



Measles and Rubella Global Strategic Plan 2012–2020 midterm review report: Background and summary [☆]



Walter A. Orenstein ^{a,*}, Lisa Cairns ^b, Alan Hinman ^c, Benjamin Nkowane ^d, Jean-Marc Olivé ^e, Arthur L. Reingold ^f

^a Emory Vaccine Center, Emory University School of Medicine, Emory University, 1462 Clifton Road NE, Suite 446, Atlanta, GA 30322, USA

^b 2650 Bowker Avenue, Victoria, Canada

^c Center for Vaccine Equity, The Task Force for Global Health, 325 Swanton Way, Decatur, GA 30030, USA

^d 40 chemin des Pralies, 1279 Bossey, Switzerland

^e Wellenau 11, 6900 Lochau, Austria

^f 101 Haviland Hall, School of Public Health, University of California, Berkeley, CA 94720, USA

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ABSTRACT

Measles, a vaccine-preventable illness, is one of the most infectious diseases known to man. In 2015, an estimated 134,200 measles deaths occurred globally. Rubella, also vaccine-preventable, is a concern because infection during pregnancy can result in congenital defects in the baby. More than 100,000 babies with congenital rubella syndrome were estimated to have been born globally in 2010. Eradication of both measles and rubella is considered to be feasible, beneficial, and more cost-effective than high-level control. All six World Health Organization (WHO) regions have measles elimination goals by 2020 and two have rubella elimination goals by that year. However, the World Health Assembly has not endorsed a global eradication goal for either disease. In 2012, the Measles and Rubella Initiative published a *Global Measles and Rubella Strategic Plan, 2012–2020*, referred to hereafter as the *Plan*, which aimed to achieve measles and rubella elimination in at least five WHO regions by end-2020 through the implementation of five core strategies, with progress evaluated against 2015 milestones. When, by end-2015, none of these milestones had been met, WHO's Strategic Advisory Group of Experts on Immunization (SAGE) recommended a mid-term review of the *Plan* to evaluate progress toward goals, assess the quality of strategy implementation, and formulate lessons learned. A five-member team reviewed documents and conducted interviews with stakeholders as the basis for the review's conclusions and recommendations. This team concluded that, although significant progress in measles elimination had been made, progress had slowed. It recommended that countries continue to work toward elimination goals with a focus on strengthening ongoing immunization systems. In addition, it concluded that the strategies articulated in the *Plan* were sound, however full implementation had been impeded by inadequate country ownership and global political will, reflected in inadequate resources. Detailed recommendations for each of the *Plan*'s five strategies as well as the areas of polio transition, governance and resource mobilization are outlined.

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1. Background

1.1. General considerations

In 2016, a midterm review of the Measles and Rubella Initiative's (M&RI's)¹ *Global Measles and Rubella Strategic Plan, 2012–2020* ('the *Plan*') was undertaken at the request of the World Health Organization's (WHO's) Strategic Advisory Group of Experts on Immunization (SAGE). The purpose of this article is to summarize

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* Corresponding author.

E-mail addresses: worenst@emory.edu (W.A. Orenstein), karenlisacairns@gmail.com (L. Cairns), ahinman@taskforce.org (A. Hinman), drnkowa@gmail.com (B. Nkowane), jmjlive@gmail.com (J.-M. Olivé), reingold@berkeley.edu (A.L. Reingold).

¹ The M&RI is a consortium led by WHO, the United Nations Children's Fund, the United States Centers for Disease Control and Prevention, the United Nations Foundation, and the American Red Cross.

the major findings and recommendations of that review, the report of which is published in toto in (Vaccine, Volume 35, Supplement 3). As the audience for this article may encompass those with an interest in overall health delivery systems and not solely measles and rubella experts, basic information on measles and rubella and their control is included here.

Measles, a viral illness, is one of the most highly infectious diseases known to man. Complications of measles include pneumonia, diarrhea and encephalitis. Case fatality ratios from measles vary from 0.1% in the developed world to 15% in the less developed world [1]. Population immunity of 92–95% is considered necessary to interrupt measles transmission [2]. Although a highly-effective measles vaccine has existed since 1963, in 2015, an estimated 134,200 measles deaths occurred globally [3]. This burden is unevenly distributed across WHO regions, within regions, and even within countries. Due to its highly infectious nature, measles effectively seeks out unvaccinated individuals and is often considered to be the indicator disease or the ‘canary in the coal mine’, able to identify individuals and subpopulations who remain unreached by immunization programs. Measles vaccination coverage serves as an indicator of the quality of immunization programs [4], while the epidemiology of measles cases highlights specific geographic areas and populations in which immunization services require further strengthening. Although measles is often perceived as a childhood disease, the introduction of measles vaccine with partial disease control has allowed unimmunized individuals in many countries to remain unexposed to measles virus into adulthood and thus still be susceptible to infection, resulting in a much wider age distribution of measles cases than had historically been the case [1].

Rubella, another vaccine-preventable viral disease, is primarily a concern because infection during pregnancy can result in fetal death or severe congenital defects, including heart defects, cataracts, deafness, and cleft palate, in the baby. Rubella is one of the few known causes of autism [5]. In 2010, more than 100,000 babies with congenital rubella syndrome (CRS) were estimated to be born globally. As is the case with measles, the burden of disease is unevenly distributed across WHO regions [6].

The concept of measles eradication has been reviewed by the International Task Force for Disease Eradication (ITFDE), as well as by an independent group of experts and the SAGE, resulting in the affirmation of the feasibility and desirability of eventual eradication of measles. The ITFDE also reviewed progress towards rubella eradication, concluding that this was technically feasible and that the economic literature demonstrated that eradication of both measles and rubella was more cost-effective than indefinite high level control of either of these diseases [7–10]. All WHO regions now have measles elimination goals, while two have rubella elimination goals. The *Global Vaccine Action Plan* (GVAP), the implementation plan for the Decade of Vaccines, has targets to achieve measles elimination in four WHO regions and rubella elimination in two WHO regions by 2015, and to achieve measles and rubella elimination in five WHO regions by 2020 [11]. Nonetheless, at present no global measles or rubella eradication goal has been endorsed by the World Health Assembly.

Measles-containing vaccines (MCV) are currently part of the schedule of childhood vaccinations in all countries. The most comprehensive approach to preventing both rubella and CRS includes use of rubella-containing vaccine (RCV) in childhood immunization schedules as well as targeting rubella-susceptible older age groups for vaccination [12]. A recent focus on CRS prevention has led to an acceleration of the introduction of RCV into childhood vaccination schedules globally. Measles and rubella vaccines are routinely administered subcutaneously as combined measles rubella vaccine (MR) or measles, mumps and rubella vaccine (MMR). The very high levels of population immunity needed to assure interruption of

measles transmission require delivery of two doses of MCV [2]. At present, supplementary immunization activities (SIAs) (mass immunization campaigns) against measles targeting all persons in a given age group regardless of prior vaccination status are an integral part of national immunization program activities in many countries. Current WHO policy is that “Reaching all children with 2 doses of measles vaccine should be the standard for all national immunization programs. . . In addition to the first routine dose of MCV (MCV1), all countries should include a second routine dose of MCV (MCV2) in their national vaccination schedules regardless of the level of MCV1 coverage. . . Countries conducting regular campaigns to achieve high population immunity should consider cessation of campaigns only when >90–95% vaccination coverage has been achieved at the national level for both MCV1 and MCV2, as determined by accurate coverage data for a period of at least 3 consecutive years.” [13] In theory, target age groups for SIAs are selected based upon the age distribution of susceptibility to measles in the population, however, in practice the availability of resources is also taken into consideration. The frequency with which SIAs must be conducted to maintain herd immunity depends upon the population immunity existing in the targeted population [13].

Surveillance data are critical to guiding measles and rubella control and eradication efforts. Surveillance enables the establishment of burden of disease and mortality, and thus plays an important role in advocacy for and prioritization of activities targeting measles and rubella. Measles cases detected by surveillance identify un- or under-vaccinated populations, highlighting geographic areas or sub-populations in which vaccination programs overall – not only those targeting measles and rubella – require further support. Surveillance measures disease incidence, the best outcome indicator of disease control and eradication programs. Well-done outbreak investigations are an important aspect of surveillance, allowing understanding of who is transmitting disease to whom, information which is critical to formulating effective vaccination strategy. Well-done outbreak investigations can also provide information to be used for economic analyses of the societal impact of measles or rubella. WHO provides guidance to countries on measles and rubella surveillance, and has developed indicators to monitor the quality of these activities [14,15].

Surveillance and outbreak investigations are underpinned by the diagnostic services of the Global Measles and Rubella Laboratory Network (GMRLN). This network of 723 labs provides confirmation of suspected measles and rubella cases by serologic testing to measure IgM antibody or significant rises in antibody and molecular methods to detect virus, as well as providing information on global genotype distribution and evidence of interruption of transmission of endemic genotypes. Historically, disease confirmation was based upon serological testing. However, new diagnostic methods based, for example, on dried blood spots or oral fluid have been developed and may be better adapted for use in certain settings than serology. Dried blood spots on filter paper offer the added advantage of not having to use a reverse cold chain for transporting clinical specimens to the laboratory. The same holds true for oral fluid (gingival crevicular fluid) which can be collected through non-invasive techniques. Both sample types can be used for either IgM antibody detection or molecular analysis [16].

National governments have the primary responsibility for management and governance of their national immunization programs. Interagency Coordinating Committees also play a central role in ensuring strong governance of immunization programs in countries that rely on external partner support. At national and regional levels, important roles are played by National Verification Committees (NVCs) and Regional Verification Commissions (RVCs) for elimination of measles and rubella. As yet, no global verification committee has been established. The M&RI and Gavi, the Vaccine

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