# Does neighborhood socioeconomic status predict the risk of preterm birth? A community-based Canadian cohort study

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## Abstract

**Background:** Globally, 11.1% of births are preterm. Preterm birth (PTB), that is, delivery prior to 37 weeks of gestation, is a major contributing factor to neonatal deaths, and among the survivors, PTB is also a significant risk factor for short-term and long-term morbidity. The incidence of PTB and its associated mortality and morbidity could potentially be reduced if women at risk of delivering preterm were identified early in gestation and appropriately managed. The aetiology of PTB is multi-factorial, and one risk factor for PTB may be neighbourhood socioeconomic status (SES): the rate of PTB in low SES neighbourhoods is higher than the rate in high SES neighbourhoods.

**Methods:** This prospective cohort study was part of the Alberta Pregnancy Outcomes and Nutrition study (APrON). From an initial sample of 600 pregnant women recruited from Edmonton and Calgary, 402 mothers provided complete details at 3 months postpartum; 300 stayed on to provide information at 6 months postpartum. During pregnancy and at 3 and 6 months postpartum, data on maternal and infant socio-demographic, behavior, and feeding were collected.

**Results:** The rates of PTB in the least and most deprived neighbourhoods were 7.54% and 10.64%, respectively. Neighbourhood variation in PTB was 0.20, with an intra-class correlation of 5.72%. Neighbourhood SES, combined with individual-level predictors, predicted PTB with an area under the receiver-operating characteristic curve (AUC) of 0.75. The sensitivity was 91.80% at a low-risk threshold, with a high false-positive rate (71.50%), and the sensitivity was 5.70% at a highest risk threshold, with a low false-positive rate (0.90%). An agreement between the predicted and observed PTB demonstrated modest model calibration. Individual-level predictors alone predicted PTB with an AUC of 0.60. Conclusion Although neighbourhood SES combined with individual-level predictors improved the overall prediction of PTB compared with individual-level predictors alone, the detection rate was insufficient for application in clinical or public health practice. A prediction model with better predictive ability is required to effectively find women at high risk of preterm delivery.

**Conclusions:** Although neighbourhood SES combined with individual-level predictors improved the overall prediction of PTB compared with individual-level predictors alone, the detection rate was insufficient for application in clinical or public health practice. A prediction model with better predictive ability is required to effectively find women at high risk of preterm delivery.