Vaccine waning and mumps re-emergence in the USA

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953. Vaccine waning and mumps re-emergence in the USA
Joseph Lewnard, PhD1 and Yonatan H. Grad, MD, PhD2; 1Center for Communicable Disease Dynamics, Harvard T.H. Chan School of Public Health, Boston, Massachusetts; 2Immunology & Infectious Diseases (HSPH) and Division of Infectious Diseases (BWH), Harvard T.H. Chan School of Public Health and Brigham & Women’s Hospital, Harvard Medical School, Boston, Massachusetts

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Background. Following decades of declining mumps incidence amid widespread vaccination, the US has experienced a resurgence in mumps cases since 2006 driven largely by outbreaks on college campuses. The occurrence of cases among previously-vaccinated individuals and in communities with high vaccine coverage has prompted concerns about performance of the live attenuated mumps vaccine (Jeryl Lynn strain) currently included in the measles-mumps-rubella (MMR) series. It is unclear whether the resurgence is due to antigenic changes in circulating mumps virus, which would warrant consideration of a new vaccine, or to waning vaccine-derived protection, necessitating additional booster doses.

Methods. We pooled data from studies of vaccine effectiveness to test for waning of protection. We used mathematical models to measure changes in population immunity since mumps vaccine introduction and to assess whether recent mumps transmission dynamics are consistent with hypotheses of waning immunity or vaccine escape.

Results. We estimate that vaccine-derived protection persists, on average, 29 (95% CI: 17–54) years after receipt of the last dose (Fig. 1). This waning accounts for 66.4% of unexplained variation in estimates of mumps vaccine effectiveness across published studies. Changes in age-specific susceptibility due to vaccine waning and declining transmission track with the current resurgence in cases among young adults in the USA, and explain outbreaks reported among vaccinated adolescents during the late 1980s (Fig. 2). In contrast, vaccine escape would not be expected to result in cases following the observed age distribution (Fig. 3). Routine adult booster vaccination is needed to sustain mumps elimination.

Conclusion. The resurgence of mumps in the USA since 2006 is attributable to waning of vaccine-derived immunity, suggesting the need for booster doses in adulthood. Trials are needed to assess clinical protection afforded by booster doses in individuals with a history of MMR vaccination.

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954. Interdisciplinary Public Health Intervention in a Multigenerational Tuberculosis (TB) Outbreak in Harris County, Texas: A Case Study with Implications for Disease Control Process Improvement and Transmission Cycle Interruption
Aisha Hayne, MD, MPA1; Carlos Plasencia, MD, MSPH1; Kimberly Fields, RN, MSN, FNP2; Tina Nebitt, RN1; Andrea Lovings-Clark, RN1; Mary Scott, RN1; Eliza Wiltz-Beckham, DVM, MPH, MBA1; Brian Reed, MD1; Umar A. Shah, MD, MPH1; 1Disease Control & Clinical Prevention, Harris County Public Health, Houston, Texas; 2Harris County Public Health, Houston, Texas

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Background. Harris County Public Health (HCPH) is the health department for Harris County, Texas jurisdiction. Harris County as a whole is the nation’s third most populous county, with 4.3 million residents, and a TB case rate more than double that of the USA. (7.6 cases per 100,000 pop). A total, 327 individuals were diagnosed with TB in Harris County during 2015, over two-thirds occurring in foreign-born individuals. In 2016, HCPH treated an immigrant female with active TB. Initial contact investigation (CI) yielded five household contacts (HHC). Two tested positive, but refused subsequent clinical evaluation by HCPH. Two months later, HCPH was notified of a HHC hospitalized with TB. After hospital discharge, the sick HHHC moved into a motel in attempts to self-isolate, but refused evaluation of additional HHHC in the home, and banned home access, precluding adequate CI. After numerous phone calls, visits to motel and home, and multiple rescheduled appointment, legal action appeared inevitable. Days later, HCPH was notified of another HHC diagnosed with active TB.

Methods. With alarm regarding the family’s adherence to control orders, TB staff implemented an innovative multidisciplinary team-based intervention in hopes of avoiding legal action. A site visit was paid to the motel by a local health authority, two TB staff, a county public investigator, and a refugee clinic outreach worker fluent in the family’s language. Patients were presented with letters requesting immediate cooperation to avoid court filings. Questions were answered, misinformation corrected, and education provided.

Results. Intermediary on-site intervention using a compassionate, firm multidisciplinary team approach resulted in 16 additional family members tested, yielding an infant with active TB (Case 4) and 8 with TB Infection (TBI). Isolation breaches were discovered. Most importantly, TB transmission cycle was interrupted. Cultural and economic barriers hindering successful interaction with family were addressed, TB misconceptions corrected, and trusting relationship developed.

Conclusion. This innovative multidisciplinary intervention avoided court proceedings and curtailed the TB transmission cycle. HCPH improved its non-adherence intervention process, and modified TB control orders for infectious patients residing in congregate settings.

Disclosures. All authors: No reported disclosures.

955. Retail Meat as a Potential Transmission Source of Community-Acquired Urinary Tract Infection
Reina Yamaji, MD, PhD, MPH1; Julia Rubin, MS candidate1; Cindy Friedman, MD2; Patrick McDermott, MS, PhD3; Melody Hung-Fan, MPH4 and Lee Riley, MD5; 1School of Public Health, University of California at Berkeley, Berkeley, California; 2Division of Foodborne, Waterborne, and Environmental Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia; 3Food & Drug Administration, Laurel, Maryland; 4Contra Costa Public Health Lab, Martinez, California

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Background. Escherichia coli causes approximately 80% of community-acquired UTI (CA-UTI), but the sources of these uropathogenic E. coli infections are not well established. Recent studies have suggested that food, especially poultry, may serve as a source of UPEC. Here we prospectively examined E. coli isolates from patients with CA-UTI and retail meat concurrently available from the same geographic region to determine the frequency of shared genotypes.