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A measles outbreak in a middle school with high vaccination coverage and evidence of prior immunity among cases, Beijing, P.R. China.

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Abstract

BACKGROUND: Age-appropriate receipt of ≥ 2 measles-containing vaccine (MCV) doses has been considered evidence of immunity against measles. Transmission of measles is rarely reported among such persons.

METHODS: We report a measles outbreak in a middle school in Beijing that has high coverage with ≥ 2 documented MCV doses. History of previous measles and documentation of MCV receipt were collected for all individuals. Cases were identified by active surveillance and confirmed by laboratory tests. Measles immunoglobulin G (IgG) titers and clinical presentations were obtained for each case.

RESULTS: Of 1331 individuals without a prior history of measles, 1172 (88.1% [95%CI:86.4-91.5%]) and 1078 (81.0% [95%CI:78.9-83.1%]) had age-appropriate receipt of ≥ 2 MCV doses by domestic and U.S. CDC/ACIP criteria, respectively. Thirteen measles cases occurred in the outbreak. The index case and 3 secondary cases were students. The 9 tertiary cases included 2 teachers and 7 students. All 11 student cases received ≥ 2 age-appropriate MCV doses by Chinese domestic criteria; 8 were age-appropriately vaccinated by U.S. CDC/ACIP criteria. Measles IgG was detected during the acute phase of measles for all but 2 cases -the first case and 1 tertiary case. Among students with age-appropriate receipt of ≥ 2 MCV doses, the length of time since the last MCV was significantly associated with risk of measles: for the 1172 students, the risk was 4.6 [OR5.6;95%CI:1.4-22.9] and 5.5 [OR6.5;95%CI:1.4-29.8] times higher when the last MCV dose was 5-9 years and ≥ 10 years prior, respectively, compared with <5 years prior; for the 1078 students, the risk was 4.1 [OR5.1;95%CI:1.3-20.7] times higher when the last MCV dose was 5-9 years prior compared with <5 years prior.

CONCLUSIONS: This is the first report from China showing measles transmission among persons with prior evidence of immunity. Secondary vaccine failure may have played an important role in measles transmission. Further laboratory surveillance is needed to assess the persistence of vaccine-induced immunity of domestically-produced MCV in China.

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KEYWORDS: Immunity; Measles; Outbreak; Secondary vaccine failure

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