serum samples was performed according to the WHO standard method.

**Results:** 9 of 13 isolates in type 1, 23 of 25 isolates in type 2 and 16 of 29 isolates in type 3 were virulent VDPVs. Seropositivities against the virulent type 1 and 2 VDPVs were more than 90%, but the values against the virulent type 3 VDPVs were approximately 60%. Also, neutralizing antibody titers against the virulent type 3 VDPVs were the lowest in comparison with the titers against the virulent type 1 and 2 VDPVs.

**Conclusion:** Our results suggest that Japan’s vaccination policy, a 2-dose administration of OPV, might be enough to prevent an epidemic of poliomyelitis caused by virulent type 1, 2 and 3 VDPVs, even though the seropositivity and antibody titers against type 3 viruses were the lowest. However, a booster dose of the vaccine for the type 3 virus is recommended.

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**A Pilot Study for Evaluating a Nation-wide School-based Influenza Vaccination Program in Taiwan**

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**Background:** Epidemic influenza causes serious mortality and morbidity in temperate, subtropical, and tropical countries annually. Recent studies show that school-age children are the major spreaders of influenza transmission, and also strong evidences prove that vaccinating schoolchildren against influenza is the cost-effective way to reduce influenza-related morbidity among children and their households. Thus, Taiwan CDC has decided to provide the flu shots focusing on first and second grade students in the entire country since November 1, 2007. The aims of this pilot study were to assess the feasibility of a school-based influenza vaccination program and to evaluate the impacts on the households.

**Methods:** During fall 2007, we recruited 8 elementary schools from four counties/cities including 4 intervention schools assigned to vaccinate all students and 4 control schools only on first and second grade students. Written informed consent was obtained from the parents of the children who participated in this study. All households with children included in this study were surveyed by a weekly diary to record influenza-like illness (ILI). School nurses were trained to collect a small validation set of throat swabs from the children with acute ILI symptoms.

**Results:** There were 3,784 students (57% of the 6,671 students in 8 schools) participating in this study. The vaccine coverage for the intervention and control schools were 45% and 19% respectively. By February 1 2008, 96 throat swabs had been collected, and 6 of them were positive for influenza virus. Since the study is still ongoing, the weekly diary and throat swabs will be collected until the end of April, 2008. Further results for the impacts on the households will be analyzed and discussed later.

**Conclusion:** Lessons learned from this pilot study will provide further guidance for evaluating the school-based influenza vaccination study in 2008-2009 season.

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**Frailty and Immune Response to Pneumococcal Vaccines Among the Elderly Hospitalised Patients**

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**Introduction:** The elderly, despite being most at risk for invasive pneumococcal disease, respond poorly to polysaccharide vaccine. Conjugated vaccine technology overcomes this problem in children aged <2 years, but conjugated vaccines are not licensed for use in adults. Clinical predictors of response to vaccines other than chronological age may assist in targeting adults in most need of a more immunogenic vaccine. An index of frailty (FI) has gained support as a measurement tool, but has not been examined as a predictor of immune responsiveness.

**Aims:** To determine the response to 23 valent polysaccharide (PPV) and 7-valent conjugate (PCV7) pneumococcal vaccines in the elderly by level of frailty.

**Methods:** A randomized controlled clinical trial of hospitalized elderly was conducted. Subjects were randomised to receive PPV or PCV7; those who received PCV7 received PPV 6 months later. Serology was measured by enzyme immunoassay (ELISA) against four serotypes, 4, 6B, 18C and 19F.

**Results:** For all four sero types there were statistically significant increases in geometric mean concentrations after immunization; however there were no difference between 23PPV and PCV7. There association between frailty scores and geometric mean concentrations (GMC) varied by serotype. For serotype 4, there was a clear relationship between response and frailty - responses decreased with increasing frailty. This relationship was seen to a lesser degree for serotypes 18C and 19F. Type 6B is considered to be a poor immunogenic and there were very little change in both groups from baseline to 6 months.

**Conclusions:** We demonstrated the more frail patients had a poorer immune response to polysaccharide and conjugate pneumococcal vaccines, except for serotype 6B, where responses were poor in all groups. The use of a frailty index may be more suitable than age alone to determine people at risk of poor vaccine responses.

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