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Title: Meta-Population Modeling to Evaluate Vaccination Policy Alternatives vis--vis Measles Elimination in China

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Abstract: Measles is among the most highly infectious diseases known to man. By virtue of increasingly effective childhood vaccination, together with targeted supplemental immunization activities (SIAs), health authorities in the Peoples Republic of China have reduced measles reproduction number from about 18 to 2.3. Despite substantial residual susceptibility among young adults, more in some provinces and municipalities than others, sustained routine childhood immunization would eliminate measles eventually. To support international efforts to eradicate measles, as well as reduce morbidity and mortality in China, authorities have evaluated alternative strategies. While not the optimal strategy for measles, catch-up campaigns among susceptible schoolchildren could accelerate elimination. The timing would of course depend on uptake. This result is largely due to indirect effects (i.e., fewer infections than vaccinated schoolchildren might otherwise cause), which meta-population models with realistic mixing are uniquely capable of reproducing accurately. Moreover, this strategy would be optimal for rubella. A catch-up campaign using the MMR vaccine within the next several years could avert outbreaks of rubella among reproductive aged adults.
