptic Plasticity: Formation, strengthening, weakening, and elimination of synapses (synaptic plasticity) are metabolically demanding. Learning-related synaptic changes require energy for signalling, protein synthesis, transport, and structural remodelling. These processes involve both transient and persistent forms of plasticity, with consolidation of synaptic changes being particularly energy-intensive

Energy Costs Scale with Activity: The energy expenditure of a neuron depends on the number of synapses it maintains, their average use, and firing rates. Higher firing rates and synapse numbers increase both computational and communication energy costs, including action potentials which are ~100 times more costly than resting ion leak

Trade-offs in Development: Faster synaptic stabilization and development correlate with greater energy costs, indicating a balance between rapid brain maturation and metabolic expense

Overall Impact: Synapse formation and elimination contribute significantly to the brain's high energy consumption during development, as synaptic plasticity is a major driver of the brain's metabolic demands, especially in early life when synapse numbers peak and pruning occurs. The energetic costs of synapse formation and elimination arise primarily from the high ATP demands of synaptic signalling, plasticity-related molecular processes, and the maintenance of synaptic networks, making synaptic remodelling one of the most energy-intensive activities in the developing brain.

Appendix 2. Examples of long term benefits.

High-quality early childhood interventions, particularly those combining education, nutrition, and healthcare, show lasting benefits for adult male health. Key programmes include:

1. Carolina Abecedarian Project (ABC)

Provided intensive educational stimulation, healthcare, and nutrition from infancy to age 5

By mid-30s, treated males had **17.5 mmHg lower systolic blood pressure**, **11 mg/dL higher HDL cholesterol**, and **zero cases** of metabolic syndrome vs. 25% in controls.

2. Perry Preschool Project

Reduced smoking rates and behavioural risk factors by age 40.

3. Child-Parent Center (CPC) Preschool Programmes

Linked to lower rates of smoking, diabetes, and depressive symptoms by adulthood

Likely Mechanisms

- **Early-life nutrition/obesity prevention:** ABC participants had healthier weight trajectories in infancy, reducing metabolic risks
- **Cognitive/socioemotional skill development:** Enriched environments improved self-regulation and decision-making, fostering healthier lifestyles
- **Cumulative risk reduction:** Integrated interventions simultaneously addressed education, healthcare access, and chronic disease precursors (e.g., hypertension)
- **Intergenerational benefits** are also observed, as seen in Bangladesh's programmes improving participants' *and* their children's outcomes.
- **Childhood adversity** strongly correlates with poorer adult health outcomes through both direct biological pathways and cumulative psychosocial risks:
- **Mental Health**

Exposure to adverse childhood experiences (ACEs) like abuse, neglect, or household dysfunction **quadruples the risk** of adult mental disorders (e.g., depression, anxiety, psychosis).

Negative school experiences (e.g., bullying, low belonging) amplify ACE effects: 44% of adults with ≥ 4 ACEs and poor school environments had current mental illness vs. 19% with positive school experiences

Physical Health

ACEs increase risks for **cardiovascular disease**, **diabetes**, and **accelerated biological aging** linked to chronic inflammation and immune dysregulation) Cumulative adversity (e.g., abuse + poverty) raises obesity risk by 20-50% and cardiovascular disease risk threefold

Mechanisms Chronic stress: Prolonged cortisol exposure alters brain development, metabolic function, and immune responses

Health behaviours: ACEs correlate with higher rates of smoking, substance use, and poor self-care

Social cascades: Adversity reduces educational/economic opportunities, perpetuating health inequities

Intergenerational Impact

Partners of individuals with ACEs face elevated health risks, suggesting adversity's effects extend beyond direct exposure

Appendix 3. Gender differences in brain development throughout childhood.

Structural differences: Male brains are, on average, larger than female brains from birth, but when adjusted for total brain size, females have more grey matter (involved in processing and cognition), while males have more white matter (involved in connectivity and communication between brain regions). Boys' brains are also more lateralized, meaning the hemispheres operate more independently, while girls' brains tend to use both hemispheres more symmetrically, especially for language tasks

Developmental timelines: Girls generally reach developmental milestones earlier than boys, including language, fine motor skills, and social awareness. Girls' brains tend to finish growing earlier, while boys often catch up or surpass in certain spatial skills by age three

Functional differences: In early childhood, females often perform better in executive functioning, language, and emotional recognition, while males may excel in visual-spatial tasks as they get older. Functional connectivity differences in the brain are linked to behaviour and tend to be region-specific, especially in the prefrontal cortex

Synaptic and connectivity differences: Studies show men may have greater synaptic connectivity in certain brain regions, which could underlie some cognitive and behavioural differences

Parental and environmental influences: Prenatal and early-life hormone levels,

Parenting styles significantly influence brain development throughout childhood and adolescence, shaping both brain structure and function.