

## MATHEMATICAL MODEL OF THE TRANSMISSION DYNAMICS OF SWINE FLU WITH THE VACCINATION OF NEWBORNS

ONUOHA JOY LJEOMA<sup>2</sup>, INYAMA SIMEON CHIOMA<sup>2</sup> AND UDOFIA  
SUNDAY EKERE<sup>3</sup>

<sup>1</sup> Department of Mathematics,  
Alvan Ikoku Federal College of Education,  
Owerri, Imo State, Nigeria, West Africa

<sup>2</sup> Department of Mathematics,  
Federal University of Technology,  
Owerri, Imo State, Nigeria, West Africa

<sup>3</sup> Department of Mathematics/Statistics,  
Akwa Ibom State University, Mkpato Enin,  
Akwa Ibom State

### Abstract

In this paper, the mathematical model for the transmission dynamics of swine flu among swine and humans with the vaccination of newborns is presented. The model assumes a vaccine with a life-long immunity. The analysis of the Disease-free Equilibrium (DFE) shows that it will be stable if there is a bound on the rate of transmission from swine to swine ( $\beta_s$ ) and the rate of transmission from human to human ( $\beta_H$ ). Endemic Equilibrium (EE) for the model shows that the disease will persist if there is a lower bound on the rate of transmission from swine to swine ( $\beta_S$ ) and on the rate of newborn babies vaccinated ( $V_H$ ). The behavior of the influenza (flu) is illustrated by simulation with different parameter values.

---

Key Words : *Mathematical model, Swine flu, Vaccination, Newborns, Endemic Equilibrium.*