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Publishing Title: **Impact of Maternal Immunization against Influenza on Prematurity and Birth Weight**

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Abstract Body: **Background:** Evidence from animal models suggests an adverse impact of influenza infections on fetal development. However, little is known about the benefits of maternal influenza immunization on birth outcomes. We analyzed data from Georgia Pregnancy Risk Assessment Monitoring System (PRAMS) to evaluate the association between maternal influenza immunization and prematurity and birth weight-related outcomes.

Methods: The study included data from June 2004 through September 2006. We used logistic regression to evaluate the association of maternal influenza vaccine and a) prematurity b) small for gestational age (<10th percentile weight for gestational age). We adjusted for maternal age (< 20, 20-34 and >34 y), black race, insurance status, and pre-pregnancy maternal weight. Outcomes were analyzed by periods of varying levels of influenza activity.

Results: There were 6,410 births during the study period and 15% women had received the influenza vaccine during pregnancy.

Table: Adjusted odds ratios of prematurity and small for gestational age by maternal influenza vaccine status (Odds Ratios <1 imply a protective effect of the vaccine)				
Analysis Period	Premature		Small for Gestational Age	
	Odds Ratio (95% CI)	p value	Odds Ratio (95% CI)	p value
All seasons/periods	0.8 (0.6-1.1)	0.18	0.9 (0.6-1.3)	0.66
Putative influenza season (Oct-May)	0.6 (0.4-0.9)	0.01	0.8 (0.5-1.3)	0.42

Period of at least local influenza activity*	0.5 (0.3-0.9)	0.02	0.7 (0.4-1.3)	0.24
Period of widespread influenza activity*	0.3 (0.1-0.7)	0.01	0.4 (0.2-1)	0.04

*definitions per standardized state and territorial epidemiologists reports
 In the analysis with the widespread influenza activity as the exposure variable (restricted to the newborns of vaccinated mothers), there were significantly reduced odds of prematurity (OR= 0.36; 95% CI 0.14 -0.91) and small for gestational age (OR= 0.30; 95%CI 0.12-0.78).

Conclusions: We found an association between maternal influenza immunization and reduced rates of prematurity during any influenza activity period. During the period of widespread influenza activity in rates (odds) of small for gestational age infants were decreased. Influenza immunization rates are extremely low in pregnant women in the United States. There is a need for expanding efforts for improving maternal influenza immunization rates.

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