Institution: Institute of Education
Unit of Assessment: 25
Title of case study: Millennium Cohort Study: building a picture of a new generation

1. Summary of the impact (indicative maximum 100 words)

The Millennium Cohort Study (MCS) has influenced health policy and practice at local, national and international levels. Breastfeeding research based on MCS data has made a particularly important contribution to health education, and important insights have been provided on immunisation and obesity. The study has also helped to shape policy thinking and public discussion on issues such as social mobility, family poverty and child development. The MCS has not only created an invaluable resource for researchers in the UK and other countries, it has also served as a model for other cohort studies. Leading researchers around the world say it sets the benchmark against which other child cohort studies will be measured.

2. Underpinning research (indicative maximum 500 words)

Context: The MCS has been surveying more than 19,000 children born in the four UK nations in 2000/1. It has conducted 'sweeps' of the cohort at ages 9 months, 3, 5, 7 and 11 years and intends to follow them into adulthood. The study is based at the IOE and is managed by the Centre for Longitudinal Studies (CLS), an ESRC Resource Centre which also houses the 1958 and 1970 birth cohort studies. CLS staff produce a unique data resource for the national and international research community (see references **R1** and **R3**) and carry out their own analyses of MCS data. (**R5**). The MCS covers such diverse topics as parenting; childcare; school choice; child behaviour and cognitive development; child and parental health; parents' employment and education; income and poverty; housing and neighbourhood; social capital and ethnicity, and the growing fluidity of family structures. Its primary aims are to:

- collect detailed information over time on the life circumstances of the children
- trace links between their early life circumstances and later outcomes
- generate insights that will help to improve the health, development and wellbeing of future generations.

Key health findings based on MCS data: *Breastfeeding*: The age 9 months survey conducted by CLS revealed that breastfeeding rates were lowest in disadvantaged wards of the UK and highest in advantaged ones. The IOE researchers also gathered information on the health problems that had required MCS babies to be seen by a doctor or be treated in a hospital in their first eight months. A subsequent analysis of this data by researchers at Oxford University and University College London (UCL) showed that breastfeeding protects against hospitalisation for diarrhoea and lowers respiratory tract infection. This follow-up study of 15,890 full-term MCS babies estimated that if all UK infants were exclusively breastfed, the number hospitalised each month with diarrhoea would be halved, while respiratory infections admissions would be cut by a quarter **(R2)**. *Immunisation*: The age 3 survey, carried out soon after the scare over the combined MMR vaccination, found that 6% of children had not received any immunisation against measles, mumps and rubella. The combined MMR vaccine was given to 88% of the Millennium cohort children[1], while 6% received at least one vaccine separately. Within England, use of the combined MMR vaccine was highest in disadvantaged areas and in areas with a relatively high proportion of minority ethnic families. The CLS survey also showed that the association of maternal educational level with MMR is complex: mothers without qualifications or those with NVQ level 3 and above were more likely to have a completely unimmunised infant while those with higher educational qualifications were more likely to opt for at least one single vaccine. Later analysis, by a UCL team, of data on 14,578 of the MCS children confirmed that those in larger, less educationally advantaged families were more likely to receive the combined MMR vaccine **(R4)**. The researchers concluded that although MMR uptake in this cohort was high, a substantial proportion of children remained susceptible to avoidable infection, largely because parents consciously decide not to

[1] It is recommended that children receive the vaccine at 13 months.

immunise them, fearing the vaccine might be dangerous. One message from both the IOE and UCL analyses was that interventions to reduce incomplete immunisation need tailored approaches. *Overweight/obesity*: MCS children were weighed and measured at ages 3, 5 and 7. This enabled IOE researchers to calculate the proportion of girls and boys who were overweight or obese at these ages. Almost one in four of the MCS cohort was in one of these categories at age 3. Girls were more likely than boys to be overweight or obese at age 5 (23% of girls and 19% of boys) and at age 7 (23%, 18%). A higher proportion of seven-year-olds in Northern Ireland (24%) and Wales (23%) was overweight or obese than in England (20%) and Scotland (19%).

Survey methods: MCS children were selected through child benefit records to provide a representative sample of the total population, and to permit analysis and comparison of sub-groups. Children in the three smaller UK nations were intentionally over-sampled, as were those in areas of economic disadvantage or (in England only) high minority ethnic settlement. This approach allows analysis of these groups to achieve statistical power. The data quality is unusually high because the fieldwork is carried out to exacting specifications, it is preceded by thorough piloting, and the data are rigorously checked. After each survey the data are deposited in anonymised form with the UK Data Service, and are available to registered academic researchers.

3. References to the research (indicative maximum of six references)

R1: Dex, S. & Joshi, H. (2004) Millennium Cohort Study First Survey: A User's Guide to Initial Findings. London: CLS.

R2: Quigley, M., Kelly, T. & Sacker, A. (2007) Breastfeeding and hospitalization for diarrheal and respiratory infection in the UK MCS. *Pediatrics*, 119(4), e837-42.

R3: Hansen, K. & Joshi, H. (eds). (2008) Millennium Cohort Study, Second Survey: A User's Guide to Initial Findings. London: CLS.

R4: Pearce, A., Law, C., Elliman, D., Cole, T.J., Bedford, H. & the Millennium Cohort Study Child Health Group (2008) Factors associated with uptake of measles, mumps, and rubella vaccine (MMR) and use of single antigen vaccines in a contemporary UK cohort: prospective cohort study. *British Medical Journal*, 336: 754-757.

R5: Sullivan, A., Cara, O., Joshi, H., Ketende, S. & Obolenskaya, P. (2010) The consequences at age 7 of early childhood disadvantage in Northern Ireland and Great Britain. A report to the Northern Ireland Office of the First Minister and Deputy First Minister. London: IOE.

Indicative funding: The MCS received £23.7 million from the ESRC and government departments between 2000 and 2013.

Quality indicator: Professor James Williams, Co-director of the National Longitudinal Study of Children in Ireland, has said: "The MCS sets the benchmark against which other longitudinal child cohort studies will ultimately be measured. Its wide-ranging, multi-purpose design, coupled with scientific rigour, clearly makes the project a major national and international resource for policy-makers, child care practitioners and the research community alike". (*Email to IOE – available on request*)

4. Details of the impact (indicative maximum 750 words)

Principal beneficiaries and impact dates: Policy-makers, children, parents and society. MCS began yielding benefits before 2008 and they are increasing each year.

Reach and significance: MCS surveys have built up a uniquely detailed profile of the Millennium generation's diverse pathways through early childhood. The study is an exceptional resource for researchers, not only in the UK but around the world. It has also enabled policy-makers to target resources and interventions more effectively. MCS has achieved significant instrumental impacts[2] (i.e. influencing policy/practice). It has also had conceptual impacts (informing debates) and has helped to develop quantitative research expertise (capacity building impact). IOE academics who

[2]Nutley, S., Walter, I. and Davies, H. (2007) Using Evidence: How Research Can Inform Public Services. Bristol: Policy Press

manage the MCS and analyse its data maintain strong links with Westminster and devolved administration departments. Some of the following impacts stem from these close relationships.

Instrumental impact: *Breastfeeding*: The MCS-based research that found breastfeeding to be associated with lower hospitalisation rates for respiratory infections and child diarrhoea has been widely cited by health organisations, most notably in the National Institute for Health and Care Excellence (NICE) guidance on Maternal and Child Nutrition **(**see impact source **S1)** and other advice from the Department of Health **(S2)**. The finding is highlighted in nutrition guidelines and breastfeeding strategy documents published by many UK primary care trusts and in a breastfeeding information pack for children's centres issued in 2009 by the NCT (formerly the National Childbirth Trust), the UK's biggest parenting charity. The study is also cited by the British Dietetic Association in its 2013 policy statement on 'Complementary Feeding: Introduction of solid food to an Infant's Diet'. It has influenced health policies outside the UK too. The research has helped to underpin the South Australian government's policy on breastfeeding. It is also referred to in documents issued by Unicef UK on behalf of the Baby Friendly Initiative, a worldwide programme of the World Health Organization and Unicef which has been implemented in 134 countries.

Immunisation: The findings from MCS-based research have been used to inform both national and local policies on immunisation training programmes and practice. The research by Pearce et al **(R4)** was referred to in the 2009 NICE guidelines on how to reduce differences in the uptake of immunisations among children and young people **(S3)**. This authoritative guidance is for NHS and other professionals who work in children's services, local authorities, education and the wider public, private, voluntary and community sectors. Another important health education document that refers to MCS-based research on childhood immunisation was published by the King's Fund, the influential healthcare charity **(S4).**

Overweight/obesity: The MCS team's finding that 22% of Welsh three-year-olds were overweight and just over 5 per cent are obese has had a significant impact. In January 2010, the Assembly Government in Cardiff launched the 'All Wales obesity pathway' document – partly in response to this MCS finding. According to Children in Wales, a national umbrella organisation funded by the Assembly Government, the obesity prevention document was produced "further to evidence showing the proportion of adults and children who are not maintaining a healthy body weight is increasing". It then referred to the MCS obesity data **(S5)**. Health boards in Wales now use the pathway document as a tool to review local policies, services and cross-departmental multi-agency activity for children and adults. Analyses of MCS data have also influenced the Scottish government's policy on childhood overweight and obesity **(S6)**. In England, the National Obesity Observatory has made extensive use of MCS evidence. Its 2011 report, Obesity and Mental Health, says that MCS findings "act as a valuable reminder of how early relationships between obesity and well-being can emerge, and the need for public, family and individual level interventions for children". This organisation aims to offer a single point of contact for trusted information on evidence and research and works closely with policy-makers and practitioners involved in obesity and related issues.

Wider policy influence: The MCS has informed policy thinking on not only health but also child development, social mobility, poverty and many other topics. There are countless references to the study in central and local government policy documents. The governments of Wales, Scotland and Northern Ireland have also drawn heavily on MCS data. For example, an MCS analysis that the Northern Ireland Executive commissioned from CLS researchers has played a key role in the development of Stormont's child poverty strategy **(R5** & **S7)**. David Willetts, Minister of State for Universities and Science, has also referred on several occasions to the important role that the study plays in Westminster policy thinking. In 2010 he acknowledged that the MCS was "helping us assess what works when it comes to early-years interventions" **(S8)**. A year later he told an audience at the British Academy in London: "… when you read stories about how effective early intervention actually is or about the effects on a child of different patterns of parental work, they are likely to draw on analysis of the millennium birth cohort" **(S9)**.

International influence: The MCS has not only influenced health-related policies in other countries, it has also caused some nations to set up their own longitudinal surveys. The study has, for example, inspired similar projects in Ireland, New Zealand and France. The importance of the IOE researchers' role in this respect has been confirmed by not only James Williams (*see Quality*

Indicator comment) but by Professor Alan Hayes, Director of the Australian Institute of Family Studies. Professor Hayes said that the IOE's MCS team had "provided leadership with recent birth cohort studies in several countries, and have given particularly valuable support in the development of Growing Up In Australia: The Longitudinal Study of Australian Children" **(S10).**

Conceptual impact: The study has also helped to shape public debate on family issues and marriage as well as poverty, education, social mobility and, of course, health. Many pressure group and think tank reports **(e.g. S11)** cite the MCS or research based on its data, and even the Primate of All Ireland **(S12)** has referred to MCS findings.

Capacity building impact: The IOE's workshops on MCS offer training to research students, statisticians and data analysts from UK and overseas universities, and many other organisations. Between January 1, 2008 and July 31, 2013 these workshops attracted 200 participants. More than two thirds were researchers at UK universities. Most of the others work for national and local government, public bodies, the third sector and think tanks. The number of users downloading MCS datasets has been climbing year by year. In 2008, 145 researchers downloaded the study's datasets but in 2012 that total rose to 267.

5. Sources to corroborate the impact[3] (indicative maximum of 10 references)

S1: NICE (2008) Maternal and child nutrition. http://publications.nice.org.uk/maternal-and-child-nutrition-ph11/public-health-need-and-practice

S2: Dep. of Health (2009) Commissioning local breastfeeding support services. London. http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_106501

S3: NICE (2009) Reducing differences in the uptake of immunisations. http://publications.nice.org.uk/reducing-differences-in-the-uptake-of-immunisations-ph21/introduction

S4: Boyce, T., Peckham, S., Hann, A., Trenholm, S. *A Pro-active Approach: Health promotion and ill-health prevention*. London: The King's Fund, 2010. http://www.kingsfund.org.uk/sites/files/kf/field/field_document/health-promotion-ill-health-prevention-gp-inquiry-research-paper-mar11.pdf

S5: Welsh Assembly Government (2010) Draft all Wales obesity pathway. http://www.childreninwales.org.uk/policy/consultations/consultations/12840.html

S6: Connelly, R. (2011) Drivers of unhealthy weight in childhood: analysis of the Millennium Cohort Study, Scottish Government. http://www.scotland.gov.uk/Publications/2011/08/31113810/0

S7: REDACTED

S8: Statement to Select Committee on Science and Technology, July 22, 2010. http://www.publications.parliament.uk/pa/cm201011/cmselect/cmsctech/369/10072202.htm

S9: Speech by David Willetts, British Academy, March 1, 2011. https://www.gov.uk/government/speeches/the-arts-humanities-and-social-sciences-in-the-modern-university

S10: Professor Alan Hayes, Director of the Australian Institute of Family Studies (testimonial available from IOE).

S11: Lexmond, J. (2009) Children of Character, London: Demos. http://www.demos.co.uk/blog/children-of-character http://www.demos.co.uk/blog/children-of-character

S12: Address by Cardinal Seán Brady – reported in the *Irish Times*, November 4, 2008. http://www.catholicbishops.ie/2008/11/04/cardinal-sean-brady-addresses-ceifin-conference-family/

[3] All web links accessed 11/10/13