EDITORIAL

Rubella Immunization in Malaysia - 20 Years on, and the Challenges Ahead

A Narimah, MPH

Division of Family Health Development, Ministry of Health Malaysia, Block E 10, Aras 7 & 8, Parcel E, Pusat Pentadbiran Kerajaan Persekutuan, 62590 Putrajaya

Twenty years ago in 1985 a pilot project for a national rubella immunization programme was carried out by the Ministry of Health in four states, following two years of planning including a thorough review for justifying the programme[1]. It was clear then that active immunization against rubella was the only effective way of preventing and subsequently eliminating congenital rubella syndrome (CRS), by far the most important consequence of rubella infection and the most compelling justification for a national immunization programme. Measures like isolation of infected persons to segregate them from infecting a pregnant woman are not feasible, for many reasons, not least of them being the fact that a large majority of infections remain sub-clinical, and if at all manifested, the symptoms vary and are generally mild.

The national roll-out began in Negeri Sembilan in 1987, and by April 1988, rubella vaccine was incorporated in the national EPI (Expanded Programme for Immunisation). Sarawak state had begun in 1983 immunisation against rubella following a sero-epidemiology study in 1982 which showed two-thirds of primary six school girls were susceptible.

At that time, the vaccine derived from the viral strain Wistar RA 27/3, available since 1979 has been used by many countries with positive reports. Even before that, the experiences of USA and UK, which began national immunization in 1969 and 1970 respectively, using the older HPV-77 and Cendehill vaccines, were already well known. The USA adopted the universal strategy, vaccinating all children (girls and boys) while the UK adopted the selective strategy, vaccinating only pre-puberty girls and non-pregnant women. Singapore began national rubella immunisation in 1976, using the selective (UK) approach. Since then much knowledge has emerged on the comparative strengths and weaknesses of the two strategies, and the wisdom of adopting a combined strategy. The universal strategy that vaccinates children leaves older people susceptible thus exposing women to possible infection and CRS. The selective strategy leaves younger children unimmunised, who then are susceptible and at as potential sources of infection for the adult woman.

Rubella is not a notifiable disease in Malaysia; thus for the programme planning in 1983-1985, burden of disease/infection were gauged from various sources such as hospital records, disease outbreaks reports, serological surveys, laboratory reports, and in particular the TORCH'S project of the IMR (laboratory surveillance of congenital infections by toxoplasmosis, rubella, cytomegalovirus, herpes and syphilis). From these, it was seen that government hospitals admitted between 50 to 230 cases of CRS a year, outbreaks in closed institutions occurred from time to time (in 1983 alone there were three outbreaks in institutes of higher learning which generated some degree of anxiety among women of child bearing age), serological surveys indicated about 40% of female population in childbearing age being susceptible, and that rubella was the commonest cause of congenital anomalies.

In 1987, the national EPI in Malaysia covered the "big six" target childhood diseases (tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis and measles) advocated by the WHO and UNICEF, following the eradication of smallpox. Rubella therefore was the seventh vaccine to enter the EPI, followed two years later by viral hepatitis B. The EPI therefore then included monovalent measles and monovalent rubella vaccines. Although the combined MR (measles-rubella) and MMR (measles-mumps-rubella) were available, they were not introduced (until recently in 2002) on consideration of costs. With what was then known of the epidemiology of measles in the country, the monovalent measles vaccine was given at 9 months of age, and this was

Corresponding Author: Narimah Awin, Division of Family Health Development, Ministry of Health, Malaysia, Block E 10, Aras 7 & 8, Parcel E, Pusat Pentadbiran Kerajaan Persekutuan, 62590 Putrajaya

later found to be inadequate to prevent outbreaks, and justification to replace it by MMR became clear.

By 1987, newer knowledge on rubella vaccine has emerged, including from the experiences of UK and USA, and a more evidence-based approach could be adopted. Whilst, vaccine transmissibility was initially a concern, later it was established that it was safe to vaccinate non-pregnant women of child bearing age and children in households in which there were pregnant women, a wider option of target groups could be adopted.

In 2002, the Ministry of Health successfully justified the introduction of the vaccine against *Haemophilus influenza B* (Hib) disease into the EPI. This offered an opportunity to review the EPI, and along with the Hib vaccine, MMR was also introduced, to replace the monovalent measles and rubella vaccines. Thus, Malaysia began to add on the universal strategy for rubella (vaccinating young boys and girls) in 2002; it is therefore essentially a 2-stage approach that began with the selective strategy and has now become the combined strategy.

Clearly, getting a proven safe, effective and affordable vaccine incorporated into the EPI is only the first, perhaps a less challenging, part of the programme. The decision on selecting the strategy was also not a problem. What poses as a real challenge for programme managers and service providers is to ensure that the vaccine reaches the target population at the right time, so that the programme achieves what it set out to achieve. The traditional indicator for *effectiveness*, using coverage rate, tells only part of the story; the real *impact* can only be assessed by reduction or elimination of the target disease. The article by Sekawi et al highlights this issue[2]. The Malaysian programme clearly has "done well' in terms of effectiveness, with very high coverage rates, but the impact appears to be less than desired, with cases of CRS still being encountered. The article highlights two seemingly contradictory situations – continued occurrence of CRS in the presence of a high proportion of immune women, who received immunity either through vaccine or natural infection. In this context, some facts are relevant.

- The combined strategy incorporating younger children was introduced only in 2002, and the direct impact of immunization conferring immunity to the vaccines is not likely to be seen yet;
- The concept of herd immunity, which requires a certain level of immune population or herd immunity for the indirect impact of immunization to be derived, has not been fully explored. With the selective strategy adopted in the first phase, younger children who were not the target group remained as potential sources of infection, herd immunity was expectedly low, and infection began to shift to older age, leading to higher chance of a pregnant woman being infected.
- As the writers appropriately cautioned, this study, conducted among ante-natal women in only one hospital, does not take into account the other localities where the pattern of immune levels and CRS incidence and their association remain a conjecture[2].

One challenge is in surveillance, monitoring and measuring impact. Since rubella/CRS are not notifiable conditions, these activities can only depend on studies, especially seroepidemiological surveys and specific studies such as the one reported in this issue, and will remain as important activities to the national immunization programme. It is also extremely difficult to calculate coverage rates as done for the other EPI vaccines, since the target group is not a well-defined single group, and it is almost impossible, to derive the appropriate denominator.

It is very encouraging that in 2004, the third year of MMR implementation, 80% coverage was achieved[3]. It is also noteworthy that the EPI continues to give rubella vaccine to older children and women of child bearing age. While success has become apparent in terms of coverage rate, both of rubella and of MMR, there is the challenge to sustain this coverage, and to ensure that the objective of eliminating CRS is achieved. What the article by Sekawi et al highlights is how important it is to recognise that CRS will continue to occur unless the most effective strategy is adopted. The combined strategy since 2002 with the MMR vaccine given to young children (replacing the monovalent measles and rubella vaccines) through the most appropriate and optimum schedule, and the monovalent rubella vaccine offered to susceptible older persons, gives hope and promise to the elimination of CRS in this country.

References

1. Narimah A. Towards a national control programme in Malaysia. Ministry of Health Malaysia, 1984.
2. Sekawi Z, Muizatul WMN, Marlyn M, Jamil MAY, Ilina I. Rubella vaccination programme in Malaysia: Analysis of a seroprevalence study in an antenatal clinic. Med J Malaysia 2005; 60: 346-49.
3. HMIS Reports: Family Health Development Programme, 2003. Ministry of Health Malaysia, 2004.