PRENATAL CARE AND ITS IMPACT ON HEALTHY BIRTHS

Ariane Erickson, Daniella Furman, Yerin Lim, Kelsey Maass, Vi Nguyen, Jialing Wang, Sophia Yang

CONCLUSIONS

Prenatal care reduces rates of infant death, admission to the NICU, and very low birth weight. Starting prenatal care early in the pregnancy is important for reducing death rates, especially when infants are born early. Differences in use of prenatal care by insurance status, race, and education suggest that expanded access to prenatal care, especially for vulnerable groups, could help lower rates of infant morbidity and mortality.

PROBLEM

The US has higher rates of infant morbidity and mortality than other countries with a similar gross domestic product (GDP). Further, within the US, neonatal and infant morbidity and mortality rates vary by socioeconomic status, geographic location, and maternal race. We examine the role of ***prenatal care*** in US birth outcomes, as well as the demographic and socioeconomic variables that predict its use.

DATA

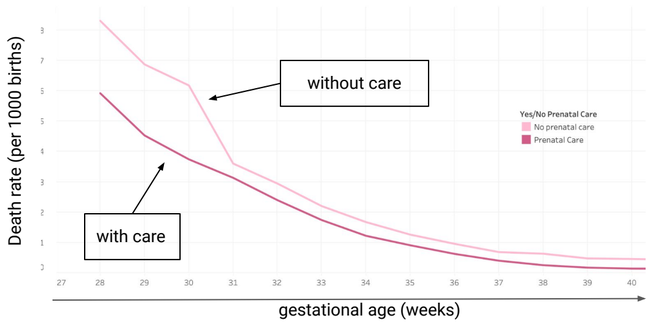
Sourced from Centers for Disease Control & Prevention

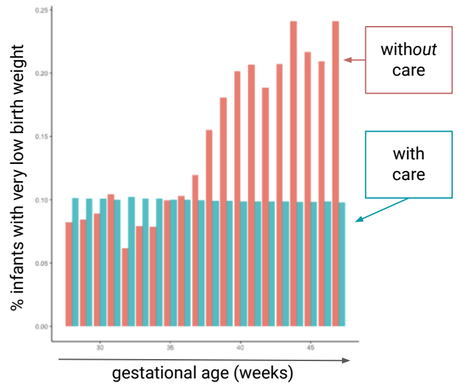
US Natality Records, 2016-2018: Detailed account of live births by year within the US, including parental demographic characteristics such as race, age, and educational attainment, as well as maternal health features, use of prenatal care, birth characteristics, neonatal morbidity, and method of payment for birth services.

US Linked Birth/Infant Death Records, 2016-2018: Detailed account of deaths of children < 1 year of age within the US. Information includes cause of death, maternal and infant demographics, and maternal use of prenatal care.

EXPLORATORY DATA ANALYSIS

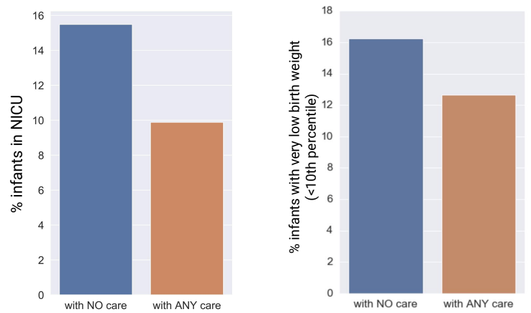
- Across gestational age, infant **death rate is lower** with prenatal care





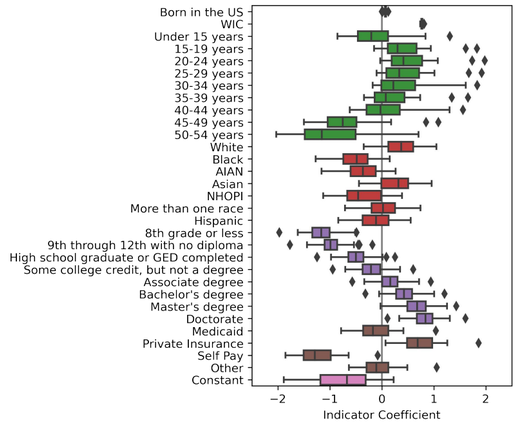
- Full-term **infant morbidity is lower** with prenatal care

FORMAL ANALYSIS

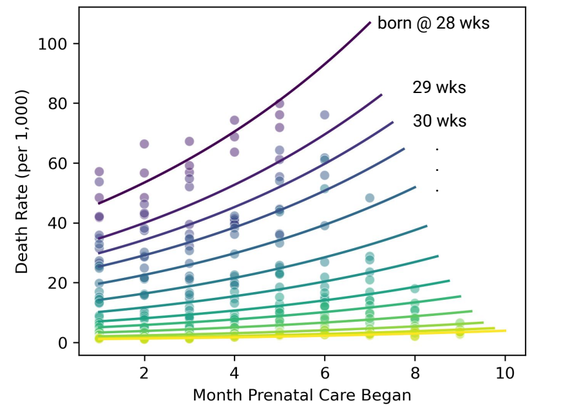


Case-matching (on maternal demographics, health, insurance coverage, delivery type, and gestational age at birth) revealed that having access to prenatal care:

- reduced rate of neonatal ICU (NICU) admissions by 36%
- reduced incidence of very low birth weight by 22%

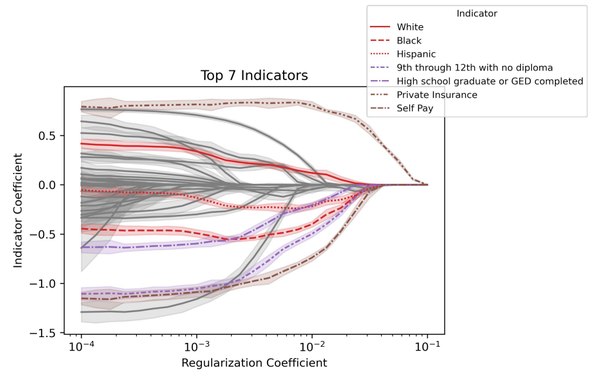


Logistic regression using 25 random data subsets (to balance incidence of care vs. no care) identified favorable and unfavorable predictors of prenatal care use



Mixed-effects modeling revealed that:

- Earlier prenatal care reduces infant death rate
- Greatest effect of early care in infants born at earlier gestational age



L1-regularization enabled the identification of the top 7 predictors of prenatal care use, which include **having private insurance** vs. **paying out of pocket**, maternal **race**, and maternal **educational attainment**