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ELIMINATION OF MEASLES, MUMPS, AND RUBELLA - THE SWEDISH EXPERIENCE

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Elimination of measles, mumps and rubella - the Swedish experience

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The object of the Swedish programme is to eliminate measles, mumps and rubella by covering at least 90% of the target population by vaccination. The national vaccination schedule comprises two doses of a combined vaccine to each individual, at 18 months and 12 years. Thus, there has been no campaign to vaccinate several age classes simultaneously.

The vaccine, Virivac, is registered by the Natl. Bact. Lab. in Sweden according to licences from MSD and Wellcome. The first vaccine dose is administered by the Child Health Centres and the second dose by the School Health Care, in both instances free of charge. The programme started in 1982.

The programme is surveyed and evaluated by four systems

- Morbidity reports (clinical and laboratory verified cases of measles, mumps or rubella)
- Reports on vaccine utilization from Child and School Health Care
- Reports on adverse reactions
- Seroepidemiological studies

Among the preschool children, 93% of the children born in 1979-1983 had been vaccinated at the end of 1985. 91% of the 12 year old schoolchildren had received their second dose. The coverage is expected to be 92% during 1986.

In the seroepidemiological studies at the Dept. of Epidemiology at the Natl. Bact. Lab. (M Böttiger et al) by hemagglutination in gel (HIG) and neutralization tests (NT) 98, 92 and 99% converted to measles, mumps and rubella respectively after vaccination at 18 months. 100% were seropositive after the vaccination at 12 years.

When the combined vaccine was introduced in 1982, 56% of the preschool children had already been vaccinated against measles, most of them after 1975. The 12 year old children were then seropositive in 89%. Therefore, only a small proportion of children seems to be unprotected against measles. The numbers of cases due to measles have dropped during the 1980:ies from peaks about 20,000 cases or more reported annually before 1975 to a minimum of about 300 cases in 1985 and further low monthly figures in 1986 (compulsory reports from all general practitioners).

The proportion of children without detectable antibodies to mumps is estimated to be higher than against measles except for the children that have received their second vaccine dose during school.

It seems that the level of reported cases is declining but due to the usual four year interval between the peaks it is too soon to assess the impact of the vaccination (the most recent peak appeared in 1983/84). As a comparison to the 300 cases of measles in 1985, about 1,300 cases of mumps were reported.

As for rubella, 12 year old schoolgirls had been vaccinated since 1974. The coverage was about 96%. In the seroepidemiological surveys in 1985, tests of 18 year old girls and boys showed up to 100% seropositivity in the girls but only 70-80% in the boys. Rubella caused peaks well over 10,000 reported cases in 1969, 1974 and 1979 but the peak in the spring of 1985 reached only about 5,000 cases. The laboratory confirmed cases showed a clear male predominance in the age groups where the girls had been vaccinated (15 to 24 years) while in younger ages there was no difference in morbidity between the sexes. Over 200 side reactions have been reported to The Swedish Adverse Drug Reactions Advisory Committee, mainly fever and/or rash. The most serious reaction was a case of polyradiculitis in a 12-year old girl. Four cases of encephalitis were reported and 11 cases of parotitis.

Conclusion

The aim to cover at least 90% of the children in the vaccinated groups with two doses of a combined vaccine has been reached. The seroconversion has been found to be close to 100%. The adverse reactions have not been more frequent than expected. The programme has been well received by the public and the medical professionals.

The immunity and morbidity studies suggest that measles will be the first that may be eliminated. The number of cases has dropped to a low level. For mumps it is too soon to expect a marked effect already after three years of vaccination. The age groups between five and nine years where mumps is most frequent are not yet vaccinated. A complete immunity has not yet been reached for rubella but due to the high coverage and seroconversion combined with the relatively low rate of transmission the epidemic of 1985 might be the last.