# Socioeconomic Disparities in Low Birthweight: A Comparison Across Anglophone Countries

Melissa L. Martinson
University of Washington

Nancy E. Reichman
Robert Wood Johnson Medical School

## Background

Socioeconomic inequalities in health are pervasive in the developed world. Yet, despite a developing literature comparing health indicators across OECD countries, much remains to be learned about inequalities in health across countries. A number of studies have compared the income gradients in self-reported measures of child health in the United States (US) to the United Kingdom (UK), Australia, or Canada, but have produced inconclusive results about whether income inequalities in child health in the other countries are on par with those in the United States (Case et al 2002; Currie et al 2007; Propper et al 2007; Case et al 2008; Khanam et al 2009). Recent research suggests that income gradients in available measures of health, including biomarkers, across the life course are very similar in the United States and United Kingdom, despite better overall population health in the latter country (Martinson 2012). The cross-national studies of income disparities in child health discussed above looked at a patchwork of conditions and ages, which may have contributed to the mixed findings. An important step in understanding health disparities across contexts is to quantify health at the "starting gate" (birth) in an international comparative context—something that as far as we know has not been done.

Low birthweight (< 2500 g) is an important marker for subsequent child morbidity (Reichman 2005). In the United States, there is clear evidence of a socioeconomic gradient in low birthweight, although the gradient varies by race/ethnicity (Nepomnyaschy 2009). This paper uses data from four highly comparable, nationally representative studies to compare income gradients in low birthweight in Australia, the United Kingdom, Canada, and the United States. Anglophone countries share many cultural similarities but differ in terms of their social safety nets, including health care provision.

Propositions based on two contrasting theoretical frameworks will be considered: (1) If neo-materialist theoretical explanations (e.g. disadvantaged life conditions) underlie income gradients should be larger in the United States than in its peer countries due to higher US poverty rates and weaker social and health safety net (Lynch et al. 2000). (2) If relative social deprivation/social position leads to health inequality, then similar gradients across countries are expected, as societal inequality is pervasive in all four nations (Marmot & Wilkinson 2001).

## Method

This paper will use four national datasets: The Longitudinal Study of Australian Children – Birth Cohort (LSAC), the Millennium Cohort Study for the UK (MCS), the Early Childhood Longitudinal Study – Birth Cohort for the US (ECSL-B), and the National Longitudinal Survey

of Children and Youth (NLSCY) for Canada. Preliminary analyses are conducted on the LSAC, MCS, and ECLS-B. The outcome of interest is low birthweight (<2500 grams), but we will also consider birthweight as a continuous measure. The independent variables of interest are weighted income quartiles calculated from total family income. These income quartiles use the OECD equivalency scale to adjust for family size. A rich set of covariates are included in the models and are comparable across datasets. These controls include: maternal age at birth, marital status at birth, child sex, parity, nativity status, maternal race/ethnicity/region of origin, and maternal smoking.

For the preliminary results, we estimated logistic regression models and present odds ratios of low birthweight regressed on income quartile. The svy procedures in Stata SE 12 were used to adjust for complex sampling design in each of the datasets.

**Preliminary Results**

We present preliminary results for the United Kingdom, Australia, and the United States. The unadjusted odds ratios in Figure 1 demonstrate clear income gradients in low birthweight among infants in all three countries, where lower income is associated with higher rates of low birthweight births. The logistic regression models suggest that low and middle income women are significantly more likely to have a low birthweight infant than high income women in all three countries. However, in the fully adjusted logistic regression model (Figure 2), the graded relationship between income and low birthweight becomes attenuated. We find that the association between low income and low birthweight status is strongest in the US (OR=1.7) and Australia (OR=1.8), and lowest in the UK (OR=1.4). Associations in all three countries are statistically significant at $p<.05$.

**Conclusion**

Income inequality in low birthweight is as pervasive in Australia and the United Kingdom as it is in the United States (we have yet to explore the Canadian data). Despite very different social welfare and health care systems in Australia and the United Kingdom, infants in these countries have similar health inequalities by income as those in the United States. This finding provides some support for proposition that societal inequality and relative social position underlie health disparities, at least at the starting gate.

## References


Case, A., Lee, D., & Paxson, C. (2008). The income gradient in children's health: A comment on Currie, Shields and Wheatley Price. *Journal of Health Economics, 27*(3), 801-807.

Case, A., Lubotsky, D., & Paxson, C. (2002). Economic status and health in childhood: The origins of the gradient. *American Economic Review, 92*(5), 1308-1334.

Currie, A., Shields, M. A., & Price, S. W. (2007). The child health/family income gradient: Evidence from England. *Journal of Health Economics, 26*(2), 213-232.

Khanam, R., Nghiem, H. S., & Connelly, L. B. (2009). Child health and the income gradient: Evidence from Australia. *Journal of Health Economics, 28*(4), 805-817.

Lynch, J. W., Smith, G. D., Kaplan, G. A., & House, J. S. (2000). Income inequality and mortality: Importance to health of individual income, psychosocial environment, or material conditions. BMJ: British Medical Journal, 320(7243), 1200.

Marmot, M., & Wilkinson, R. G. (2001). Psychosocial and material pathways in the relation between income and health: A response to lynch et al. BMJ: British Medical Journal, 322(7296), 1233.

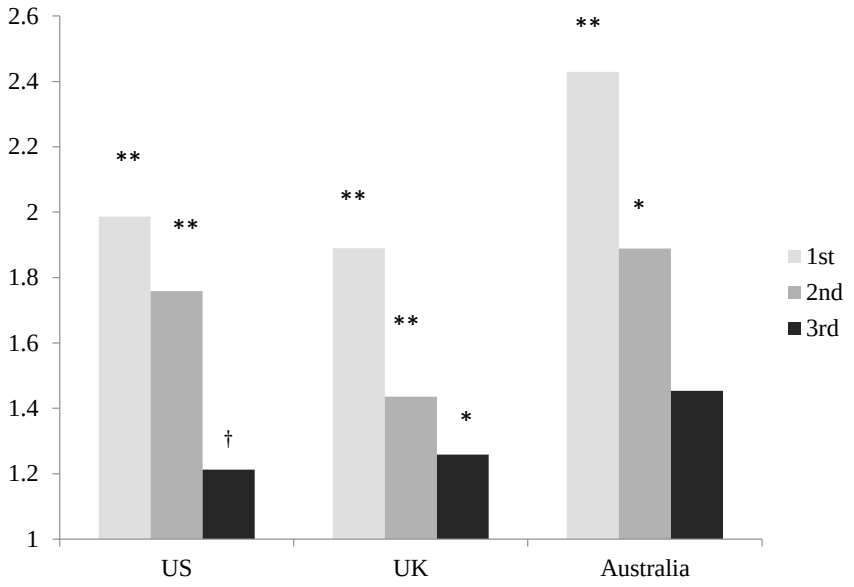
Martinson, M. L. (2012). Income inequality in health at all ages: A comparison of the United States and England. *American Journal of Public Health, 102*(11), 2049-2056.

Nepomnyaschy, L. (2009). Socioeconomic gradients in infant health across race and ethnicity. *Maternal and Child Health Journal, 13*(6), 720-731.

Propper, C., Rigg, J., & Burgess, S. (2007). Child health: Evidence on the roles of family income and maternal mental health from a UK birth cohort. *Health Economics, 16*(11), 1245-1269.

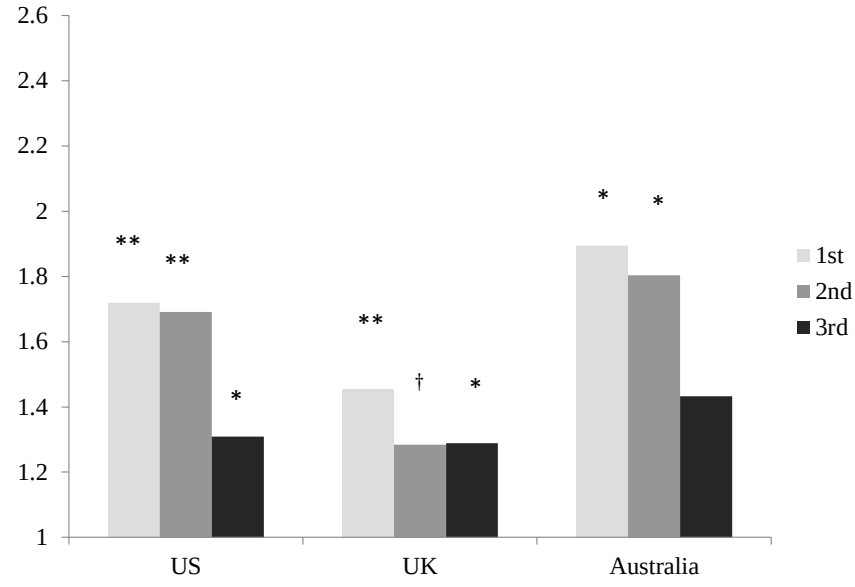
Reichman, N. E. (2005). Low birth weight and school readiness. *The Future of Children, 15*(1, School Readiness: Closing Racial and Ethnic Gaps), pp. 91-116.

**Figure 1: Low Birthweight Weighted Odds Ratios - Unadjusted (**Top Income Quartile Reference Group)




** p<.01, * p<.05, † p<.10

**Figure 2: Low Birthweight Weighted Odds Ratios – Adjusted[1] (**Top Income Quartile Reference Group)




** p<.01, * p<.05, † p<.10

[1]Model includes: Parity, Gender, Race/Ethnicity/Nativity, Marital Status, Maternal Age at Birth, Smoking