

# The positive rate of measles, rubella and mumps reported cases and search for the other possible etiology

## Abstract

**Purpose:** MMR vaccine has been given to all 15-month old infants since 1992. Looking in the case reports beginning from then, we found that the number of reported cases of measles and rubella dropped below 100 per year in 1993 and 1998, respectively. We also noted that 179 mumps cases were reported in 1995, which happened to be the lowest annual rate in its history. In most other years the rate remained in a range of 300 to 400 cases, but doubled in 2004. The ratio range of confirmed cases versus reported ones has been 10 to 30% and 4 to 30% for measles and rubella since 2000, respectively, but the real incident rate of mumps remains unclear because lacking of adequate specimens for laboratory confirmation in the past. In this study, we were to sample all reported mumps cases reported in 2006 in order to estimate the real incidence for mumps. At the same time, we also wanted to actively monitor the etiology of other viral infections, which might cause similar clinical symptoms as measles, rubella, and mumps do, in order to set up an orderly database for differential diagnosis. After all, we hope such laboratory diagnosis practice could result in improvements of the accuracy of our clinical diagnostic routines.

**Method:** Aside from the confirmation tests performed in every reported measles and rubella cases via the existing infectious diseases reporting system, we also intend to check serology data of B19 and HHV-6, and HHV-7 markers, which are considered to be clues for etiology of erythema infectiosum and roseola infantum, respectively. In addition, we would try to look for other viruses that may also cause febrile rash illness via viral culture method. For mumps-like reported cases, except carrying out laboratory mumps confirmation tests, we also want to do serology check for EBV virus for differential diagnosis and culture for other possible viral etiology as well.

**Result:** There were 23 reported measles cases up to the end of November 2006, and out of them 4 were confirmed measles cases, one turned out to be rubella confirmed case. Seven cases showed HHV-6 positive in serology, 3 cases were HHV-7 positive in serology, and 3 enteroviruses were cultured. In 53 rubella reported cases, there were 6 confirmed rubella cases, 6 positive in B19 serology, 17 positive in HHV-6 serology and 3 cases were cultured positive in enteroviruses. In 892 reported mumps cases, we got 864 case's specimen, out of which 4 were confirmed as mumps cases, 24 cases were EBV positive in serology, 3 cases got positive HSV-1 cultured, two were cultured positive in adenovirus and 19 cases got positive culture results in enterovirus. Aimed at all reported measles, rubella and mumps cases, we estimate the seroprevalence rate in these three viruses and excluded the confirmed cases as susceptible ones, we classified all cases in different birth generations into three groups, i.e. non-vaccinated group, one-dose-MMR vaccinated group, and two-dose-MMR vaccinated group, and we found that the seronegative rate was 6.1%, 2.4%, and 16.5% in measles, rubella, and mumps, respectively, in the one-dose-MMR group, while in the two-dose-MMR group, the seronegative rate for measles, rubella, and mumps was 5.9%, 0.9%, and 6.2%, respectively.

**Conclusion and Suggestion:** 1. The numbers of confirmed cases of measles, rubella and mumps were each under 10 that indicate the MMR vaccine was effective in preventing measles, rubella, and mumps. 2. One dosage of MMR vaccine cannot reach herd immunity over 90%, two dosage project seems to help to promote herd immunity. 3. The generation who got one-dose-MMR vaccination should also get at least one measles vaccine boost, and the two MMR vaccinated generation should get at least 3 measles containing vaccine accordingly, but the seronegative rate couldn't be cut down to under 5%, what may influence on the measles elimination goal due in 2010 and it was worth to think seriously about. 4. According to the extra high account of reported but low positive cases in mumps, we should recheck the clinical reported criteria and reinforce the clinician how to differentiate between virus parotitis

(mumps) and other parotitis not caused by mumps virus, for example, Juvenile recurrent parotitis or primary Sjögren syndrome.

**Keywords:** MMR vaccine, erythema infectiosum, roseola infantum, HSV-1, adenovirus, enterovirus, Juvenile recurrent parotitis, primary Sjögren syndrome