

Transmission of influenza virus in mother-infant pairs in rural Nepal

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INTRODUCTION

- > Influenza virus can cause severe respiratory illness in young infants, however vaccination is not recommended for infants <6m
- > Maternal influenza vaccination can prevent infant infection through maternal antibodies and preventing maternal illness
- > We aim to describe transmission of influenza virus in mothers and their infants in rural Nepal

METHODS

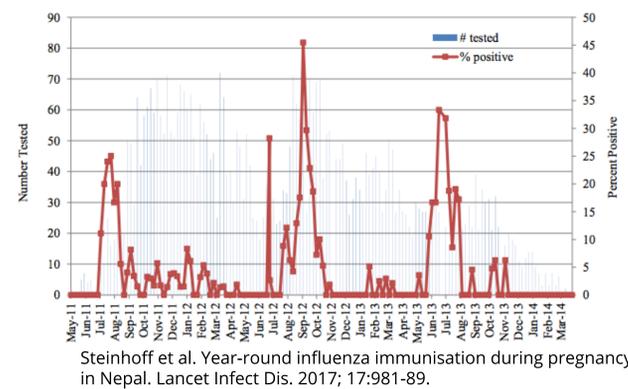
- > Pregnant mothers were enrolled in a randomized control trial of influenza immunization from 4/2011 to 4/2013 in rural Nepal
- > From 4/25/2011 to 11/15/2012, vaccine contained A H3N2 Perth, A H1N1 California, and B Brisbane (V) between 11/16/2012, to 9/9/2013, vaccine contained A H3N2 Victoria, A H1N1 California, and B Wisconsin (Y)



- > Mothers and infants were monitored for respiratory illness from enrollment through 180 days postpartum
- > A nasal swab was collected if mother had fever + cough, sore throat, rhinorrhea, nasal congestion or myalgias and if infant had subjective fever, cough, draining ear, wheeze, or difficulty breathing in last seven days
- > We defined transmission episodes as mother/infant pairs with influenza-positive illness within 14 days of each other
- > Nasal swabs were collected at time of illness and tested for influenza virus by RT-PCR
- > Influenza was subtyped using RT-PCR & mass spectrometry

RESULTS

Figure 1. Total study respiratory samples collected from May 2011 to March 2014 in blue (left axis). Percent of respiratory samples positive for influenza by RT-PCR in red (right axis).



- > Influenza transmission occurred in 17 (0.2%) of 3,646 mother-infant pairs

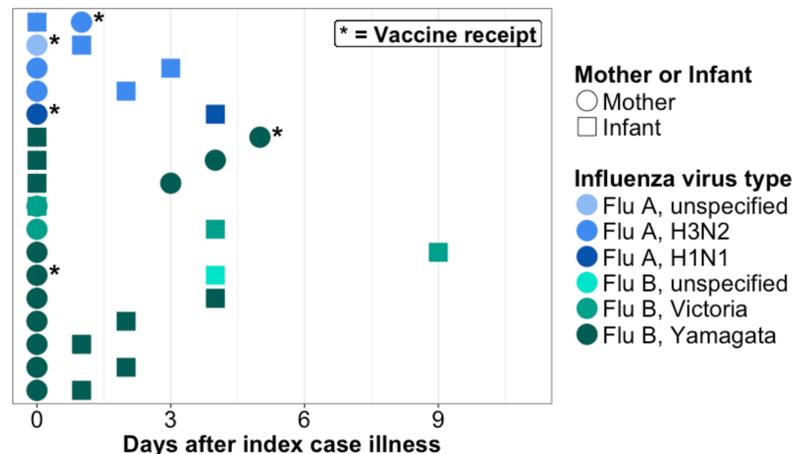


Figure 2. Influenza transmission events in 17 mother-infant pairs. Symbols represent the first day of respiratory symptoms associated with influenza-positive illness. Asterisk indicates the mother received study influenza vaccine. Influenza A subtypes determined by RT-PCR. Influenza B lineages were determined by RT-PCR/mass spectrometry.

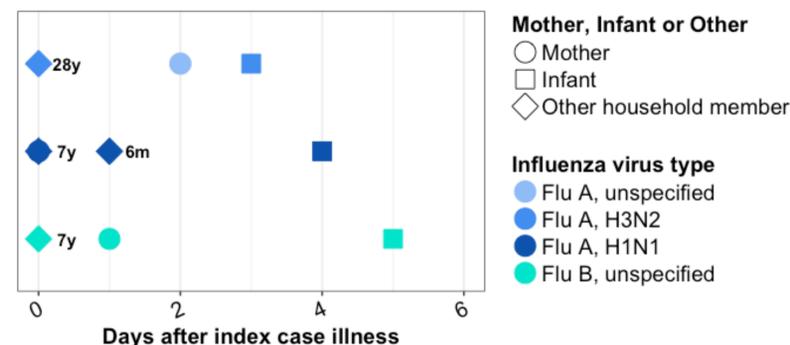


Figure 3. Other household members with influenza-positive illness during mother-infant influenza transmission episodes.

RESULTS

Table 1. Characteristics of mother-infant influenza transmission episodes

Transmission characteristics	N (%) or median (IQR)
Maternal index case*	12 (70.6)
Serial interval (days)**	3 (1, 4)
Received influenza vaccination***	5 (29.4)
Influenza A	5 (29.4)
Synonymous strains****	10 (90.9)

*Mother and infant illness started on the same day in one of 17 pairs
 **Number of days between start of index case illness and start of secondary case illness
 ***Two mothers infected with Flu B (Yamagata) received vaccine containing Flu B (Victoria) strain
 ****Out of 11 pairs fully evaluated by subtyping assays

CONCLUSIONS

MOTHER-INFANT INFLUENZA TRANSMISSION

- > In the majority of mother-infant pairs, mothers were the first to acquire influenza virus and may be an important source of influenza transmission to infants
- > Multiple subtypes circulated simultaneously, though the same subtype was documented in both mother and infants suggesting transmission in almost all cases
- > Vaccination during pregnancy may have the additional benefit of preventing influenza transmission to infant after birth

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