Meningitis outbreak investigation-Kembata zone, Southern Ethiopia, February, 2011

D. Dalecha
Addis Ababa University, Addis Ababa, Other, Ethiopia

**Background:** Meningitis is a serious bacterial infection of the meninges often caused by *N. meningitides*. Epidemics occur in 8-12 year cycles, usually in the dry season, across the African meningitis belt. Serogroup A meningococci are most prevalent. Crowded living conditions facilitate transmission. Ethiopia is along the eastern edge of the meningitis belt and sporadic outbreaks occur. In February 2011, a hospital reported a suspected meningitis outbreak to regional public health emergency officials. We investigated to confirm the etiology and extent of the outbreak and recommend prevention and control measures.

**Methods:** To identify suspected cases a house to house search was conducted in Azedaboo and Zatoshodera kebeles of Kedida gamella woreda from March 4-13, 2011. Health extension workers were interviewed to identify additional cases. We also reviewed patient and laboratory registers at Durame Hospital. From these sources we compiled a line list of suspected cases defined as any person with sudden onset of fever (>38.5°C rectal or 38.0°C axillary) and one of the following signs: neck stiffness, flaccid neck, bulging fontanel, convulsion or other meningeal sign. Data were analyzed using Epi Info and MS-Excel.

**Results:** A total of 46 cases and 6 deaths (CFR 13%) occurred over a six-week period from January 18 to March 1, 2011. The median age was 13 years with a range from 5 months to 55 years. More than 80% of the cases were below 30 years of age. Gram stain was conducted on cerebrospinal fluid (CSF) samples from a sample of 10 cases and 8/10 (80%) contained gram negative diplococcic suggestive of *N. meningitides* presence; 1/7 (14%) was culture positive for *N. meningitides* serotype A. Vaccination for meningitis is not routine in the affected area. A prolonged dry season occurred prior to the outbreak and crowded living conditions were documented.

**Conclusion:** A laboratory confirmed outbreak of *N. meningitides* Serogroup A occurred in Kembata zone of southern Ethiopia. The lack of vaccine, crowded living conditions, and extended dry season may have contributed to the outbreak. Routine vaccination for meningitis should be considered.

http://dx.doi.org/10.1016/j.ijid.2012.05.886

Predicting the emergence of predominant DENV-1 with potential to cause major outbreak in Malaysia

M.B. Danlami 1,*, B.T. Teoh 1, J. Abd-Jamil 1, N.M. Mahadi 2, S. Abubakar 1
1 University of Malaya, Kuala Lumpur, Malaysia
2 MALAYSIA GENOME INSTITUTE, Selangor, Malaysia

**Background:** Dengue is a major mosquito-borne tropical disease that is rapidly spreading to many countries of the world. Prevention against dengue depends largely on vector control, disease surveillance and protection from bites by infected mosquitoes. In endemic countries, dengue outbreak involving homogenotypic and heterogenotypic viruses occur at regular cyclical pattern. There are evidences suggesting that immune escape viruses with fitness advantage could be the progenitors of future outbreak virus and this information is useful for the effective development of dengue vaccines.

**Methods:** Truncated dengue virus envelope protein was cloned and expressed on phage M13 g3p attachment protein. Using site-directed mutagenesis, four single mutations at E171, E272, E305 and E390 was engineered onto the recombinant E. Effects of these mutations on binding to insects and mammalian cells were determined. Polyclonal antibodies generated against these antigenic proteins were used in micro-neutralization and foci reduction neutralization assays.

**Results:** Out of the four mutations engineered to mimic potential immune escape epitopes, two mutations(E272 and E390) were demonstrated to affect binding of the recombinant proteins to C6/36 mosquito and Vero cells. The mutations at E272 and E390 also affected polyclonal antibodiesbinding to two of the dominant dengue virus with E390 showing significantly reduced binding. A four-fold reduction in the number of foci formed in the presence of polyclonal antibodies against three of the five dominant dengue virus strains was also observed.

**Conclusion:** Results from the study suggest that mutation at E272 and E390 could play a major role in future dengue virus type 1 outbreak in Malaysia.

http://dx.doi.org/10.1016/j.ijid.2012.05.887