

## Impact of clinical subtypes of preterm birth on child health and development

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### Introduction

Preterm birth (birth <37 weeks of gestation) is common. While the clinical conditions leading to preterm birth are heterogeneous, most studies examining the short- and long-term consequences of preterm birth on child health and development, only consider the gestational age at delivery, and not the underlying mechanism of preterm birth.

### Objectives and Approach

Maternal hospitalization and perinatal data for deliveries occurring in Alberta, Canada in 2004, 2009, and 2014 were linked to identify underlying mechanisms for delivery (i.e., infection/inflammation (I/I), placental dysfunction (PD), both, or neither). Linked hospitalization, emergency department, and physician claims data were used to assess child health outcomes up to age 10. Chi-square tests were used to assess differences in the absolute rate of each outcome stratified by gestational age at delivery and underlying mechanism for delivery. Logistic regression was used to assess relative differences following adjustment for confounders compared to term infants without exposure to I/I or PD.

### Results

A total of 134,424 children were included in the analysis. For preterm births occurring <32 weeks of gestation, no differences were observed in child health outcomes based on the underlying mechanism of preterm birth. However, infants born at 32-33 weeks following PD compared to I/I had significantly higher odds (PD:69.1%, OR=29.7, 95% CI:25.7-34.2 vs. I/I:47.2%, OR=18.7, 95% CI:16.8-20.9) of neonatal morbidity; while those born at 34-36 weeks had increased odds of neonatal morbidity (PD:21.1%, OR=5.1, 95% CI: 4.7-5.5 vs. I/I:16.2%, OR=3.7, 95% CI:3.4-3.9) and developmental disabilities (PD:3.3%, OR=2.2, 95% CI:1.8-2.6 vs. I/I:1.6%, OR=1.7, 95% CI:1.4-2.0). No differences were observed in mortality by sub-type of preterm birth; however, as expected perinatal mortality rates were significantly more common in preterm than term births.

### Conclusion/Implications

Both the short- and long-term outcomes of preterm birth differ by the underlying mechanism leading to preterm delivery. Having a clearer prognosis for infants born preterm may promote the use of clinical interventions earlier for children at increased risk, leading to improved child health and development.

