The Generational Health Drift: Evidence from the British birth cohort studies

Laura Gimeno[1], Darío Moreno Agostino[1], Martin Danka[1], Yiling Guo[1], Alice Goisis[1], Jennifer Dowd[2], George Ploubidis[1]*

[1]Centre for Longitudinal Studies, University College London, London, UK

[2]Leverhulme Centre for Demographic Science, Nuffield Department of Population Health, University of Oxford, Oxford, UK.

*Presenting author

ABSTRACT

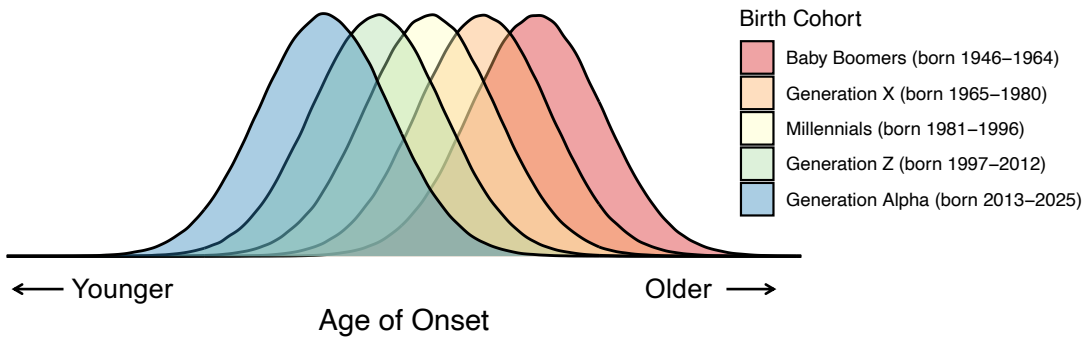
Improving health and care has been at the forefront of election campaigns and manifestos for decades, with political parties repeatedly pledging to improve GP waiting times, A&E response rates and access to social care. Declines in mortality have typically been associated with improvements in physical health across successive generations. While life expectancy in most high-income countries continues to increase, evidence from the British birth cohorts and longitudinal research suggests that more recently born generations are living longer, but in worse health. Younger generations are suffering from worse mental health, and a higher prevalence of diabetes, asthma, and obesity compared to older generations, even when these comparisons are made at the same age. This earlier onset and decline in general health is something we term "generational health drift" and has considerable consequences for population ageing and the economy. Given improvements in life expectancy over the 20th Century, increasing the number of years spent in good health is essential to supporting an ageing population. The observed trends of increased prevalence and earlier onset of chronic physical and mental ill-health reflect changes in social and environmental exposures and are therefore preventable.

BACKGROUND

Improving health and care has been at the forefront of election campaigns and manifestos in the United Kingdom (UK) for decades, with political parties repeatedly pledging to improve waiting times in primary care, emergency care response times, and to increase access to social care. The UK is also facing the challenge of population ageing (an estimated 18.6% of the UK population was aged ≥65 years in 2020/21)[1] with considerable implications for demand for healthcare and for the economy.[2] Improving health across generations is crucial to face these challenges.

There are several ways to explore whether more recent cohorts are living longer and in better health. One common approach involves looking at period or cohort trends in health expectancies.[3] An alternative to this actuarial approach is to ask whether people born more recently are in better health at the same age for a broad set of health outcomes. Theoretically, this would involve comparing the distribution of age at chronic disease or disability onset across several generations (**Figure 1**). However, data requirements to engage in this comparative work are difficult to meet. Another way of operationalising this is to compare the population prevalence of poor health at the same age across cohorts. This approach is well suited to survey data, which typically collects information about whether cohort members have specific health conditions across the lifecourse.

Figure 1. *Graphical description of "Generational Health Drift"*



Here, we present findings from a review of publications which have compared the prevalence of poor health (general, physical, and mental) across Britain's unique collection of birth cohort studies, and argue that the UK is experiencing a "generational health drift" for a diverse set of health outcomes, with more recent post-war generations exhibiting higher prevalences of poor health compared to their predecessors at the same age.[4,5] Documenting these trends is an important first step towards understanding what might explain this "generational health drift" in post-war cohorts. The lifecourse perspective argues that differences in health are the result of exposures across the lifecourse.[6] The British birth cohort studies, which have followed people from different post-war generations (born 1946, 1958, 1970, early 1990s, early 2000s) since they were born, are a resource uniquely placed to explore the question of why a "generational health drift" is occurring from a lifecourse perspective.

METHODS

The methodology for this systematic review was registered on PROSPERO (registration number CRD402024560326). Briefly, we searched for publications which used two or more of the following datasets: the 1946 National Survey of Health and Development (NSHD),[7] the 1958 National Child Development Study (NCDS),[8] the 1970 British Cohort Study (BCS70),[9,10] the Avon Longitudinal Study of Parents and Children (ALSPAC),[11] Next Steps (formerly the Longitudinal Study of Young People in England),[12] and the Millennium Cohort Study (MCS).[13] These studies have collected data on people born in Britain in 1946, 1958, 1970, the early 1990s, and early 2000s. To be included, publications had to use at least two of the studies above, focus on health conditions (excluding health behaviours, contact with healthcare system), and compare health at the same or similar ages (3 years apart or less). After screening and data extraction by two reviewers, publications were assessed for quality using the Jonna Briggs Institute's critical appraisal tool for use in systematic reviews addressing questions of prevalence.[14] We additionally considered how authors had handled attrition and missing data.

PRELIMINARY FINDINGS

In **Table 1**, we summarise the evidence on comparisons of health for a subset of 20 papers which focused specifically on cohort differences in health.[7,15–33] We also identified papers which focused on comparing associations between exposures and health outcomes (mostly body mass index and psychological distress) across studies, rather than the prevalence of health outcomes themselves, but which reported prevalence as part of their descriptive results. The direction of

cohort differences in prevalence aligned with those from studies explicitly addressing change in health across cohorts. Most studies showed evidence for increasing prevalence of poor health across successive cohorts, or no change. Improvements in health were only observed for a small number of outcomes. Evidence on cohort comparisons of health was most abundant for anthropometric measures (especially body mass index) and psychological distress, with papers not only comparing prevalence at specific ages, but also describing age-trajectories. Most evidence on chronic disease was self-reported, though a number of papers did assess cohort differences in biomarkers closely associated with specific self-reported conditions (e.g., diabetes and glycated haemoglobin). Evidence on cohort comparisons of disability was limited.

Table 1. *Age-for-age comparisons of health outcomes across the British birth cohort studies.*

Outcome	Results	Age measured	Cohort studies
Self-rated health	🔴	23/26 to 42	1958, 1970
Limiting longstanding illness	🔴	30/33	1958, 1970
Anthropometric measures			
BMI, obesity, overweight	🔴 🔴 since 1970	20s to 40s 10/11	1946, 1958, 1970, 1990s, 2000s 1946, 1958, 1970, 2000s
Waist circumference	🔴	44/46/47	1946, 1958, 1970
Birthweight	🔴 🟡	0 0	1946, 1958, 1970 1958, 1970
Self-reported chronic morbidity			
Migraines/Headaches	🔴	42	1958, 1970
Asthma/Bronchitis	🔴	42	1958, 1970
Asthma	🔴 🔴 🔴	42/43 30/33/36 10/11	1946, 1958 1946, 1958, 1970 1970, 2000s
Bronchitis	🟢 🟡	42 30/33/36	1946, 1958 1946, 1958, 1970
Fits, convulsions, or epilepsy	🔴	42	1958, 1970
Diabetes	🔴 🔴	42 30/33/36	1946, 1958 1946, 1958, 1970
High blood pressure	🔴 🔴 1946 to 1958	42 30/33/36	1946, 1958 1946, 1958, 1970
Cancer	🟡 🟡 🟡	42 42/43 30/33/36	1958, 1970 1946, 1958 1958, 1970
Multimorbidity[1]	🔴	42	1958, 1970
Poor mental health			
Psychological distress	🔴 since 1970 🔴	42/43 20s to 40s	1946, 1958, 1970 1958, 1970
Emotional problems	🔴 🔴 🟡	16/17 9 7	1958, 1970, 1990s, 2000s 1990s, 2000s 1958, 1990s, 2000s
Life satisfaction	🔴	25/26	Born 1970, Next Steps
Biomarkers			
Glycated haemoglobin (HbA1c)	🔴	44/46	1958, 1970
Blood pressure (accounting for medication use)	🟡	44/46	1946, 1958, 1970
Low HDL-cholesterol	🔴	44/46/47	1958, 1970

Note: 🔴 Younger cohorts in worse health. 🟡 No evidence for change in health across cohorts. 🟢 Younger cohorts in better health. [1]Multimorbidity is two or more if the following: self-reported cancer, migraine/severe headaches, asthma/bronchitis, convulsions/epileptic seizures/fits, or diabetes, observer-measured hypertension or diabetes based on HbA1c, or psychological distress.

DISCUSSION

For nearly all health outcomes considered in this review, the prevalence of poor health either increased or remained similar across successive cohorts at comparable ages. We refer to the trend of worsening health in younger cohorts compared to their predecessors at the same age as the "generational health drift".[4] Evidence for worse health in younger cohorts was particularly abundant for obesity and poor mental health. Comparisons with published studies on cohort differences in heath in Britain using other datasets (e.g., repeated cross-sectional studies, longitudinal studies of the older population) and on age-specific trends in the prevalence of chronic disease are generally consistent with findings from the cohorts.[4,34,35] Given the increases in life expectancy that have been observed across these cohorts, anything but a declining age-specific prevalence of morbidity is implies longer time spent in poor health in younger cohorts, which has important implications for society.

For health outcomes where repeated measures are available, the British birth cohorts provide an opportunity to see how cohort differences in prevalence have changed by age. For instance, differences in obesity and poor mental health are apparent across cohorts that have reached adulthood, but these differences were not apparent in childhood or adolescence until the most recently born cohorts. Changes in health across cohorts reflect the different timing and duration of exposure to risk factors across the entire lifecourse. The "generational health drift" is a consequence of how social change has shaped the environments cohort members have been exposed to throughout their lives, and these social changes have resulted in biological (health) change across cohorts.

Many outcomes considered in the review were self-reported, and it is possible that health may be reported differently across cohorts due to changes in screening and diagnosis practices, increasing health-awareness, and declines in stigma of reporting certain health outcomes. This concern is especially relevant for asymptomatic conditions that require testing to be diagnosed, and mental health. While the impact of such changes affecting reporting cannot be ruled out, observer-measured outcomes (e.g., blood biomarkers) generally support findings from self-reports. Mental health is measured using validated questionnaires, and methodological work on the British birth cohorts has established that members of different studies interpret the items of these questionnaires similarly.{Citation}.[15] A current challenge of cross-cohort health comparisons is the need for comparable data on health outcomes, which often requires retrospective harmonisation. Prospective harmonisation of questionnaires is increasingly being undertaken in new data collection sweeps to allow for age-for-age comparisons across the British birth cohort studies.

Changes in mortality could partly explain increasing prevalence of chronic morbidity at the same age in younger cohorts but is unlikely to be the major cause except for some outcomes closely associated with mortality (e.g., cancer). Cohort differences in health are often observed by early adulthood, at ages where mortality has been low for many decades now, and for conditions which are only loosely associated with mortality. However, research exploring what *is* driving "generational health drift" from a lifecourse perspective is limited. The British birth cohort studies, which have prospectively collected information on many aspects of cohort members lives since they were born (socioeconomic, demographic, health-related) offer a unique opportunity to explore this pressing question.

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