



Unequal at birth – Inequalities in the occurrence of low birthweight babies in Ireland

1. What is the study's background?

This study was funded by the Office of the Minister for Children and Youth Affairs (now the Department of Children and Youth Affairs) under the National Children's Research Programme. The study was undertaken by Helen McAvoy, Jennifer Sturley, Sara Burke and Kevin Balanda at the Institute of Public Health in Ireland.* The authors acknowledge the assistance and advice given by Sheelagh Bonham and her staff in the National Perinatal Reporting System (ESRI). The report was published in 2006.

2. What is the study's purpose?

This study assessed the relationship between socio-economic status of parents and the risk of a low birthweight (LBW) baby in Ireland. The study was linked to the target for reducing inequalities in LBW proposed by the Working Group on the National Anti-Poverty Strategy and Health. It also conducted a rapid review of evidence of effective approaches to reducing socio-economic inequalities in low birthweight.

The specific objectives were:

- » to describe socio-economic patterns in the occurrence of LBW babies in Ireland based on occupational status of parents;
- » to estimate the contribution of inequalities to the overall population burden of LBW;
- » to explore the evidence for what works in reducing inequalities in LBW;
- » to foster engagement with stakeholders on the issue through an interactive workshop based around the study's findings.

This briefing note summarises the method of research, key findings, conclusions and recommendations of the study. The full report is available on www.dcyia.ie and www.publichealth.ie

3. How was the study undertaken?

Data from the National Perinatal Reporting System were analysed on all singleton births in 1999 using SAS. Low birthweight was defined as *babies weighing less than 2.5kg at birth*.

A new variable was derived whereby 'occupational group' was primarily classified as the father's occupation, but where this was not recorded the occupation of the mother was used. Occupational groupings used in the study were based on the CSO system of socio-economic groupings. The odds of giving birth to a LBW baby among different socio-economic groups were compared using relative risks.

A rapid review of the evidence of effectiveness of interventions to reduce inequalities in the occurrence of LBW was conducted. This was explored in terms of:

- » income support and social policy interventions;
- » interventions targeting at-risk groups, such as teenage mothers and ethnic minority mothers;
- » psycho-social support interventions;
- » health behaviour interventions;
- » health service interventions.

4. What are the key findings?

4.1 Extent of inequalities in the occurrence of low birthweight in Ireland

- » Babies born to parents whose occupational status was classified as 'unemployed' or 'not stated' were at approximately twice the risk of being low birthweight (LBW) in Ireland in 1999, when compared to the higher professional occupational group.
- » Babies born to parents who were non-manual workers had an increased risk of between 46% to 60% of being LBW in 1999, when compared to the higher professional occupational group.
- » The greatest risk of LBW was recorded for babies born to parents who were classified in the 'unknown' occupation categories, which included those categorised as 'unemployed/home duties'.
- » If all socio-economic groupings had the same percentage of LBW births as the highest socio-economic group, there would be an estimated 695 fewer LBW babies born in 1999 in Ireland, equivalent to 29% of the total burden of LBW in Ireland in 1999.
- » Teenage mothers (aged 19 and younger) were significantly more likely to have a LBW baby. Unmarried mothers were also significantly more likely to have a LBW baby compared to married mothers.
- » Babies born to parents resident in Dublin City local authority were at almost twice the risk of LBW in 2001, when compared to those parents in Dun Laoghaire/Rathdown. The difference in risk of LBW comparing babies born in the local authorities with the highest and the lowest rates of LBW births is increasing over time. This indicates that there may be some widening of the geographic inequalities in LBW in the Eastern Regional Health Authority over this time.

4.2 Determinants of socio-economic inequalities in the occurrence of low birthweight

The mechanisms underlying the association between socio-economic disadvantage and increased risk of low birthweight (LBW) babies are complex and the causal pathways are not yet fully understood. Health behaviour, psycho-social, environmental, cultural and health service factors have been identified in these causal pathways. An effective framework to achieve better birth outcomes for lower socio-economic

groups must positively affect key factors along relevant causal pathways. In a temporal sense, this causal pathway encompasses factors that determine the mother's health prior to, and at, conception, as well as those that affect each trimester of pregnancy. There are two pathways to consider – the pre-term birth pathway and the growth limitation pathway, which may co-exist in the same pregnancy.

Key findings of the study included:

- » Lower income may directly affect a pregnant woman's ability to afford resources that may affect the well-being of her baby, such as a nutritious diet, transport to health services or home-heating. Little is known about the lived experience of low income pregnant women in this regard. The literature is inadequate to consider the effect of providing additional income during pregnancy on birth outcomes.
- » Babies born to teenage mothers are at greater risk of LBW. Girls in lower socio-economic groups are more likely to experience a teenage pregnancy. Review-level evidence suggests that teenage pregnancy can be reduced through a range of interventions. Furthermore, there is evidence to show that the risk of LBW for babies born to pregnant teenagers can be reduced through a combination of home visiting and clinical support services.
- » There is a lack of evidence on the effectiveness of interventions reducing LBW among at-risk ethnic minority groups. Birth outcomes among Traveller women in the Irish context are of concern and need further study.
- » Women from lower socio-economic groups may be exposed to additional psychological stresses in pregnancy, arising from a lack of economic resources. No conclusion can be drawn from the international literature in respect of the effectiveness of stress-reduction interventions.
- » Lower socio-economic status women tend to report less social support during pregnancy. A Cochrane review concluded that there was no evidence of effect for additional social support during pregnancy in preventing LBW. These results are applicable to all pregnant women and may not necessarily apply to the situation of lower socio-economic women.
- » The prevalence of chemical drug misuse in the antenatal population of one maternity hospital in Ireland was estimated a 2.8%, with drug misuse

associated with younger age and lower socio-economic status. There is some evidence to support the effectiveness of specialist drug misuse services in improving birth outcomes, including LBW, in this small subgroup of pregnant women.

- » Disadvantaged women are more likely to smoke in pregnancy and to smoke more cigarettes than more advantaged mothers, and this is strongly associated with an increased risk of LBW. Review-level evidence demonstrates that smoking cessation programmes in pregnancy can reduce the risk of LBW, but lower socio-economic status women may find it harder to quit.
- » No conclusion can be drawn on the effectiveness of nutritional advice in pregnancy on the prevention of LBW.
- » Evidence suggests that lower socio-economic status women may be *less likely* to consume alcohol in pregnancy than higher socio-economic status women. No assumptions are made regarding the role of alcohol in the relationship between lower socio-economic status and LBW.
- » Late presentation to antenatal care is associated with an increased risk of LBW in Ireland. Late attenders and non-attenders (unbooked pregnancies, i.e. first attendance is in labour) are a high-risk group for poor birth outcomes. There is conflicting evidence from randomised controlled trials on the effectiveness of the timing and intensity of antenatal care on decreasing the risk of LBW.
- » Lower socio-economic status women are more likely to experience infections associated with LBW babies. Evidence of effectiveness in terms of screening remains unclear.
- » LBW has a significant interface with congenital anomaly, but the issue remains poorly delineated and understood.

5. What are the conclusions?

The study reached the following overall conclusions:

1. In keeping with the international experience, **babies born in Ireland to parents of lower socio-economic status were significantly more likely to be low birthweight.**
 - » Babies born to unemployed parents were almost twice as likely to be LBW compared to babies born to parents recorded as higher professionals.
2. There are considerable challenges in analysis of socio-economic patterns in birth outcomes because of **limited information on the occupational status of one or both parents in the National Perinatal Reporting System.**
3. Tackling socio-economic inequalities in the occurrence of low birthweight **could substantially reduce the overall population health burden of LBW babies in Ireland.** Low birthweight is significantly associated with diminished health and academic and social outcomes in later childhood and adulthood.
4. **Unmarried and teenage mothers** in Ireland were significantly more likely to have a LBW baby.
5. The determinants of socio-economic inequalities in low birthweight are broad, encompassing social, health behaviour, environmental, health service, psychological and cultural factors. The interactions between these factors mean that it is **difficult to assess the effects of single factors and groups of factors in causal pathways linking disadvantage and LBW births.**
6. **Social policy relevant to income support for pregnant women** may have a role in influencing the health and well-being, and subsequent birth outcomes for disadvantaged women. But there is a lack of research on the issue in Ireland and internationally.
7. No conclusion can be drawn in terms of the **role of alcohol or nutrition in the causal pathway** linking lower socio-economic status to LBW. Review-level evidence suggests that neither social support nor nutritional advice interventions are effective in improving birthweight outcomes.
8. There is evidence of **significant associations between late attendance and non-attendance at antenatal care and worse birth outcomes, including low birthweight.** The evidence on the effectiveness of antenatal care is unclear, in part due to confounding factors in respect of attenders and poor/non-attenders.

9. There is reasonable **evidence of effectiveness in reducing the risk of LBW babies** for the following groups – (i) comprehensive home visiting and clinical care for teenage mothers; (ii) specialist services for pregnant drug-misusers; and (iii) pregnant smokers through effective smoking cessation programmes.
10. Further research is needed to understand **patterns in terms of social inequalities in pre-term and full-term LBW babies**, and in respect of the relationship between socio-economic status, congenital anomaly and low birthweight.

6. What are the recommendations?

A number of recommendations arise from the research, as follows:

1. Recommendations for data collection and research

- » Further analyses on the extent and nature of socio-economic inequalities in birth outcomes, including low birthweight, are warranted to explore significant gaps in our knowledge.
- » Further work on how to effectively identify disadvantaged women in the National Perinatal Reporting System dataset, using occupational status and other variables, is required in order that inequalities in birth outcomes can be comprehensively measured.
- » The long-term outcomes associated with inequalities in low birthweight on the island of Ireland should be explored using the longitudinal survey data from the study *Growing Up in Ireland* and the Northern Ireland *Millennium Cohort Study*.
- » Research is needed to better understand the causal pathways between social disadvantage and poor birth outcomes, and identify protective and risk factors.
- » Qualitative research into the lived experience of disadvantaged women in terms of their health behaviours in pregnancy would be informative.
- » Analyses should further explore the pre-term and intra-uterine growth retardation pathways and underlying factors.

2. Recommendations for health and social policy

- » An approach encompassing the social determinants of health to low birthweight is required, examining environmental, health behaviour, social, health service, psychological and cultural factors.
- » Ongoing support is needed for the implementation of effective approaches to preventing unplanned teenage pregnancy, as well as effective holistic support programmes for pregnant teenagers.
- » Low birthweight should be understood as a significant factor in the generation and maintenance of health inequalities at population level and prioritised within population health strategies and programmes.
- » Effective tobacco-control policy and programmes that reduce smoking and social inequalities in smoking among women and girls could support the development of more equitable birth outcomes.

3. Recommendations for health and social services serving the needs of pregnant women

- » Early enrolment in antenatal care by disadvantaged women should be promoted and antenatal services should consider appropriate responses to potentially vulnerable non-attenders where possible.
- » Antenatal services should be recognised and resourced as an important health promotion setting with particular attention paid to supporting healthy behaviours among disadvantaged women.
- » The effectiveness of antenatal care and allied health promotion and social support services should be evaluated from the perspective of all women, but also from the perspective of reducing inequalities in birth outcomes.
- » Multidisciplinary specialist services for defined population groups that have demonstrated effectiveness in reducing the risk of low birthweight should be resourced and enhanced, including those specialist services related to:
 - » pregnant teenagers;
 - » drug-misusing women;
 - » smoking cessation.

7. What are the benefits of the study?

This study provides useful information on low birthweight (LBW) – an outcome strongly associated with poor health and development for children, and a significant and expensive population health burden. The data in this report are relevant to policy, in particular the national child health indicator on LBW and the target on reduction of inequalities in LBW set out by the Working Group on the National Anti-Poverty Strategy and Health. Social patterning in the occurrence of LBW and in early enrolment in antenatal care were subsequently reported in the biennial publication series *State of the Nation's Children* by the Department of Children and Youth Affairs.

The study's findings will be of benefit to organisations seeking to improve the birth outcomes of lower income or disadvantaged women, including health services, community welfare and family support services. The report highlights the issue of inequalities as important potential indicators of a quality antenatal service and maternity strategies on the island. The study reinforces the importance of improving the health of girls and women as a population health priority in terms of improving the health of future generations. The report allows some prioritisation for action in areas where there is review-level evidence of effect, notably in the context of supports for teenage mothers, services for drug-misusing women and support for smoking cessation in pregnancy.

The report highlights a number of knowledge gaps and signposts areas for further focused research attention from a quantitative and qualitative perspective.

The implications of low birthweight for the health and development of children in Ireland can now be understood through the availability of longitudinal data recorded in the study *Growing Up in Ireland*, providing a longer term view of the impact of the LBW outcome studied in this analysis. Subsequent analyses of longitudinal studies, published during 2011, on children in Northern Ireland found that low birthweight was predictive of worse educational, cognitive, behavioural and general health outcomes; similarly, birth weight was predictive of poor health outcomes and test scores at age 9 in analysis on *Growing Up in Ireland* data (both references in full report). The Institute of Public Health website features a dedicated page on the issue of inequalities in low birthweight and provides links to research (see www.publichealth.ie/healthinequalities/healthinequalitiesandlowbirthweight).



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