

# An outbreak of measles in Najran valley, January to March, 1997

From January 1 to March 12, 1997 (22 Shaban to 3 Dhu al Qada 1417), Preventive Medicine Department (PMD) of Najran health affairs reported an unusual increase in measles cases (46) in towns in the Najran valley. From 1992 until this time only 69 cases had been reported from all Najran region. An investigation was begun to discover the extent of the outbreak, to evaluate the existing measles vaccination program and to evaluate the surveillance system.

We defined an outbreak - associated case of measles as a febrile illness with a generalized maculopapular rash lasting at least three days and cough, coryza or conjunctivitis that occurred between December 25, 1996 through March 12, 1997 in a resident of Najran valley (Figure 1). We sent a new circular to all government and private health facilities requesting that they report all measles cases to PMD within 24 hours. We then reviewed student records for absenteeism in all affected schools. We also interviewed all family members of reported measles patients to determine immunization history and previous measles. We compared measles case-patients to three control-persons for each case-patient >13 years of age and five control-persons for case-patients ≤13 years of age randomly from the neighborhood. We reviewed all case and control files from the PHCCs.

The first measles patient was an unvaccinated 23 year old Saudi male who had been exposed to a measles patient when visiting a friend in Nammas, Asir region. He returned to Najran on December 23, 1996 and developed measles symptoms on December 25, 1996 while staying with his cousin. His cousin showed symptoms of the disease 12 days later and the cousin's brother showed symptoms of the disease an additional 10 days after the cousin. The cousin's brother was a member of a football team. One of the team players who was in close contact with the brother later developed measles symptoms. Subsequently, four distinct chains of

transmission were identified. One originated from a second imported case from Riyadh. Of 19 primary cases two were imported, five had exposure in a school, six had visited a medical facility and six had unknown contact in the community.

The attack rate (AR) for measles in Najran valley during this period was 23/100,000 persons. Cases were scattered among 24 families within five PHCC catchment districts. Students with measles were scattered among 15 schools. One school had five cases, one had three cases, and the rest (13) had one case per school.

The age of case-patients ranged from six months to 41 years (median 17 years). Most measles case-patients (74 %) were > 13 years of age. The highest AR was among Saudi males aged five to 19 years. Of cases, 25 were in males (71%) and 10 in females (29%). The sex ratio for children under 12 years was 1:1 (two cases in males and two in females) and for children 12 years and older M:F sex ratio was 2.8:1 (23 cases in males and eight in females).

A comparison of measles vaccination history between measles cases and controls showed prior measles vaccination in the age group >13 years gave protection and was within the expected level of vaccine effectiveness (95%) for measles vaccine. We were unable to estimate the vaccine effectiveness in the children

aged from one to 13 years as there were not enough unvaccinated persons.

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**Editorial note:** This measles outbreak propagated throughout a highly vaccinated population by contact among persons born before the year of universal measles vaccination (1983). This was reflected by the high median age of measles cases. The small number of cases in children under 13 years of age shows the effectiveness of the measles immunization program in Najran. The MMR vaccine, given to girls at age 12 for rubella control, is probably the reason few females were affected. In more isolated rural areas of Saudi Arabia, immunity from naturally acquired measles infection will be less common among older children and young adults.

MMR vaccination for boys as well as girls aged 13 to 20 years in rural areas of Saudi Arabia could help limit measles outbreaks.

Figure. Measles case distribution by week of onset, 1996-1997, Najran Valley, Saudi Arabia.

