Terence Dwyer,
Professor of Epidemiology, University of Oxford

«Advancing knowledge about childhood diseases through large birth cohort studies – Insights from the US National Children's Study and other recent cohorts on opportunities and challenges»

Research in humans on early life origins of disease has principally used prospective cohort studies to gain insights into causal pathways. When such studies are used to examine associations with disease endpoints rather than biological or social intermediates, the studies have to be very large to provide the necessary power to examine associations. As a consequence, needed research on either childhood diseases or on early life origins of adult disease have either not been done, or they have been attempted using routinely collected datasets that can only partly address questions of interest.

To overcome this major barrier to understanding causes of childhood disease, several countries have established very large birth cohorts with measurement of a broad range of exposures from pregnancy onward and collection of biospecimens. These include those from Denmark (DNBC), Norway (MOBA) which have each recruited approximately 100,000 mothers and babies. The US Government set out to also recruit 100,000 participants for the planned National Children's Study, but NIH closed it down after enrolling just a small fraction of the anticipated sample. The experience of the National Children's study highlighted how difficult it can be to successfully undertake projects of this kind.

Those studies that have been mounted successfully are now producing valuable evidence on certain outcomes. Even the largest, with 100,000 mothers and infants, are not, big enough, though, to provide useful evidence on rarer diseases. This can be overcome by the establishment of consortia to pool data from early life cohorts around the globe to examine endpoints that individual cohorts themselves had not envisioned were possible. One example is The International Childhood Cancer Cohort Consortium (I4C) which aims to provide the first adequately powered prospective dataset with biospecimens to investigate causes of childhood cancer. I will discuss how this consortium has assembled data already on 400,000 mothers and babies and will ultimately be able to examine data from 1 million children who will experience 2,500 childhood cancers. Findings are just starting to emerge from this global collaboration. Some of these results will be presented, and future opportunities discussed.