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Strengthening national immunization systems through measles and rubella elimination and prevention of congenital rubella infection in WHO's European Region

Immunization is a proven and highly effective intervention utilized to control and sometimes eliminate communicable diseases. Measles, rubella and congenital rubella infection remain important causes of vaccine-preventable disease among children and adolescents in the Region. Measles and rubella have been eliminated in a number of countries through strong, routine two-dose combined measles and rubella vaccine programmes for children, elimination meaning the interruption of endemic disease through high levels of population immunity achieved by sustainable, high-quality immunization services.

This report provides background information on immunization and on the current progress being made towards eliminating measles and rubella and preventing congenital rubella infection in the Region, and it outlines a strategy to achieve these objectives by 2010.

A draft resolution is attached for consideration by the Regional Committee.

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Background on immunization

1. Immunization is a proven and highly effective intervention utilized to control and sometimes eliminate communicable diseases, resulting in improved population health, particularly among children and adolescents. Vaccines administered within the WHO European Region have been targeted at diseases that cause significant morbidity and mortality.

- Smallpox was eradicated in 1980 thanks to global efforts; the last smallpox case in the Region occurred in 1978.
- More than 50 000 cases of diphtheria occurred in the Region in 1995 but, through the use of vaccines, the figure had fallen to 870 in 2002.
- In the 1950s, 28 000 cases of poliomyelitis occurred annually in the Region, but on 21 June 2002, the Region was certified poliomyelitis-free.

2. While effective childhood immunization programmes have been an integral part of public health services in the Region for decades, ongoing political commitment is required to maintain and improve the existing immunization infrastructure. Strong immunization systems include equitable distribution of immunization services; high immunization coverage rates for currently used vaccines; use of high quality vaccines given in a safe manner; robust surveillance for vaccine-preventable diseases, including the essential laboratory networks to confirm disease and support outbreak investigations; and the introduction of new vaccines to prevent additional disease burden and further improve health. Immunization systems should have the capacity to incorporate new vaccines when supported by high-quality evidence. Such vaccines could include those that protect against infections with rotavirus (childhood diarrhoea), human papillomavirus (cervical cancer), groups A and C meningococci (meningitis), varicella (chickenpox) and pneumococci (pneumonia and meningitis).

3. Vaccine coverage rates have declined in some Member States as a result of various factors:

- public, policy-maker and health-professional perception that the risk of disease is low;
- misperceptions by health professionals and the public of the benefits compared to the risks of immunization;
- limited access to health care facilities or sustained outreach services;
- limited financial resources at national or individual level;
- religious or other beliefs held by parents or caregivers and a lack of targeted efforts to reach such people;
- media reports challenging accepted data on efficacy and safety of vaccines.

4. Some Member States have developed initiatives to address barriers to immunization. Health care workers have overcome factors related to access (cultural, linguistic and physical) and improved delivery of immunization services to vulnerable and high-risk groups such as the Roma community (1). Other countries have developed risk communication strategies to counter claims against vaccines including the alleged link between the measles-mumps-rubella (MMR) vaccine and autism.

5. WHO has been working with Member States to improve the availability of information on the benefits and risks of immunization through the Vaccine Safety Net (VSN), linking websites that meet good information practice standards; there are currently 13 websites in the Region, providing information in 7 languages (2).

6. A regional immunization week is being piloted in 2005 by WHO in at least eight Member States to improve awareness of immunization. Member States may utilize the opportunity to promote safe immunization practices; provide information to health care providers and parents; advocate immunization within their communities; and improve vaccine coverage among vulnerable populations.

Existing commitments

7. The United Nations Member States resolved in Millennium Development Goal 4 to “reduce by two thirds, between 1990 and 2015, the under-five mortality rate”. The proportion of one-year old children immunized against measles is an indicator for Goal 4.

8. World Health Assembly resolution WHA56.21 on the strategy for child and adolescent health and development urged Member States to strive for full coverage of their maternal, neonatal, child and adolescent populations with interventions known to be effective, advocating the use of a public health approach, such as immunization, to reduce the incidence of common diseases.

9. World Health Assembly resolution WHA56.20 on reducing global measles mortality urged nations to implement the WHO-UNICEF strategic plan for measles mortality reduction 2001–2005 in countries with high measles mortality within existing national immunization programmes, in efforts to reduce from 800 000 the number of measles-related deaths occurring globally every year. The Health Assembly also recommended that nations use the strategic approach of reducing global measles mortality as a tool for strengthening national immunization programmes.

10. World Health Assembly resolution WHA58.15 on the draft global immunization strategy urged Member States to meet immunization targets expressed in the United Nations General Assembly special session on children; to adopt the Global Immunization Vision and Strategy as the framework for strengthening national immunization programmes between 2006 and 2015, with the goal of achieving greater coverage and equity in access to immunization, of improving access to existing and future vaccines, and of extending the benefits of vaccination linked with other health interventions to age groups beyond infancy; and to ensure that immunization remains a priority on the national health agenda and is supported by systematic planning, implementation, monitoring and evaluation processes, and long-term financial commitment.

11. In its resolution EUR/RC48/R5 the Regional Committee approved the Health for All policy framework for the European Region for the 21st century, which identified targets for nine vaccine-preventable diseases, including the elimination of measles (interruption of indigenous measles transmission) by 2007 and a reduction of the incidence of congenital rubella to below 0.01 per 1000 live births by 2010.

12. Resolution EUR/RC52/R2 on the certification of the European Region of WHO as a territory free from indigenous wild poliovirus requested Member States to continue their efforts to sustain “polio-free” status until global certification, particularly with regard to sustaining a high level of routine immunization coverage, implementing supplementary immunization activities where necessary, maintaining surveillance of acute flaccid paralysis and polioviruses and making progress in the process for laboratory containment of wild poliovirus.

Measles and rubella immunization

Immunization policies

13. The European Region, the Western Pacific Region, the Eastern Mediterranean Region and the Region of the Americas of WHO all have the objective of measles elimination; the Pan-American Health Organization (PAHO) declared that this had been achieved in the Region of the Americas in 2002. In 2002, a strategic plan for measles and congenital rubella infection in the European Region of WHO was developed through a regional consultation process and implemented; the measles and congenital rubella objectives were linked to a 2010 target date (3). The plan is designed to strengthen routine immunization programmes as a means of attaining the objectives, and it outlines six key strategies:

- to achieve and sustain very high coverage with two doses of measles vaccine through high-quality routine immunization services;
- to provide a second opportunity for measles immunization through supplementary immunization activities to populations susceptible to measles, consistent with national targets for measles control;
- to use the opportunity provided by supplementary measles immunization activities to target populations susceptible to rubella;
- to ensure protection to women of childbearing age by achieving high coverage with rubella vaccine;
- to strengthen surveillance systems by vigorous case investigation and laboratory confirmation; and
- to improve the availability of high-quality, valued information for health professionals and the public on the benefits and risks associated with immunization against measles and rubella.

Progress towards meeting the targets

14. Finland was the first country in the world to document the elimination of measles, mumps and rubella through the use of a routine two-dose MMR schedule (4). Now, all Member States in the European Region have routine two-dose measles vaccination schedules and 48 (92%) use rubella vaccine; 47 use a combined measles-rubella vaccine. In 2001, 76% of countries were using rubella vaccine. Coverage rates for the first dose of measles vaccine averaged 90% in 2003, with national rates ranging from 78% to 99%. Since 1994, national supplementary immunization activities (SIA) targeting people susceptible to measles and/or rubella have taken place in at least 11 Member States (5), and subnational SIA have been organized in others.

15. The number of Member States reporting a measles incidence of less than one per million population (one criterion for measles elimination) has increased from 13 in 2001 to 27 (52%) in 2004. The number of measles cases reported has also declined by 92% over the last decade, but more than 27 000 cases were still reported in 2004. Measles outbreaks have occurred during the last four years in at least 13 Member States in western, central and eastern parts of the Region. Almost 50% of imported measles cases within the European Union (EU) are from other EU countries. The Region is also an important exporter of measles to the Region of the Americas; 37% of all measles cases imported into the United States between 1993 and 2001 (6) and 21% of all Canadian measles cases between 1999 and 2001 (7) were linked to the European Region.

16. Rubella surveillance in the Region is varied, with some Member States, which introduced rubella vaccine only recently, unable to provide laboratory confirmation of most cases until the incidence decreases, because of the cost of testing; six Member States do not currently have national surveillance. Surveillance for congenital rubella syndrome (CRS) is also weak; seven Member States, representing 25% of the Region's population, do not have national CRS surveillance. Strengthening CRS and congenital rubella infection (CRI) surveillance has been a recommendation from four formal WHO consultations in 2004 and 2005.

17. Building a laboratory network for measles and rubella surveillance has been a key activity in the Region. The existing network for poliomyelitis surveillance formed a framework for the development of 47 national measles and rubella laboratories and three regional reference laboratories. Ongoing support from Member States for surveillance activities is essential for the rapid detection and confirmation of measles and rubella cases.

18. The strategic plan for measles and congenital rubella infection in the WHO European Region was reviewed during the meeting of programme managers for vaccine-preventable diseases and immunization in October 2004 and by the WHO European Technical Advisory Group of Experts on Immunization in November 2004. Both groups endorsed the existing objectives and key strategies and

recommended that a target for rubella elimination be added to the plan. Given that Member States are moving quickly toward the use of combined measles-rubella vaccines and that rubella is between three and four times less contagious than measles, rubella elimination is feasible within the framework of a measles elimination strategy.

Economic benefits of vaccination

19. Immunization against measles and rubella viruses can occur through the use of either single antigen vaccines (i.e. only measles or only rubella) or combined measles and rubella vaccines. Economic studies focusing on nations in the European Region have confirmed cost-effectiveness when measles vaccination coverage rates are improved, both in the case of low previous coverage rates (70% or lower) and where previous coverage rates were 90% (8). Furthermore, studies establish benefit-to-cost ratios of more than 2.5 for two doses at 95% coverage rates. A global review of 17 studies, including 7 studies from the Region, found that rubella vaccine was a cost-effective and cost-saving (benefit-cost ratio >3) intervention (9). Economic evaluations from Canada and the United States also support the routine two-dose MMR schedule recommended by studies from western Europe.

20. Italy experienced a measles outbreak in 2002 and 2003, with over 40 000 measles cases, 16 cases of measles encephalitis and 4 deaths. A recently published analysis of costs associated with the outbreak in 2002 estimated the direct costs to have been between €9.9 million and €12.4 million and the total costs to have been €14.8 million, sufficient to have vaccinated 2.7 birth cohorts of children nationally with two-doses of MMR at 95% coverage rates (10).

Next steps

21. The Regional Committee is requested to agree with and commit itself to the targets of measles and rubella elimination and congenital rubella infection prevention by 2010, acting on previous international commitments to protect children and adolescents from vaccine-preventable diseases through strong, routine, sustainable immunization services.

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