Input parameters	Base case	Range	Reference
Assessment of measles immunity (%)			
Pre-existing immunity	84	60–100	Hyle, *Ann Intern Med* 2017
Vaccination with MMR (%)			
Vaccinated at pretravel evaluation	47	20–100	Hyle, *Ann Intern Med* 2017
Exposure to measles while traveling (# exposed/# travelers)			
Any international travel	1.51×10^{-5}	$9.15 \times 1-^{7}$ -1.50×10^{-4}	OTTI 2014
Measles infection, if exposed (%)			
Probability of infection if immune	3	0–5	CDC *MMWR* 2014
Probability of infection if non-immune	90	80–100	CDC *Yellow Book* 2015
Transmission (#)			
Transmitted cases from immune	0	0–5	Fiebelkorn, *CID* 2015
Transmitted cases from nonimmune	4	0–20	Fiebelkorn, *CID* 2015
Contacts per imported case	1,498	3-1,714	Ortega-Sanchez, *Vaccine* 2014
Costs (US$)			
Cost per imported measles case	14,600		Fiebelkorn, *CID* 2015 and *JID* 2010; US DoL 2015
Cost per transmitted measles case	3,300		
Cost per measles case contact	550		Ortega-Sanchez, *Vaccine* 2014; US DoL 2015

Disclosures. **All authors:** No reported disclosures.

2488. Clinical Implications of Asymptomatic *Plasmodium falciparum* Infections in Malawi

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Saturday, October 7, 2017: 2:00 PM

Background. In Malawi, asymptomatic *Plasmodium falciparum* infections are common and make up a substantial proportion of the infection burden. However, the implications of these infections for disease burden are unknown. We do not know if asymptomatic infections eventually progress to clinical malaria or if they persist without effective treatment. This study aims to characterize asymptomatic infections in a region with high transmission and examine the association between persistent asymptomatic infections and clinical disease.

Methods. This study enrolled 120 participants, aged 1–50 years, with uncomplicated malaria (treated with artemether–lumefantrine) and followed them monthly for up to 2 years. Participants presenting with symptoms during follow-up were tested via rapid diagnostic test and treated if positive. Samples from all visits, regardless of symptoms, were tested for parasites using both microscopy and qPCR. Genotyping with *msp1, msp2,* and *glurp* was used to differentiate between new and persistent infections. Asymptomatic infections were defined as infections detected when symptoms were absent, and first detected at least 2 weeks before or after a symptomatic episode. Cox frailty models were used to estimate the association between asymptomatic infections and time between clinical malaria episodes; mixed models were used to estimate the odds of clinical symptoms comparing new to persistent infections.

Results. Analysis has been completed for 1,702 person months of follow-up time. Asymptomatic infections were detected in 23% of visits. After adjustment for age and season, carriage of asymptomatic infections, the longest of which persisted for 16 months, was associated with decreased risk of clinical malaria (HR 0.45, $P < 0.001$) in all ages. When asymptomatic infections preceded a clinical episode, newly acquired infections were detected at 92% of the following clinical episodes. After adjustment for age, sex, and season, clinical malaria was more likely to be due to newly acquired infections (OR 1.3, 95% CI 1.2–1.5) than to a persistent infection.

Conclusion. In a high-transmission setting, asymptomatic *P. falciparum* infections infrequently developed into clinical disease and may be protective against clinical malaria.

Disclosures. **All authors:** No reported disclosures.

2489. Silent Polio Transmission: A Spatial Analysis

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Session: 277. Global Infections
Saturday, October 7, 2017: 2:00 PM

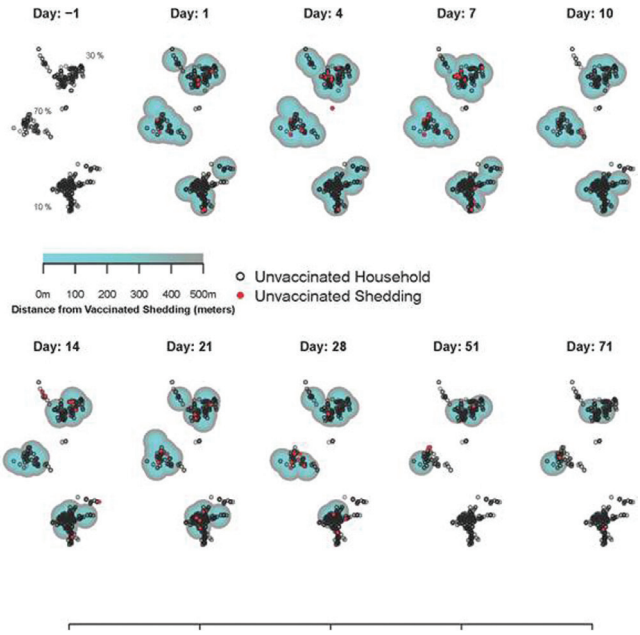
Background. As wild poliovirus is eradicated and countries switch from Oral Polio Vaccine (OPV) to Inactivated Polio Vaccine (IPV) per WHO recommendations, preventing circulation of vaccine-derived poliovirus is a top priority. However, spatial dynamics of OPV transmission are not well understood. Understanding these trends will improve resource targeting in the event of OPV reintroduction in undervaccinated communities. Mexico provides a natural environment to study OPV as it provides IPV routinely and bi-annual OPV campaigns.

Methods. Children in three villages near Orizaba, Mexico were randomized to three levels (10%, 30%, 70%) to receive OPV. We measured distance to nearest OPV shedding, and the amount of shedding close to unvaccinated individuals. We used maps to show the proximity and amount of shedding. Distance and density of shedding was analyzed separately using mixed effects logistic regression with random effects for household and time, adjusted for age, gender, area, and running water.

Results. The median distance to nearest OPV shedding was 85 meters (IQR 46, 145). The median number of shedding individuals within 200m was 3 (2, 6). Shedding and between household transmission occurred rapidly with unvaccinated individuals shedding on day one of the study (Figure 1). There was little evidence (Odds Ratio [OR] 1.04 (95% Highest Posterior Density [HPD] 0.92, 1.16)) of an association between distance (per 100 m) from OPV shedding and odds of shedding. There was some suggestion that the number of OPV shedding within 200 m may have some effect on unvaccinated shedding with OR 0.93 (HPD 0.·84, 1·01) but not at 100 or 500m. Results were consistent across the three villages.

Conclusion. Household structure appears to have limited value in predicting transmission of poliovirus shedding. The use of OPV results in rapid but low levels of transmission throughout the community and this would usually go undetected. The only way to avoid this is to not use OPV or to have strong controls such as quarantine, or strict hygiene protocols. After withdrawal of OPV worldwide the decision to reintroduce due to an outbreak should not be taken lightly as it appears a small amount of OPV is needed to result in transmission.

Figure 1. Contour Plot: Shedding Over Time.



Disclosures. **All authors:** No reported disclosures.

2490. Phylogenetic Analysis of an Unusual Increase in *Salmonella enterica* serovar Paratyphi A Infection among Travelers Returning from Myanmar

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