

tract infection seen at the UMMC. The viruses are also isolated from children with HFMD but there is no evidence that link them to HFMD.

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### Review of Epidemiological Risk Factors of Measles Outbreak in Displaced Population

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**Background:** Despite the availability of measles vaccines since 1959, measles still remains an important public health problem. Particularly, high case fatality rates up to 33% have been reported in displaced populations after a disaster.

**Objectives:** This study defines the epidemiological risk factors of potential measles outbreak among displaced populations after a disaster.

**Methods:** A systematic literature review was conducted and a total of 64 literatures that met the criteria were selected from Pub-Med and Medline. The reports and guidelines from World Health Organization and Center for Diseases Control and Prevention were also reviewed.

**Findings:** Low vaccination coverage among displaced children in camps and surrounding communities and the lack of periodic vaccination were a main risk factor for measles outbreaks. Refugees' movement and high density has contributed to measles transmission while malnutrition was associated with high case fatality. Moreover, intervention for measles control were often disrupted by ongoing conflict (Sudan 2004), or limited road access (Afghanistan 2001). Accessibility to health care may be limited due to the destruction of health infrastructures (Mexico 1985). Surveillance for measles outbreak detection was often weak due to the rapid alternation of the national surveillance system; specifically when the disaster occurred in countries with limited laboratory capacities and/or lack of trained health staff for surveillance. No adequate surveillance system has been documented specifically for disasters and refugee settings, but syndromic surveillance together with active cases findings were often performed.

**Conclusion:** Morbidity and mortality from measles was often increased after a disaster under circumstances including population movement, malnutrition and low vaccination coverage in addition to the disruption of the health system. Measles is a significant infectious disease in displaced population. More systematic measures should be taken to reduce a risk of measles in such population.

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### Survey of Protective Measures and H5N1 Seroprevalence Among Bird Collectors During An Avian Influenza A/H5N1 Outbreak on Ruegen, Germany, February-March 2006

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**Background:** In Germany, the first outbreak of highly pathogenic avian influenza (HPAI) A/H5N1 occurred among wild birds on the island of Ruegen between February and April 2006. Of 1,878 tested birds 9% were positive for HPAI A/H5N1. We launched an investigation to assess the use of the protective measures among bird collectors, and to estimate their seroprevalence of H5N1-antibodies.

**Methods:** Inclusion criteria of our study were participation in collecting wild birds on Ruegen between February and March 2006. Study participants were asked to complete a questionnaire, and to provide blood samples. We evaluated the use of protective measures by using a personal protective equipment (PPE)-score between 0 and 9, where 9 corresponds to a continuous and complete use of PPE. Sera were tested for H5N1-antibody by plaque neutralization (PN) and microneutralization (MN) assays. Reactive sera were reanalysed by the World Health Organization (WHO)-Collaborating Centre, London by MN and Hemagglutination inhibition assays.

**Results:** 159 firemen, local administration employees and veterinarians fulfilled the inclusion criteria. Of those, 97 participated in our study. Forty-seven (50%) of 94 participants achieved a PPE-score between 7.0 and 9.0. PPE compliance was higher in firemen (mean PPE-score: 6.6) than in local administration employees (mean PPE-score: 4.5,  $p=0.006$ ). Firemen were more likely to have been instructed for the correct usage of PPE ( $p=0.05$ ). There were no reports of influenza-like illness. Seventy-eight out of 97 participants provided blood samples. Six of the samples were initially reactive by PN assay, but confirmatory tests by the WHO-Collaborating Centre were negative.

**Conclusions:** No person involved in the collection of wild birds with potential HPAI A/H5N1 was infected with A/H5N1. Usage of PPE was not always optimal. However, providing instructions before first use improved the overall good practice of PPE use.

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