Strategizing Pandemic Response: Advancing Influenza Control through Predictive Mathematical Modeling

BIOMATH 2024

Soyoung Kim[1], Eunok Jung[3]

[1]Innovation Center for Industrial Mathematics,
National Institute for Mathematical Sciences, Republic of Korea
skim@nims.re.kr

[2]Department of Mathematics,
Konkuk University, Republic of Korea
junge@konkuk.ac.kr

Mathematical modeling plays a crucial role in understanding and managing influenza, particularly in preparing for and responding to future pandemics. Models can simulate how the flu virus spreads within populations. This helps in identifying key factors that influence transmission. By simulating various scenarios, models aid in planning how to allocate limited resources effectively such as vaccines or antiviral drugs. This is particularly important in a pandemic situation where demand can outstrip supply. Models can also estimate the economic impact of influenza pandemics, including costs to healthcare systems.

In this work, we will introduce the mathematical model for influenza pandemic based on H1N1pdm09 in the Republic of Korea and suggest the effective intervention strategies for the future influenza pandemic.

References

[1] S. Kim, J. Lee, E. Jung, Mathematical model of transmission dynamics and optimal control strategies for 2009 A/H1N1 influenza in the Republic of Korea, *Journal of Theoretical Biology*, 412(7):74-85, 2017.

[2] S. Kim, Y. B. Seo, J. Lee, Y. S. Kim, E. Jung, Estimation of optimal antiviral stockpile for a novel influenza pandemic, *Journal of Infection and Public Health*, 15(7):720-725, 2022.