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## Stochastic-Delay Model of Rubella Disease Dynamics with Two Dose Vaccine

## Getachew Teshome Tilahun

Haramaya University Department of Mathematics, Ethiopia

In this study, we proposed an SVPIRS stochastic-delay mathematical model of the dynamics of rubella disease by considering two dose of vaccine, incubation period and the environmental factor. From the perspective of the qualitative behavior of the model, it is bounded in the invariant region and all the solutions of the compartments are positive. The equilibrium points and the stability of the equilibrium points (local and global) are analyzed. The basic reproduction number for the delay and stochastic-delay models is determined using the next-generation matrix. The basic reproductive number in the case of the stochastic-delay model is smaller than that of the delay due to the consideration of randomness. The results of the sensitivity analysis show that rubella spreads in the community by increasing the value of basic parameters such as contact and the vertical transmission rate. On the other hand, increasing first and second vaccination rates and treatment rates can help to eradicate rubella in the community. The results of the numerical simulation show that due to the lack of protection of women during pregnancy, the number of infections increases with the birth of infected children and unpredictable person-to-person contact.

## **Biography**

Dr. Getachew Teshome has completed his PhD at the age of 30 years from Jemo Kenyatta University of Agriculture and Technology. He is the director of Freshman Program Directorate of Haramaya University, Ethiopia. He has published more than 15 papers in reputed journals and has been serving as reviewer for different journals