

## Covid-19 Pandemic - Greater Emphasis on Measles and Rubella Vaccination is Needed

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### Abstract

WHO along with other global partners pledged to eradicate Measles and control Congenital Rubella Syndrome by 2020. COVID-19 caught the world unaware, affecting significantly the delivery of healthcare including the childhood vaccination programme in resource deprived countries.

Intensified Mission Indradhanush 3.0 has been launched by Indian Government to tackle missed dosing of Measles Rubella vaccination, so that the immunisation programme can be strengthened and re-energised. Recent data reported by WHO indicates that India has the second highest number of cases of Measles from August 2020 to January 2021. Thus, COVID-19 is increasing the risk of Measles outbreaks. Measles will prove to be an indiscernible infection resulting from COVID-19 pandemic which is many times more infectious than COVID-19 itself.

**Keywords:** Measles; Rubella; Morbidity; Mortality; COVID-19

### Abbreviations

WHO: World Health Organisation; COVID-19: Coronavirus Disease; RCV: Rubella Containing Virus

### Background

Measles infection is a major vaccine preventable cause of death in under-five year olds [1]. Rubella infection in pregnant women may cause fetal death, multiple congenital defects including deaf blindness and is also a vaccine-preventable illness.

The Measles and Rubella Initiative was born in 2001. WHO along with other global partners pledged to eradicate Measles and control Congenital Rubella Syndrome by 2020. In India, a phased nationwide supplementary immunisation activity using Measles Rubella vaccine targeting children aged 9 months to 14 years commenced in 2017. Recent report indicates that worldwide Measles deaths rose 50% from 2016 to 2019. Measles caused over 207, 500

deaths in 2019 [2]. The emergence of COVID-19 pandemic in March 2020 has proved to be a major challenge and distraction for health care providers in tackling all aspects of healthcare for children including the Measles and Rubella Initiative. Recent data reported by WHO in March 2021 indicates that India stands with second highest number of cases of Measles with data collected from August 2020 to January 2021 [3]. Thus, COVID-19 is increasing the risk of Measles outbreak in unimmunised and partially immunised children. Measles and Rubella Strategic Framework 2021 - 2030, will help to address setbacks in worldwide progress that was made toward measles elimination [4].

### Complications of measles and rubella infection

The measles virus is a single-stranded RNA virus of the genus Morbillivirus. Measles is a highly contagious viral illness characterized by fever, rash, malaise, coryza, cough and conjunctivitis. Measles has been targeted for eradication, as humans are its only reser-

voir. Basic reproduction number of Measles virus is 12 - 18, which means that each person with measles would, on average, infect 12 - 18 other people in a totally susceptible population [5]. Measles virus has one of the highest basic reproduction number among all the viruses against which vaccines are available. The Measles virus is transmitted by airborne droplets when infected people sneeze or cough. One vaccination dose is about 93% effective and two doses are about 97% effective in preventing Measles.

Measles occurs worldwide and remains to be a leading cause of mortality especially among children less than 5 years of age. Under reporting and varied surveillance systems make it difficult to obtain its precise worldwide incidence. Children younger than 5 years age are more likely to suffer from complications which are mainly otitis media, pneumonia, diarrhoea, post-infectious encephalitis (1 per 1000 to 2000 cases), and subacute sclerosing panencephalitis affects 1 per 100,000 cases. Pneumonia accounts for six out of ten measles associated deaths [6]. It is well known that Vitamin A supplementation prevents morbidity and mortality in children under the age of 5.

Before the introduction of the measles vaccine in 1960's, over two million deaths occurred annually. Availability of measles vaccination, immediately impacted disease incidence, reduced associated mortality rates, and altered global distribution. Measles occurs predominantly in resource-limited settings with low vaccination rates due to its high basic reproduction number. Vaccine hesitancy is the main cause of outbreaks in resource-rich settings.

Rubella virus is a single-stranded RNA virus of the genus Rubivirus. Rubella is a common cause of febrile illness with rash among children. Rubella is an acute, contagious viral infection. While Rubella virus infection usually causes mild fever and rash in children and adults, infection during pregnancy, especially during the first trimester, can result in miscarriage, fetal death, stillbirth, or infants with congenital malformations, known as Congenital Rubella Syndrome. Rubella has been targeted for eradication, as humans are its only reservoir. Basic reproduction number of Rubella virus is 5 - 7, which means that each person with rubella would, on average, infect 5 - 7 other people in a totally susceptible population. The Rubella virus is transmitted by airborne droplets when infected people sneeze or cough [7]. At least 95% of those vaccinated 12 months or older develop serologic evidence of Rubella immunity after a single dose, and more than 90% have protection against it

for a minimum of 15 years. In countries, where Rubella infection is endemic, Congenital Rubella Syndrome is an important cause of severe birth defects. It has been estimated that during 1996 - 2010, globally 105,000 infants with Congenital Rubella Syndrome were born every year, 38% of which were from India [8].

### Current burden of measles and rubella infection

In October 2019, Iran received certification for Measles elimination. Iran, has a population of approximately 82 million. This is the third country in the Eastern Mediterranean region that has achieved the status of Measles elimination, after Oman and Bahrain, both of which have relatively small populations. Sri Lanka, a small country with low population was also declared Measles free in 2019. However, without sustained effort made for this success, the certification can be withdrawn. The challenge for Iran and the other countries mentioned above is to maintain the interruption of Measles transmission by sustaining high immunization rates. In 2018 and 2019, several countries in Europe and America region lost their Measles elimination status. Notably, Iran also received certification for Rubella elimination in May, 2019 [9]. In the 1990s, India's national vaccination program made one dose of the Measles vaccine part of routine vaccinations through much of the country to help reduce the numbers of Measles deaths. However, it was one of the last countries to add a second dose of measles vaccine as recommended by the World Health Organization, which has been shown to prevent infection and death in 90-95% of vaccinated children. In 2005, fewer than 45 percent of Indian babies received all their basic vaccinations. A decade later, thanks to improved immunization services across the country, that number had jumped to 62 percent. Estimates of Measles-related deaths is a vital indicator which evaluates progress any nation makes towards Measles elimination [10]. Measles remains an important cause of death among under-five children [11]. Much of this persisting global burden of measles is located in Africa and Asia, notably in India [12] and [13]. Direct estimation of cause-specific mortality documented a 90% decline in 1 - 59 month Measles mortality rates in India from 2000 to 2015 [14]. Recent report indicates that worldwide Measles deaths rose 50% from 2016 to 2019 [2].

Countries in the WHO regions of Southeast Asia and Africa which have been the slowest to add RCV vaccine to their national vaccination schedules, have the highest incidence of Congenital Rubella Syndrome suffering 84% of the estimated 105,000 global

incident Congenital Rubella Syndrome cases in 2010. India has the largest burden, with an estimated 40,000 cases [15]. Addition of Measles Rubella vaccination at age 15 years for all youngsters girls and boys will be another step forward towards control of Congenital Rubella Syndrome.

Recent data reported by WHO in March 2021 - indicated that India stands with second highest number of cases of Measles after Yemen with data collected from August 2020 to January 2021. COVID-19 is increasing the risk of Measles outbreak [16].

Missed dosing is not only a concern for India, but a global threat. It is projected that vaccine interruption triggered by COVID-19 pandemic is expected to cast a dark shadow on the immunisation services in the least developed countries.

### Challenges for vaccination of children

COVID-19 pandemic has disrupted vaccine administration due to people and personnel factors. People factors include parent or family member contracting COVID-19 needing treatment or contact with a family member with COVID-19 necessitating isolation, restriction of movement during initial phase of pandemic, people avoiding crowds and indoor visits, fear of being exposed to others with COVID-19, transport restrictions and interruptions, mass movement from urban to rural areas due to loss of livelihoods causing economic hardship. Low maternal education could be an added factor for challenges faced in vaccination of children. Personnel factors are staff being unavailable to attend work due to restriction on travel or redeployment to COVID-19 response duties, as well as lack of personal protective equipment, personnel contracting COVID-19 themselves needing treatment or contact with a family member or colleague necessitating isolation or quarantine.

Vaccinating an ever-growing population is a major challenge in itself. Approximately, 25 million children are born in India every year [17]. This is more than in any other country in the world. Without vaccination, each infant is susceptible to a host of life-threatening illnesses: polio, rubella, measles, pertussis, and diphtheria, among others. Mission Indradhanush was launched by the Ministry of Health and Family Welfare on 25<sup>th</sup> December 2014. The main aim was to expand immunization coverage to all children across India. Children across all socio-economic, cultural and geographical spectrum are being immunised under this program.

But that progress was threatened by the coronavirus in 2020. The pandemic response temporarily affected India's health care delivery system. This caused government and private health care providers to be overwhelmed. Many frontline health workers who once delivered routine immunisation services diverted their focus onto COVID-19 containment efforts. This diversion of resources deprived communities of essential services. This over the span of one year lead to a buildup of unimmunised or partially immunised children. This critical situation is highly likely to trigger outbreaks of vaccine-preventable diseases. Some of the vaccine preventable illnesses can cause greater harm than COVID-19 itself with Measles being about 5 times infectious than COVID-19.

During the first wave of COVID-19 pandemic, states had adopted varying approaches toward immunisation. While some maintained fixed sites and institutions to deliver vaccinations, others temporarily put their services on hold. Missed dosing is not only a concern for India, but a global threat. Vaccine interruption triggered by COVID-19 pandemic is expected to have a far-reaching impact on immunisation services in developing countries like India.

Article 24 of United Nations Convention on Rights of a Child indicates that every child should have the right for best possible health. Abiding to this Article, Government of India has tried to ramp up immunisation. This is being done by implementation of Intensified Mission Indradhanush 3.0. This was rolled out in February 2021. Its aim is to strengthen and re-energize the immunisation programme by immunising children and pregnant women who missed their routine vaccination during the first wave of COVID-19 pandemic and afterwards. With the onset of the catastrophic second wave of pandemic, with COVID-19 infections rising daily on a huge basis in comparison to September 2020, Intensified Mission Indradhanush 3.0 immunization service delivery should not stall. It is a difficult task to assess/quantify the challenges in vaccination during these extraordinary times. With the danger of vaccine-preventable disease outbreaks looming large, public and independent health systems need to quickly adopt a middle path to continue basic immunisation services. This will help the much needed protection for Indian children. Meeting the target of 90% coverage set out by Intensified Mission Indradhanush 3.0 will be an arduous task, but nevertheless a great achievement. Time will indicate its success. Considering the basic reproduction number of COVID-19 being 1.8 to 3.6 which is less than that of Measles and

Rubella, and with complication of Measles raising mortality of under five year olds, spread of Measles should be inhibited by continuing vaccination of children with appropriate safety precautions taken by health personnel. This will help prevent serious outbreaks of Measles and Rubella. It is our duty to not let children suffer on account of the current COVID-19 pandemic.

## Conclusion

It is known medical knowledge that children are at low risk of severe COVID-19 disease and death. However, they are being exposed to disproportionate risk from contracting vaccine preventable illnesses like Measles and Rubella due to non or partial immunisation. Meticulous use of safety measures, determination and intricate planning along with strong resolve is required so that great advantages obtained through immunisation during pre-pandemic period and furthermore targets set out by Intensified Mission Indradhanush 3.0 can be achieved. This can only happen with great will and goal chasing by the Government.

Primary care givers and medical personnel should use appropriate personal protective equipment and sanitization measures. This will protect themselves and the families they see for immunization. This will furthermore help increase confidence in parents and their caregivers to attend immunisation clinics and will help prevent outbreaks and thus indirectly decrease mortality of under five year olds and also decrease morbidity and mortality due to Congenital Rubella Syndrome and its associated long term disabilities like deaf blindness. India has to perform better to show the world that it is acting for its children who are the rightful citizens of tomorrow by providing them with their basic Rights of a Child.

## Conflict of Interest

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