Identifying infants at increased risk for late initiation of immunizations: maternal and provider characteristics

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OBJECTIVE: We identified maternal, provider, and community predictors among infants for late initiation of immunizations.

METHODS: We performed a retrospective cohort study of infants born between January 1, 2002, and December 31, 2004, in Philadelphia, Pennsylvania. Primary outcomes were age in days at first office-based immunization and status as a late starter (i.e., initiating office-based immunizations after 90 days of age). Candidate predictors included sociodemographic and prenatal characteristics, immunization provider practice type and size, and neighborhood factors. We performed hierarchical logistic regression and Cox regression models to identify independent predictors for being a late starter and prolonged time to first immunization.

RESULTS: Of the 65,519 infants from this birth cohort in Philadelphia's immunization registry, 54,429 (88.1%) were included in analysis and 12.6% of these were late starters. Infants whose mothers were younger, received less than five prenatal visits, had less than a high school education, had more than two children, and who smoked cigarettes prenatally were significantly more likely to be late starters. Receiving care at hospital/university-based or public health clinics was also significantly associated with likelihood of being a late starter. Neither distance between infant's residence and practice nor neighborhood socioeconomic indicators was independently associated with the outcomes. Common risk factor profiles based on practice type and four maternal characteristics were found to reliably identify infant risk.

CONCLUSIONS: Maternal receipt of fewer prenatal care visits, younger maternal age, higher birth order, and receiving care at public health clinics were the strongest predictors of being a late starter and time to first immunization. Risk factor profiles based on information already collected at birth can be used to identify higher-risk infants. Early intervention and potentially partnering with prenatal care providers may be key strategies for preventing underimmunization.

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