

positive attitude towards prevention of cholera and cholera vaccine. One third of the respondents did not have good practice for prevention of cholera. Lack of adequate supply of water and gas to boil water, unconsciousness, high density of population and living places surrounded by drainage water were identified as reasons for not having good practice.

This study shows significant association between respondents' knowledge and sex, education, occupation, monthly household expenditure, attitude and practice ( $p < 0.05$ ). In the adjusted model, female were 74% less likely to have poor knowledge than male (Odds Ratio (OR): 0.74; 95% CI: 0.62–0.87). Compared to respondent's high monthly household expenditure ( $> 128$ US\$), the significant odds (OR: 1.31; 95% CI: 1.09–1.58) was found with the respondents who had monthly lowest household expenditure ( $\leq 93$ US\$) that they were more likely to have poor knowledge.

**Conclusion:** This study recommended to strengthen health education activities to improve knowledge of low socio-economic group of people on cholera and cholera vaccine and emphasized the importance of mass cholera vaccination to prevent and control cholera.

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#### A forecasting system for dengue fever in Nakhon Si Thammarat, Thailand

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**Background:** Monitoring and predicting dengue incidence can facilitate early warning and disease control and prevention. Weather variables are potential predictors of dengue incidence. This study explored the impact of weather variability on the transmission of dengue fever in Nakhon Si Thammarat, Thailand.

**Methods:** Data on monthly-notified cases of dengue fever over the period 1981–2011 were collected from the Bureau of Epidemiology, Department of Disease Control, Ministry of Public Health. Weather data over the same period were obtained from the Thai Meteorological Department (TMD). Spearman correlation analysis and time-series adjusted Poisson regression analysis were performed to quantify the relationship between weather and the number of dengue cases.

**Results:** The incidence rate was first-order autoregressive indicating that the dengue incidence rate in the current month was related to the incidence rate occurring in the previous month ( $\beta = 0.848$ ,  $P < 0.001$ ). Maximum and minimum temperature at a lag of zero month had a positive effect on dengue incidence (maximum temperature:  $\beta = 0.104$ ,  $P < 0.01$ ; minimum temperature:  $\beta = 0.180$ ,  $P < 0.01$ ). The amount of rainfall at a lag of two months had a positive effect on dengue incidence ( $\beta = 0.0004$ ,  $P < 0.05$ ). The time series Poisson regression model was constructed with the data for the period January 1981–December 2011. The model demonstrated goodness-of-fit with a correlation between observed and predicted number of dengue incidence rate of 72.74%.

are significant weather predictors of dengue incidence in Nakhon Si Thammarat. This model could be used to optimize dengue prevention by predicting trends in dengue incidence. Accurate predictions for even a few months ahead provide an invaluable opportunity to mount a vector control intervention or to prepare for hospital demand in the community.

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#### Measles outbreak investigation - Keffa zone, SNNP regional state, Ethiopia, January 2012

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**Background:** Measles is a major contributor to child-mortality worldwide and kills approximately 1–3 of every 1000 infected individuals, even in developed countries. Measles is a leading cause of vaccine-preventable deaths among young children. Kaffa zone has been reporting suspected measles cases since 12-Oct-2011. The investigation was conducted to identify the etiologic agent, magnitude of the outbreak and to undertake prevention and control interventions.

**Methods:** Patient observation was made at health centers and active cases were searched house to house. Registration books were assessed and suspected-measles cases were identified from 12-Oct-2011 to 17-Jan-2012 in Keffa zone. Cases were defined as: maculopapular rash with fever  $\geq 38.5$  °C with coryza, conjunctivitis or cough. Suspected-measles cases were epidemiologically linked by contact with laboratory confirmed outbreak in neighboring districts. Immunization coverage and vaccine cold chain were assessed. Specimens were collected and tested at national measles laboratory. Descriptive analysis was conducted using Epi-Info version 3.5.3 and arc geographic information system.

**Results:** A total of 2866 suspected-measles cases (Attack Rate (AR): 1.0%) with 7 deaths (Case Fatality Rate (CFR): 0.2%) were identified. The AR was 1.6% in Gesha, 1.5% in Sailem, 1.0% in Gewata, 0.6% in Bita, 0.5% in Adiyo and 0.2% in Chena districts of Keffa zone. Males and females were almost equally affected (AR: 0.2% vs. 0.3%). The AR was 2.9% among  $< 5$  years of age and decreasing to 1.6% among 5–14, 0.2% among 15–44 and 0.01% among  $\geq 45$  years of age. All deaths and 2167 (75.6%) of the cases were not vaccinated against measles. The average vaccination coverage was 61%. Inspection of refrigerators used for vaccine storage identified 2/5 (40%) that were not functional due to poor maintenance. Eight specimens were collected and 6 of them were tested positive for measles IgM.

**Conclusion:** An outbreak of measles occurred in Keffa zone affecting primarily those  $< 5$  years of age. Low vaccination coverage and non-functional cold storage likely contributed to the outbreak. Non-selective mass vaccination campaign should be given for children from six months to 14 years old. Enhancing routine vaccination coverage and improvement in cold chain operation and maintenance need to be emphasized in the zone to reduce measles incidence.

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