Attend, Learn, and Vaccinate? Antenatal Care Adherence Works but Not for Everyone

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Abstract

This paper examines the causal effect of antenatal care (ANC) adherence on child immunization in Senegal, where nearly one-quarter of children remain incompletely vaccinated despite stable coverage over the past two decades. Using seven waves of Demographic and Health Surveys (2012–2019) matched with regional health-facility data, we implement a copula-based control-function estimator that exploits the WHO-recommended third-month initiation of ANC as a quasi-natural experiment. We find no direct causal effect of ANC adherence on full immunization once individual and regional heterogeneity is accounted for. However, vaccine-specific estimates reveal strong aggregation bias: ANC increases uptake of vaccines administered later in infancy and requiring sustained maternal engagement, such as diphtheria–pertussis–tetanus (DTP3) and measles, by 8.2 and 6.3 percentage points, respectively, but has no effect on birth-dose or campaign-delivered vaccines, such as Bacillus Calmette–Guérin (BCG) and polio. Heterogeneity analysis shows that ANC yields returns only among less-educated mothers, by filling health-knowledge gaps and increasing their children's likelihood of completing DTP3 and measles vaccinations. We also find evidence of a son-preference mechanism in urban areas for DTP3 and robust support for a fertility-intention channel affecting both DTP3 and measles. Our findings highlight prenatal engagement as an early-life behavioral human-capital investment with selective returns and the potential to promote more equitable immunization coverage in the developing world.

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Keywords: antenatal care, child immunization, education, heterogeneous, causal inference.

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