An introduction to early life and later disease

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Early life and later disease

- history – back to the 1980s and beyond
- inequalities in health
- early experience: insights from epidemiological studies: prenatal life
- early experience: insights from epidemiological studies: infancy & early childhood
- taking a lifecourse approach: ‘memories’ of early life and mechanisms
- relevance for today?
Background: 1980s

- cardiovascular disease (coronary heart disease and stroke) leading causes of death in UK
- distribution and time trends
Background: 1980s

Standardised CHD mortality rates 1970-89 in European countries (Committee on Medical Aspects of Food Policy, *Nutritional Aspects of Cardiovascular Disease*, 1994)
Standardised mortality ratios for coronary heart disease among men aged 35-74 (1968-78)

Barker DJP (1998) Mothers babies and health in later life
Coronary heart disease mortality (1979-83) for men in England & Wales, according to social class.
coronary heart disease
Early life and later disease

- a role of events earlier in the lifecourse?
- could cardiovascular disease be linked to adverse influences in childhood?
- effects of growing up in poverty?
Correlation between current mortality rate for heart disease in Norwegian counties (1964-67) in men, and past infant mortality rates (1896-25)

Deaths from arteriosclerotic heart disease/100,000 per year

Infant mortality 1896-1925

Infant mortality
(1901-10)

Barker DJP (1998) Mothers babies and health in later life
Standardised mortality ratios for coronary heart disease in men during 1968 - 78 and infant mortality rate during 1921-25 in England and Wales

Barker DJP & Osmond C (1986) JECH 40:37
The Hertfordshire Cohort Study 1911-1948
Standardised mortality ratios for coronary heart disease below 65 years, according to birthweight (Hertfordshire)

Osmond et al BMJ 1993;307:1519
Cumulative incidence of coronary artery disease in men and women born before the Dutch Hunger Winter famine, exposed in early, mid or late gestation, or conceived after the famine.

Painter et al. Am J Clin Nutr 2006;84:322
Risk of coronary heart disease in men, according to ponderal index at birth: Helsinki cohort 1924-33

Eriksson et al BMJ 1999;318:427
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- prenatal vs postnatal experience?
Growth of boys who later developed coronary heart disease: Helsinki cohort 1934-44

Barker et al (2005) NEJM 353:17
Programming

‘an event at a critical time in development, which permanently alters structure and function’

Lucas 1991
Systolic blood pressure of female offspring of rats fed diets of differing protein content during pregnancy

Casein content of maternal diet

Brain growth spurt: ‘a period of enhanced vulnerability to nutritional and other growth restriction’
Epigenetics

Two main components of the epigenetic code – DNA methylation and histone modification.

These processes can affect gene expression, and hence development and phenotypic characteristics, without altering the genomic DNA code itself.
Early life and later disease

- relevant today?
Findings from the Southampton Women’s Survey

- 1 family in 5 was food insecure

- young children growing up in food insecure homes had poorer diets – characterised by greater consumption of refined cereals, processed meat, chips, crisps and soft drinks – and lower consumption of wholegrain cereals and vegetables

- dietary patterns ‘track’ from mother to child – and throughout childhood

Pilgrim et al J Epidemiol Community Health 2012;66:e6
‘The life-course approach suggests that many of the risk and protective factors that influence health and wellbeing across the lifespan also play an important role in birth outcomes and in health and quality of life beyond the initial years’
‘The future health and wellbeing of the UK is linked to how successfully we manage the health and wellbeing of today’s children’.

BMA Board of Science May 2013