Policy Brief
CUHAS/PB/001/2016

STRATEGIC IMMUNIZATION TO CONTROL RUBELLA AND CONGENITAL RUBELLA SYNDROME IN TANZANIA

Key messages

- Rubella vaccination campaigns launched in 2014 are important interventions in efforts to control rubella and congenital rubella syndrome (CRS) in Tanzania
- A substantial proportion of pregnant women and adolescent girls do not have protective antibodies thereby putting them at high risk of acquiring primary infection that can lead to CRS.
- Screening and vaccinating women and adolescent girls without protective antibodies as a preventive measure is highly recommended
- Upper age limit for massive vaccination campaigns should be 10 instead of the current age of 15 years
- This policy briefs proposes a strategic cost effective immunisation package to control Rubella and Congenital Rubella Syndrome in Tanzania

Executive summary

Rubella is a viral disease caused by rubella virus which affects children, young adults and women of child bearing age. It is mainly transmitted through the respiratory route. It is a major public health concern due to its potential in causing poor pregnancy outcome ranging from spontaneous abortion, stillbirth to congenital rubella syndrome (CRS). CRS is principally characterized by congenital defects such as deafness, heart diseases

and blindness. Rubella infections remain to be under recognized public health problem in many resource-limited countries. There have been increased reports on congenital infections and anomalies associated with rubella virus worldwide. It is estimated that more than 100,000 children are born with CRS annually; majority being from developing countries. In Tanzania seroprevalence of > 90% has been observed among pregnant women and one outbreak has been reported. Recently, five cases of CRS have been confirmed in Mwanza. Rubella which is a vaccine preventable disease is in elimination phase in developed countries. Tanzania government has recently introduced rubella vaccine which is given in combination with measles vaccine (MR) at 9 and 18 months of age. However, pregnant women and adolescent girls which are the main target for effective control of CRS are not targeted in the current programme. In efforts to control CRS in Tanzania this policy brief recommends screening and vaccinating adolescent girls without protective antibodies (susceptible). In addition, susceptible pregnant women should be vaccinated after delivery. Lastly, the evidence available suggest the upper age limit during massive rubella vaccination campaigns to be 10 years. Available statistics from serosurvey in Tanzania provide evidence to strategically scale-up the vaccination coverage to include all susceptible groups in the population for effective control of CRS.

The problem

The current practice regarding rubella vaccination in Tanzania includes only infants at 9 months with booster dose at 18 months of age. The practice does not consider other susceptible groups such as pregnant women and adolescent girls. High transmission rates of rubella infection among pregnant women, under-fives and adolescents have been reported in Tanzania (Maselle et al., 1988, Ibrahim, 2015, Mwambe et al., 2014, Sasita et al., 2011). A similar trend has been observed in other African countries (Mirambo et al., 2015). In Tanzania 10-15% of pregnant women aged between 15 and 24 years do not have protective levels of rubella antibodies (susceptible) hence

at risk of acquiring primary rubella infection that can lead to CRS (Figure 1) (Mwambe et al., 2014). Since September 2014, all five clinically diagnosed CRS cases in Tanzania were confirmed to have specific rubella antibodies indicating congenital rubella infection.

As proposed by World Health Organization (WHO) that the seroprevalence data should guide the age limits and establishing target groups (WHO, 2000); this was not the case in Tanzania when considering introducing rubella vaccination in 2014. The upper age limit of 15 years proposed during launching of national rubella vaccination campaigns did not consider the local available data. Vaccinating children aged 10-15 years in a massive vaccination campaigns is not cost effective because there is no statistical difference in the level of protection among children aged 10-15 years compared to those above 15 years (Figure2). This added unnecessary extra cost to the government.

A substantial proportion of women of childbearing age without rubella protective antibodies in Tanzania and other African countries (Mwambe et al., 2014, Mirambo et al., 2015) signifies increasing potential risk for CRS. The proposed policy brief takes into consideration the importance of this information. These facts show that rubella is a problem in Tanzania like in many other African countries and might significantly contribute to the cases of congenital malformations in new-borns. It is therefore important to be strategic in implementation of rubella vaccination by considering target population and setting upper age limit for vaccination as described in the next section below.

In Tanzania 10-15% of pregnant women aged between 15 and 24 years do not have protective levels of rubella antibodies

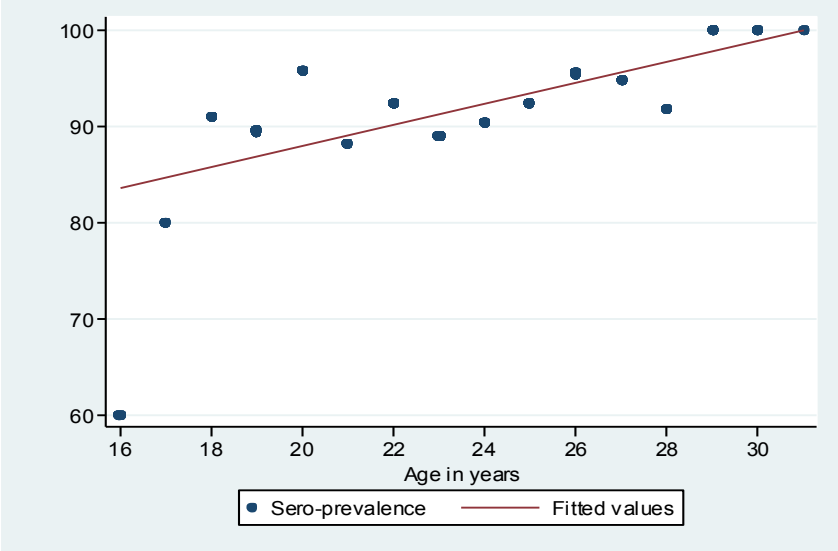

Figure 1: The risk of acquiring rubella infection increase by 12% as the age increase by one year among pregnant women

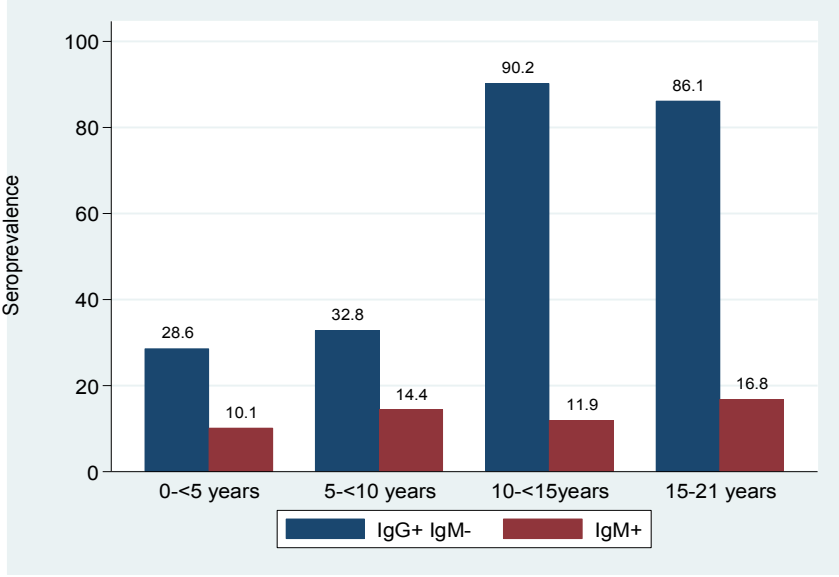

Figure 2: The magnitude of rubella infection in different age groups in Tanzania

Policy options

Despite the efforts in controlling rubella and CRS made by Tanzania government it is important to be strategic and cost effective in this programme. As per WHO recommendations and available evidence we propose the following:

The upper age limit during massive campaigns

Based on available evidence described above, the upper age limit for rubella vaccination during massive campaigns should be 10 years. Based on 2012 National Population Census, the 10-15 years' age group is made up of 5,792,587 people (NBS, 2012). Tanzanian government would have saved US$28m in 2014 campaigns if targeted vaccination would be restricted to 10 years limit instead of 15 years. The saved amount of money could be utilized to screen and vaccinate other target groups as well as introduce annual seroprevalence to provide the status of infection in the country.

Strategic vaccination to control CRS

We need to introduce a policy of screening and vaccinating susceptible adolescent girls. In addition, all pregnant women should be screened during antenatal visits and vaccination of all susceptible women after delivery should be done. This has been found to be effective way of controlling CRS in developed countries (Figure 3).

Enforcement of the available guidelines

As per World Health Organization (WHO) guidelines Tanzania government should emphasize sero-epidemiological surveys of rubella in conjunction with measles surveillance programs in place so that the data obtained can be used to monitor the success of the recommended options.

National birth defect registry

In order to track congenital defects magnitude and their impact, we need to introduce national birth defect registry in hospitals across the country. This will be useful in monitoring CRS cases.

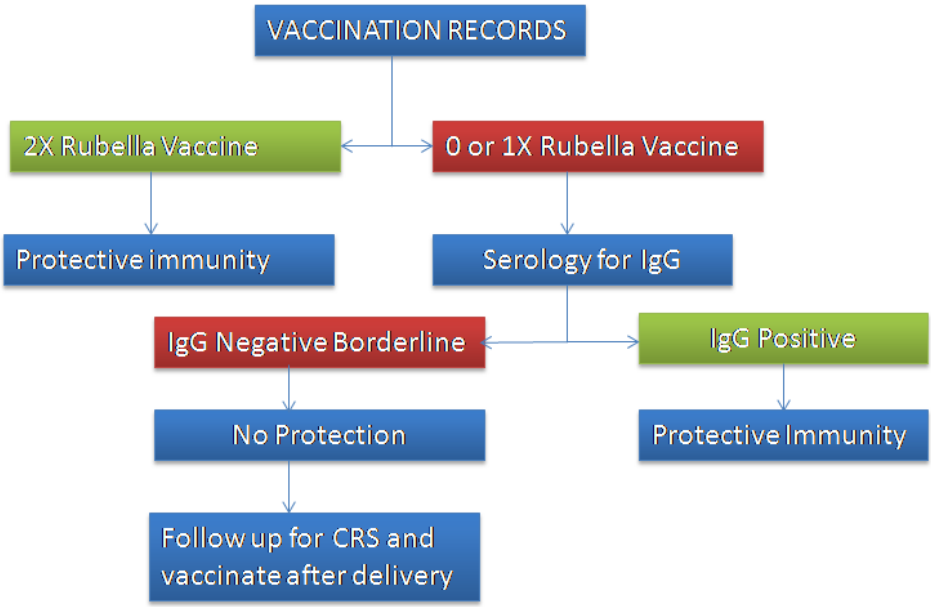

Figure 3: Flow chart showing strategy to control CRS (IgG: Indicate natural protection)

Implementation considerations

Using the existing intervention programmes such Antenatal Care (ANC) and Expanded Programme for Immunization (EPI) as well as local and International Non-Governmental Organizations will assist the Ministry of Health, Community Development, Gender, Seniors and Children in implementing the proposed policy. The following are critical factors for success implementation of the proposed policy options:

- Despite having limited health facilities with reproductive and child health (RCH) services in the country samples for screening women for rubella during ANC visits can be collected in dried blood sports (DBS) stored and transferred to the nearby zonal hospitals/ health centres for processing. This will allow a proper and effective implementation of the alternative ways of addressing policy issues.
- Advocacy among health care

workers, researchers and policy makers in implementation of rubella vaccination programme whereby this can be done parallel with other RCH services. CRS records from birth defect registry across the country will help in identification of cases and monitoring purposes

- Given the fact that all alternatives for implementation proposed are feasible this matter has to be given a priority as one of the important agenda in RCH services

Competing interests

The authors declared that they have no competing interests.

Acknowledgements

The development of this policy brief was supported by the Danish Agency for International Development through Building Stronger University project and the National Health Policy and Systems Research Hub Tanzania.

References

Ibrahim, M.M. (2015) Rubella antibody prevalence in 9 to 12 months old children before and after combined measles vaccination in Dar es Salaam. Tanzania. MSc. Dissertation, Muhimbili University of Health and Allied Sciences, Dar es Salaam,Tanzania

Maselle, S., Haukenes, G. & Rutahindurwa, A. (1998) Preliminary observations on rubella infection in Tanzaia and the challenge for its control. East African Medical Journal 65, 319-324.

Mirambo,M.M., Majibo, M., Aboud, S., Groβ, U. & Mshana, S.E. (2015) Serological makers of rubella infection in Africa in the pre vaccination era: a systematic review. BMC Research Notes 8: 716

Mwambe, B., Mirambo,M.M., Mshana, S.E., Massinde, A.N. et al. (2014) Sero-positivity rate of rubella and associated factors among prenant women attending antenatal care in Mwanza, Tanzania. BMC Pregnancy and Childbirth 14: 95.

NBS (2012) Population Distribution by Age and Sex. National Bureau of Statistics, Dar es Salaam, Tanzania

Sasita, S., Urio, S., Mohamed, S., Mghamba, J. & Mmbuji,

P. (2011) Rubella outbreak in Tanga City, Tanzania. East African Integrated Disease Surveillance Network Bulletin. East African Community, Arusha, Tanzania

WHO (2012) WHO position paper on rubella vaccines. Weekly Epidemiological Records 75: 161-172.

About the authors

Mariam M. Mirambo[1], Adolfine Hokororo[2], Neema B. Mrutu[3], Mtebe Majigo[4], Said Aboud[4], Uwe Groβ[5] and Stephen E. Mshana[1]

1 Department of Microbiology and Immunology, Weill Bugando School of Medicine, P.O. Box 1464, Mwanza, Tanzania
2 Department of Paediatrics and Child Health, Bugando Medical Centre, Mwanza, Tanzania
3 Department of Community Health, Bugando Medical Centre, Mwanza, Tanzania
4 Department of Microbiology and Immunology, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania
5 Institute of Medical microbiology, Gottingen University Medical Centre, Germany

Correspondence: Dr. Mariam M. Mirambo; Email: mmmirambo@gmail.com