Confronting Rubella

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GOAL: TO REDUCE CHILD MORTALITY, MORBIDITY AND DISABILITY ASSOCIATED WITH VACCINE PREVENTABLE DISEASES.

" Mission statement of the National Immunization Programme run by the Ministry of Health and Population, Government of Nepal"
Nepal has demonstrated that where there is a will, there is indeed a way.

Devastated by the terrible earthquake of April 2015, Nepal has nevertheless pursued the goal set by the Sixty-sixth session of the Regional Committee in 2013 – to control rubella and congenital rubella syndrome – with tenacious resolve. So much so that it has achieved these outcomes two years ahead of the deadline.

The commencement of case-based rubella surveillance, mandatory reporting and the introduction of the rubella vaccination in 2013, coupled with the introduction of the second dose of the rubella vaccination in 2015, led to a dramatic decline in rubella cases, from well over a thousand in 2009 to a handful in 2017.

These achievements were made via the Ministry of Health’s leadership and strategic acumen, alongside cooperation between government and development partners and the efforts of countless health workers and officials at the grassroots.

Nepal has led the Region in its efforts to deliver primary health care to all its people, achieving high immunization coverage, not only for measles and rubella, but for all vaccine-preventable diseases. The country’s goal of achieving 100% fully immunized districts, powered by the strength of local institutions, will drive many successes related to the control or elimination of vaccine-preventable diseases.

WHO looks forward to continuing to work with Nepal to this end to eliminating other vaccine-preventable diseases. I extend my warmest congratulations to the Government of Nepal for controlling rubella and congenital rubella syndrome well ahead of time.

Dr Poonam Khetrapal Singh
Regional Director
WHO South-East Asia Region
Full Immunization Declaration (FID) district (n=55)

All local bodies declared FID* (district yet to be declared) (n=2)

Some of the local bodies declared FID (n=20)

*As per current federalization structure, district structure is kept. However, two districts Nawalparasi and Rukum are divided. Nawalparasi district declared FID in Feb 2014, which is divided into Nawalparasi-E and Nawalparasi-W, not shaded on the map as FID district.
At first glance, infection with rubella virus doesn’t seem so threatening. The symptoms are usually mild, starting with a low-grade fever and a rash on the face and neck, which later extends to other parts of the body. The patient can also experience nausea, a mild form of conjunctivitis and swollen lymph glands, but generally these symptoms pass in a few days, and leave no lasting effect. And many people do not have any symptoms at all.

Why, then, the drive against rubella, if it is just a passing illness? The reason is powerful: if a pregnant woman is infected, the virus can infect the foetus with devastating results. This can lead to foetal death or severe birth defects through what is known as congenital rubella syndrome (CRS). A child with CRS will suffer a lifelong burden of disabilities, and may have a defective heart, sight impairment, hearing impairment, thyroid dysfunction or type 1 diabetes mellitus. Yet, had the mother been vaccinated in childhood, she would not have caught rubella and the child would have been born free of these congenital disabilities.

Rubella is an acute viral infection that is highly contagious. It spreads through airborne droplets when an infected person coughs or sneezes, generally affecting children and young adults. It is also transmitted through the placenta leading to devastating effects in the unborn fetus. Rubella was first identified in 1814 by George de Maton, but CRS was not recognized until the 1940s, when the ophthalmologist Norman Gregg linked congenital cataracts in Australia with intrauterine rubella infection.

This booklet tells the story of how Nepal has taken steps to ensure that its children are free from this scourge.
SIGNIFICANT EVENTS

2018
Verification that Nepal has adequately controlled rubella and CRS

2018
19 confirmed rubella cases

2015
Second dose of MRCV2 introduced in EPI; National Verification Committee formed; subnational-level SIA (MR vaccines) conducted (6–59 months)

2016
Subnational-level SIA (MR vaccines) conducted (9–59 months); National Public Health Laboratory last accredited

2013
MRCV1 (with rubella component) introduced in routine immunization (RI)

2012–2013
MR wide-age range campaign 9 months–15 years

2012
Full Immunization Declaration initiative introduced; MR campaign conducted (9 months–15 years)

2010
Mandatory reporting on measles and rubella started

2004
Outbreak surveillance started

1988
MCV1 introduced as part of its Expanded Programme on Immunization (EPI)

Source: Country report and WHO UNICEF estimates of national immunization coverage series
The government of Nepal has risen above all these challenges to ensure that its people are safeguarded and protected against rubella and CRS.
The task at hand was no easy one!

Nepal is a landlocked country with an extremely varied terrain - from the sparsely populated high mountainous region high in the Himalayas in the North, through the gradually undulating hill zone in the middle to the flat plains (terai) in the South, sharing with India, one of the most densely populated open borders in Asia.

Data from the Ministry of Health and Population, Department of Health Services, shows that of the 28.6 million people that make up the Nepalese population, some 18 000 live in difficult to access areas. However, about half (48%) of the population live in the Terai (in 23% of the country’s area) which is where the risk of communicable diseases including rubella is the highest. Nepal has an annual birth cohort larger than 600 000 and each birth cohort is immunized with all vaccines under the national immunization programme (NIP) free of cost.

As though the topography of the country was not challenge enough, a devastating earthquake in April 2015 left much of the infrastructure in tatters, with several hospitals either completely destroyed or else too badly damaged to function. Those that were able to function, were in urgent need of additional medical supplies. A timely mass campaign with measles rubella vaccine after the quake prevented any upsurge of measles or rubella cases, despite the massive population displacement.

In addition, Nepal has recently been in a period of political transition. An absolute monarchy until 2008, the country became a democratic state a mere decade ago and recently moved to a federal structure of government. The move from a centralized form of governance to a federalized one requires massive reorganization of infrastructure and systems.
Without commitment from the government, universal healthcare would remain just a dream. Fortunately for the people of Nepal, their government is committed to surmounting the many challenges that this small country faces, and to ultimately bring about universal health coverage for all its people.

The shift from central government to a federal state changes the paradigm of health service delivery, but that the health and wellbeing of its citizens is a priority for the Nepalese government is clear – Article 35 of the Constitution of Nepal, 2015 promises that “[e]very citizen shall have the right to free basic health services from the State, and no one shall be deprived of emergency health services.”

Putting this promise into action, the Immunization Act was signed into law on 26 January 2016 by the President of Nepal, and Nepal became the first country in the Region to convert its health goals into law. The country’s immunization programme was strengthened by this Act, which mandated immunization as the right of every Nepalese citizen.

LEADERSHIP

Target group shall have right to take vaccine: target group shall have right to take vaccines, included in immunization programme, free of costs.

— National Immunization Act 2015, Nepal
[Unofficial translation]
Local leadership and commitment – twin engines that drive Nepal’s immunization programmes

We selected a Village Development Committee (VDC) which is comparatively small, urban and where the health workforce was willing and energetic so that, we could achieve our target and which will be a lesson for learning to other VDCs as well.

— Immunization officer
District Nawalparasi
Devolution is at the heart of the Nepalese government, and while health initiatives originate from the centre, and have the support of the highest level of leadership, it is dynamic local leaders and engaged citizens who are responsible for taking the vision of the top leadership and turning it into reality. The gaunpalikas (rural municipalities) and nagarpalikas (urban municipalities) function efficiently, mobilizing and engaging their communities. They are instrumental in turning aspirations into programmes that work for, and benefit, all the people of Nepal – such as the move towards fully immunized districts.

"The stakeholders took their oath of making Achham a fully immunized district. At VDC level, we formed a team with stakeholders, collaborated with women’s groups, children’s groups and raised awareness on the importance of vaccination. Then we allocated wards among female community health volunteers, health workers and prepared lists of children up to 23 months with their vaccination status.

– Public health inspector
District Achham"

"We are planning to come up with activities at ward levels which will help in increasing the immunization coverage in Bardiya. We have already conducted orientation programmes for mothers’ groups in four VDCs because of which the drop out rate has decreased and our immunization coverage has increased. We will continue these kind of activities in the future as well.

– Gokarna Giri
EPI Supervisor, Bardiya"
Planning at the national level is never easy, requiring as it does multi-level strategies that encompass everything from the smallest community concern to nation-wide policies. When there is a challenging physical environment, with significant numbers of people living in remote and difficult to access areas, the complexity of the task is magnified. Added to this is the particular challenge brought about by the recent reorganization into federal provinces and urban and rural municipalities which would, naturally, pose some challenges to programme delivery.

Undaunted by these challenges, the government of Nepal is forging ahead with its health agenda. The National Health Policy of 2014 set out a broad framework of goals, with strategies to achieve them. The Nepal Health Sector Strategy (NHSS) for 2015 – 2020, formulated after the earthquake, has an aspirational goal – “improved health status of all people through accountable and equitable health service delivery system”. Detailed strategies have been put in place to achieve this goal, and an NHSS Implementation Plan (NHSS-IP) will translate the strategies into action.

In September 2016, the Comprehensive Multi-Year Plan (cMYP) 2017 – 2021 set out the National Immunization Programme of Nepal’s immediate goals – to be able to declare Nepal a fully immunized country by immunizing every child. A plan that has strong support of the leadership, a goal that has been endorsed at the highest level. To fulfill this, an immunization fund has been established.

To ensure that the national level plans are implemented at the grass roots, one needs to support micro-planning at local levels. Good micro-planning is key to deliver right services at right time at the right place. It also increases community participation as parents are aware of the next immunization session in their locality. A district immunization map clearly identifies the days of the month when the outreach immunization session would be held in the village. An example from Jajarkot district is shown on page 11.

Sustainable immunization plans are in place at the local government level.
During our time we did not have gyan (knowledge) about the importance of khop (vaccine). We were uneducated. Situation has changed. Now-a-days, every mother is concerned about her children and knows specific days of vaccination. Friends and relatives, radio and television inform them about national immunization day. They go to health facilities and immunize their children.

– 85-year-old grandmother in Sankhuwasabha
Immunization session planning
Jajarkot district

FCHVs are in each ward, so there is no difficulty in getting our children vaccinated. We got the information regarding vaccination from them.

— A mother having a child less than two years, Sankhuwasabha
Until 2017, health care in Nepal was delivered through five regional health directorates and six central hospitals. With each district having its own hospital, there are 75 fully equipped and functional district hospitals and 202 healthcare centres, as well as 3805 health posts and some 2908 outreach clinics. The country has two laboratories where measles and rubella are tested, one of which is accredited by WHO; accreditation is in process for the second.

In 2017, the administrative units were realigned: now the country has seven provinces and 753 local bodies, and two districts have been re-organized taking the number to 77. The NHSS restructuring plan too was realigned to reflect these changes.

Nonetheless, Nepal has been able to maintain smooth functioning of its programme, with changes of such magnitude it is likely to be some time before there is clarity as to the shape of the new healthcare delivery infrastructure, but one thing is clear – the government of Nepal has ambitious plans to put an excellent healthcare delivery system in place.
The earthquake that struck Nepal on 25 April 2015 left 8702 people dead and several thousand more injured, some seriously. Four hundred and forty-six public health facilities were completely destroyed, as were 16 private facilities while 765 other health facilities were partially damaged. As well as the toll it took in the form of human lives, the earthquake destroyed or damaged some 43% of the healthcare facilities in the country.

Despite such a large-scale tragedy, the country, like the phoenix, was able to revitalize itself. The Ministry of Health and Population drew up ambitious plans to modernize and reorganize the infrastructure to replace what was lost, using modern engineering technology to construct physical infrastructure that is more economical and practical to run, and which is more disaster resilient than what was lost in the earthquake.
Broad partnerships are the key to solving broad challenges. When governments, the United Nations, businesses, philanthropies and civil society work hand-in-hand, we can achieve great things.

– Ban Ki-Moon
former Secretary-General of the United Nations

As Nepal moves towards federalization WHO looks forward to continuing to work with the Government of Nepal and other healthcare partners, albeit in a changed country context. Our Country Cooperation Strategy, finalized in February 2018, is the third such programme, and acts as a road map for the collaborative work between WHO and the Nepalese government.

– Dr Jos Vandelaer
WHO Country Representative
Strategic partnerships are of great value to the government of Nepal in the delivery of a successful health system. In Nepal, partnerships run at three distinct levels. International organizations act as a valuable source of knowledge and expertise, and are able to assist the government to ensure that its health programme is aligned with global developments; partnering with local communities ensures ownership and buy-in as intended beneficiaries of a programme actively engage with it instead of being mere recipients; and intra-government partnership between different departments ensure seamless programme delivery. Indeed, no branch of the executive would be able to function efficiently, if at all, without a unified vision and coordinated action.

The Nepalese government’s close collaboration with the World Health Organization (WHO) Immunization Preventable Disease (IPD) Unit to eliminate measles and control rubella is one of its highly valued partnerships in the health arena. In addition to WHO, the National Immunization Programme, which aims to immunize every child in Nepal, is also supported by UNICEF and by Gavi, the Vaccine Alliance and other development partners (e.g., CDC, Lions, Rotary, USAID, etc.).

At the subnational level, vibrant local communities that actively engage with government are the norm in Nepal. The campaign to immunize all children would not have been so successful if it were not for the fact that both urban municipalities and village development committees (VDC) took ownership of the programme, working within their local areas to ensure that every eligible child was immunized. The goal would be much harder to achieve without support and engagement at the local level.

That the various ministries of the government must work together, is made clear in the NHSS, which sets out the government’s vision for the delivery of healthcare. Although the Ministry of Health and Population leads the efforts, assisted by the Regional Health Directorate and Department of Health Services, inter-departmental cooperation has already reaped benefits for the country. The Ministry of Health and Population and the Ministry of Federal Affairs and Local Development added an immunization indicator into their collaboration framework. Other line ministries, like the Ministry of Women, Children and Social Welfare and the Ministry of Education are also actively involved in ensuring the success of the immunization efforts.
The idea of vaccination – of deliberately introducing a small dose of a material from a harmful bacteria or virus into a person in order to prime their immune system to combat the organism – goes back as far as 1796, when Edward Jenner, an English physician, first tried this on one of his patients for smallpox. It was almost 200 years after this that the rubella vaccine was developed by Maurice Hilleman, an American microbiologist. Hilleman’s vaccine was licensed in 1969, and in 1971 it was combined with the measles and mumps vaccines to become the measles-mumps-rubella (MMR) vaccine. In Nepal it is administered as the MR – measles rubella – vaccine.
A dramatic impact

Routine immunization (RI) in Nepal began in 1979, and the rubella vaccine was introduced into the routine immunization programme in 2013 as a combined measles-rubella (MR) vaccine, given at the age of nine months. In 2015 a second dose of the MR vaccine at 15 months was added to the NIP. Despite this, the country saw a major measles outbreak in 2004 and cases of rubella also showed significant spikes in 2009 (1336 cases) and 2012 (675 cases). Supplementary immunization activities in the form of catch-up campaigns in 2012, 2015 and 2016 were carried out in multiple phases to cover the entire country and close the immunity gap. As a result, coverage rose to ~90% for the first dose, while coverage of the second dose is around 59%.

**Confirmed rubella cases, 2009 - 2017**

Between 2008 and 2017, there has been a 97% decline in the number of confirmed rubella cases.
Towards fully immunized districts

In 2016, the National Immunization Programme (NIP) set itself the ambitious goal of immunizing every child and declaring Nepal to be a fully immunized country. To do this, house-to-house surveys are conducted to identify children who are eligible for immunization. Those who have delayed or missed their vaccine are encouraged to be vaccinated. There are currently around 16 000 immunization sessions across the country each month, which comes to an annual figure of 192 000 immunization sessions. Mobile clinics serve hard-to-reach areas, making at least four annual visits to each area.

District Coordination Committees (DCCs) had been conducting random surveys of any village development committee (VDC) or municipality claiming that every child in its jurisdiction has been immunized with all antigens, including measles and rubella. If verified, a full immunization declaration (FID) is made, the certification of which is presented at a felicitation ceremony attended by senior officials of the Ministry of Health, politicians, community leaders and community groups. As of mid-2018, 55 of the 75 districts had been declared FID districts.
The introduction of the rubella vaccine has led to a 97% fall in the incidence of the disease since its base year of 2008.
Nepal has been working towards the control of rubella and CRS, defined as a 95% reduction as compared with the 2008 baseline levels. This means that all suspected cases have to be detected, investigated, using standard case definitions (the criteria that define a disease) and confirmed through laboratory testing or epidemiological linkage. None of this would be possible without a good surveillance system.

The surveillance system in Nepal was already in place before the 2013 WHO South-East Asia Regional Committee resolution on rubella and CRS control. Surveillance for rubella is closely linked with measles surveillance as the two diseases are clinically indistinguishable and laboratory testing can confirm the correct diagnosis. Case-based surveillance of measles and rubella had started in 2007, and in 2010 it became mandatory to report all rubella cases. In 2014 CRS, too, began to be monitored, with case-based surveillance. Given that rubella is endemic on both sides of the southern border of Nepal, there is a need to be vigilant not only against endemic cases, but also to ensure that an importation of the virus is quickly detected and contained.

Effective surveillance requires having eyes and ears across the country. There are 735 vaccine-preventable disease reporting sites and 520 case-based measles surveillance sites that report on suspected measles cases. In addition, there is hospital-based CRS surveillance in the Kathmandu valley, with four sentinel CRS sites. Surveillance has also been made more sensitive by expanding the case definition of the suspected measles cases to include all cases of fever and maculopapular rash, leading to a high sensitivity of the surveillance system.
The laboratory system in Nepal is adequate for the case load with two functional measles/rubella proficient laboratories – the National Public Health Laboratory in Kathmandu, which is accredited by WHO, and the BP Koirala Institute of Health Science in Dharan, Eastern Nepal, which is in the process of applying for WHO accreditation. Serum samples are sent to one or the other of these two laboratories for analysis, ensuring always that trained personnel have drawn the serum samples and that they are transported while maintaining the requisite cold chain.

It is commendable that in most key surveillance performance indicators, such as timely reporting, adequate investigation within 48 hours of being reported, and the required discard rate of suspected cases, to name just a few, Nepal not only meets but often also exceeds the targets set by WHO.

**Verification**

The National Verification Committee for Measles Elimination was established on 20 August 2015, with five members from the public health sector. Stand-alone and independent, the NVC is mandated to verify the elimination of measles and the control of rubella and CRS in Nepal.

The NVC’s responsibilities include reviewing data and information received from various points in the surveillance chain such as surveillance units and surveillance laboratories so as to verify progress made towards achieving the goal of controlling rubella and CRS. Periodic field visits, to assess the quality of data and to validate analysis and assessment, are also a part of the committee’s responsibilities, as is making recommendations to government based on its analysis of the data.
WHO is pleased to announce that at the third SEA-RVC conference, held in New Delhi in August 2018, the Regional Verification Commission for Measles Elimination and Rubella/CRS Control verified that Nepal has achieved its goal of controlling rubella and CRS, ahead of the target date of 2020.
LESSONS LEARNT

A robust immunization programme, committed political will and an engaged community have all contributed to the achievement of this rubella control ahead of time.

**Leadership spells success.** The high level of commitment from leadership at the national and subnational levels ensured Nepal’s success – from passing progressive legislation, to making and implementing plans by the leaders at the periphery.

**Planning is important.** With significant numbers of people living in remote and difficult to access parts of the country, and with the ever-present risk of natural catastrophe, detailed planning is needed to ensure that all segments of the population are served and that there are contingency plans in place should disaster strike.

**People are the pivot.** The best plan in the world is useless if it is not implemented effectively. An engaged and committed workforce is needed at every level, from garnering support for initiatives to ensuring efficient execution. Nepal’s health sector is energized by the people in its employ and with the health extension volunteers called Female Community Health Volunteers.

**Appreciation works.** Nepal has shown that it recognizes and appreciates the contributions made by workers at all levels with felicitation ceremonies and awarding recognition certificates and sometimes other incentives to female community health volunteers and health workers. This appreciation is reinforced in the NHSS for 2015–2020, which stresses the need for good human resources management.

**Robust community participation is pivotal.** Without the support of the people for whom it is intended, a plan cannot succeed. The success of the National Immunization Programme can be attributed in a large part to the cooperation of local communities. An immunization coordination committee exists from the national level to the lowest administrative block to ensure effective planning and implementation of plans to ensure no child is left behind.

**Cooperation is key.** A plan cannot exist in a vacuum. Cooperation and coordination between government departments, local bodies, international and national partners, the private sector and local communities are needed to ensure the seamless delivery of the health programme.
Technical assistance helps. Targeted technical assistance matching country priorities helps countries achieve their goals faster. It is widely acknowledged that the support provided by the Immunization Preventable Disease (IPD) Unit of WHO Nepal in all aspects of measles-rubella surveillance and immunization as well as support from other in-country key immunization partners like UNICEF Nepal have been pivotal in helping Nepal achieve this milestone in public health.

**Let memory keep us secure**

As Nepal enters its tenth year as a democratic republic, it can be proud of what it has achieved as it looks to secure its future. The fact that it has controlled rubella and CRS against all odds is indeed a cause for celebration, but not for complacency. As time passes, it is imperative that vaccine coverage is maintained and improved to ensure that herd immunity is not broken. The virus is dormant, but it still exists and the Government of Nepal and all its people must remain vigilant to ensure that it is given no opportunity to re-appear.
Nepal -
Back on top of the world