

Socioeconomic Disparities in Health at the Starting Gate: Australia, Canada, the United Kingdom, and the United States Compared

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Background

Socioeconomic inequalities in health are pervasive in the developed world, a fact that has led to questions about the extent and nature of health inequalities across countries. Yet, despite a developing literature on health across OECD countries, relatively little is known about inequalities in health across countries and when during the lifecourse these inequalities emerge. A number of studies have compared income gradients in parent-reported child health in the United States (US) to those in the United Kingdom (UK), Australia, and Canada, but this body of work has not produced a consistent picture of child health across countries (Case et al 2002; Currie et al 2007; Propper et al 2007; Case et al 2008; Khanam et al 2009). Recent studies, using a number of different health measures, including some based on biomarkers, found that socioeconomic gradients in health are very similar in the US and UK throughout the lifecourse, despite better overall population health in the latter country; however, the available measures of health for young children were limited in these studies (Banks et al 2006; Martinson 2012). An important and necessary step for documenting and understanding health inequalities across countries and when during the lifecourse those inequalities emerge is to quantify health inequalities across countries at very young ages. We address this important knowledge gap by considering socioeconomic inequalities in health at the “starting gate” (birth) in an international comparative context, which as far as we know has not yet been done.

Low birthweight (< 2500 g) is an important measure of infant health because it is not only a strong risk factor for infant mortality, but it is also a marker for subsequent child morbidity and developmental impairments among those who survive (Reichman 2005) and an important predictor of health and socioeconomic status over the lifecourse and even across generations (Johnson & Schoeni, 2011). In the US, there is clear evidence of a socioeconomic gradient in low birthweight, although the gradient varies by race/ethnicity (Nepomnyaschy 2009). Little is known about the magnitude of socioeconomic inequities in health at the starting gate in other developed countries.

This paper uses nationally representative data from four countries—Australia, Canada, the UK, and the US—to compare socioeconomic gradients in low birthweight across English-speaking countries that share many cultural features but differ in terms of public support systems, including the provision of health care. Australia, Canada, and the UK enjoy better overall population health than the US and also have more generous social support systems and lower overall economic inequality as measured by Gini coefficients (OECD, 2012). We focus on the extent to which socioeconomic gradients in health at birth in Australia, Canada, and the UK differ from those in the US.

Although our study is primarily descriptive, establishing previously unknown but important facts about health inequalities across countries, we also explore whether the cross-national patterns of socioeconomic inequalities in infant health are consistent with dominant theoretical frameworks of health disparities. In particular, if differences in resources including living conditions underlie health inequalities, we would expect socioeconomic gradients to be larger in the US than in the other countries due to higher poverty rates in concert with weaker social and health support systems in the US (Lynch et al. 2000). On the other hand, if relative social deprivation or social position is more important than levels of resources, we would expect to see similar socioeconomic gradients in health across countries, as income inequality is pervasive in all four nations (Marmot & Wilkinson 2001).

Method

We use four nationally representative datasets: The Longitudinal Study of Australian Children – Birth Cohort (LSAC) for Australia, the Millennium Cohort Study (MCS) for the UK, the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) for the US, and the National Longitudinal Survey of Children and Youth (NLSCY) for Canada. The health marker of interest is low birthweight (<2500 grams). The key measure of socioeconomic status is weighted income quintile calculated from total family income and, based on the OECD equivalency scale, adjusted for family size. We also consider maternal education, another important dimension of socioeconomic status, coded into the following categories based on previous comparative research (Pilkauskas & Martinson 2014; Choi et al. 2011): less than high school diploma or equivalent, high school diploma or equivalent, some postsecondary education or college, and college degree or higher. We adjust for important compositional differences of countries that are comparable across datasets—namely, maternal age at birth, marital status at birth, child sex, parity, nativity status, maternal race/ethnicity/region of origin, and maternal smoking.

For each of the four countries, we estimate logistic regression models to obtain odds ratios of low birthweight as a function of income quintile or education level. We then compute low birthweight proportions for each income or education group adjusted for compositional differences, allowing for better comparability across countries. The svy procedures in Stata SE 13 are used to adjust for complex sampling design in each of the datasets in order to produce nationally representative results.

Preliminary Results

We present preliminary results for all four countries. The estimates for Canada are the most preliminary because they are based on a non-random subset of the NLSCY that is being used to test the programming code that we provided to Statistics Canada to run the analyses for us (nationally representative results will be available in October 2014). The estimates for Australia, the UK, and the US are nationally representative.

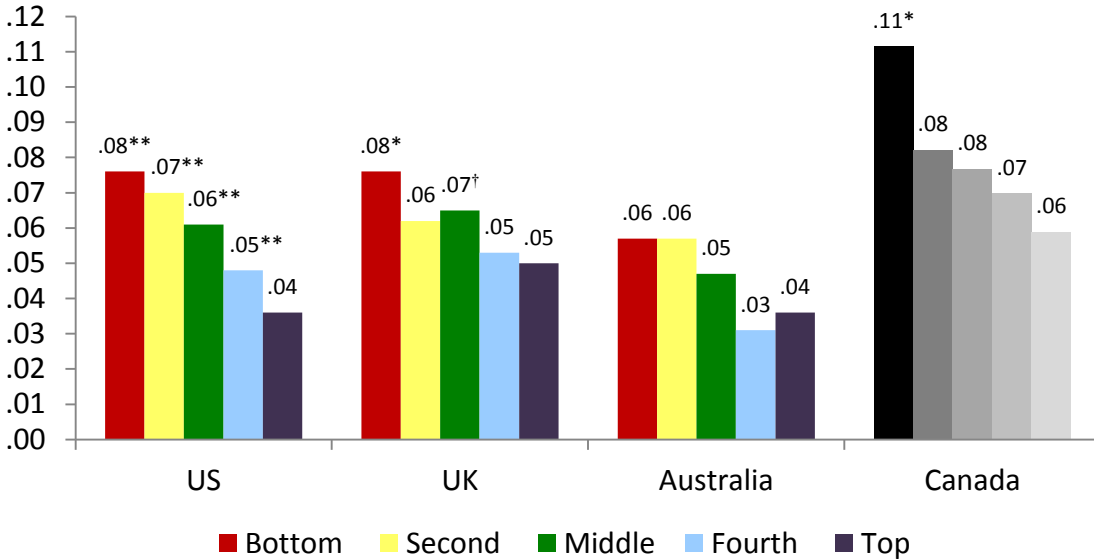
The adjusted proportions demonstrate a general pattern of income inequality in low birthweight in all four countries, wherein lower incomes are associated with higher rates of low birthweight (Figure 1). However, the magnitude of the income gradient varies by country. In the

US, we see the clear income gradient that has been demonstrated in previous research. The (preliminary) pattern in Canada is similar to that in the US, but the only significant difference is between the lowest income quintile and the highest quintile. Income gradients in low birthweight are also present in Australia and the UK, but are much flatter than that in the US. Adjusted proportions of low birthweight by education category (Figure 2) reveal patterns that are similar to those by income, with the exception of some college in Australia.

Conclusion

Socioeconomic gradients in low birthweight are present in Australia, Canada, the UK, and the US, although the gradients are steepest in the US (and possibly Canada). These preliminary findings provide some support for both prominent theories of health inequalities. Low income and low education are associated with a higher risk of low birthweight, even in countries with universal, equitable healthcare provision, though it appears that the countries with a commitment to universal healthcare are able to buffer some of the most deleterious effects of socioeconomic inequality. These preliminary results suggest that gradients in health at the “starting gate” are most pronounced in the US, but are also present to varying degrees in the other countries. For the US and UK, the results at birth mirror previous findings examining health gradients throughout the lifecourse (Martinson 2012). It is noteworthy that the US has overall low birthweight rates on par with the other countries examined here, yet has much higher overall rates of morbidity later in life (Martinson et al 2011; Banks et al 2006). Perhaps the more generous and equitable social and policy environment in the UK, Australia, and Canada reduce adult morbidity for all, while leaving the health gradient relatively intact. Future comparative research is needed to disentangle the role of lower income inequality, generous social safety nets, and universal healthcare in the development of health inequities throughout the lifecourse.

Figure 1: Adjusted proportions of low birthweight by income quintile in the US, UK, Australia and Canada^{1,2}

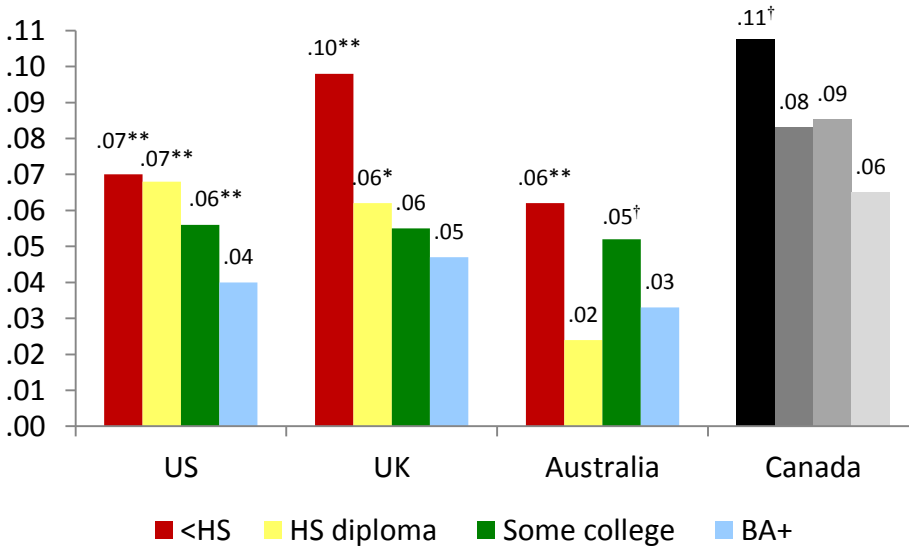


Models control for: parity, gender, race/ethnicity/nativity, marital status, maternal age at birth, and smoking

¹ Canadian results based on subset of NLSCY. Final results available by 10/30/14.

² Statistically different from the highest income quintile at ** p<.01, * p<.05, † p<.10.

Figure 2: Adjusted proportions of low birthweight by maternal education in the US, UK, Australia and Canada^{1,2}



Models control for: parity, gender, race/ethnicity/nativity, marital status, maternal age at birth, and smoking

¹ Canadian results based on subset of NLSCY. Final results available by 10/30/14.

² Statistically different from the BA degree or higher education category at ** p<.01, * p<.05, † p<.10.

References

- Banks, J., Marmot, M., Oldfield, Z., & Smith, J. P. (2006). Disease and disadvantage in the United States and in England. *JAMA: The Journal of the American Medical Association*, 295(17), 2037-2045.
- 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.
- Choi, Kate H., Marta Tienda, Deborah Cobb-Clark and Mathias Sinning. 2011. "Immigration and Status Exchange in Australia and the United States." *Research in Social Stratification and Mobility*.
- 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.
- Johnson, R.C., & Schoeni, R.F (2011). The influence of early-life events on human capital, health status, and labor market outcomes over the life course. *B E J Econom Analysis & Policy*, 11(3), 2521.
- 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., Teitler, J. O., & Reichman, N. E. (2011). Health across the life span in the United States and England. *American Journal of Epidemiology*, 173(8), 858-865.
- 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.
- Pilkaukas, N., & Martinson, M. (2014). Three-generation family households in early childhood: Comparisons between the United States, the United Kingdom, and Australia. *Demographic Research*, 30(60), 1639-1652.

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.