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The use of SIR model in infectious disease modeling

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The SIR model was used in this study to observe the changes in number of susceptible, infective and removals with changes in the rates susceptible become infective and rates infective recover. Rates chosen are: Infective rates of 0.2, 0.4, and 0.6; recovery rate of 0.2, 0.4 and 0.6 for $N=20$. The results show that as recovery rate increases, the number of infectives reduces; also, as the infective rate increases, the rate at which the number of susceptible decrease. It was discovered that when infective rate is 0.2 and recovery rate is 0.6, at least 50% of the population must be immunized within 16 days to control the disease. However, 93% must be immunized to control the disease if infective rate is increased to 0.4 within 41 days. For infective rate of 0.6, 95% of the population must be immunized within 40 days to control the disease. The model was further subjected to an open population by introducing immigration and emigration. The same rates used in the closed population are also used in the open population. It was discovered that not all the susceptible were infected when infective rate is 0.6 as it occurred in the closed population, and that the higher the infective rate, the higher the number of people who become infected. When the changes in number that recovered with the changes in rates infective were removed, it was observed that higher the recovery rate is, higher is the number of people who recovered in both cases.

Biography

John Bamidele Babalola obtained his first degree in mathematics (BSc) from the University of Port-Harcourt in 1982, Post Graduate Diploma and Master's degree in Statistics (PGDS, MSc) from the University of Ibadan in 1990 and 1997 respectively. He also did his Post Graduate Diploma in Computer Science and Education, (PGDCS, PGDE) from University of Ilorin and National Teacher Institute Kaduna Nigeria in 2002 and 2007 respectively. He has been lecturing Mathematics and Statistics in the Polytechnic since 1983. He is currently a Chief Lecturer, the highest academic position in the polytechnic in Nigeria. As the Head of Mathematics/ Statistics Department (currently), Director Centre for Continuing Education, Member of Academic Board, Member of Council Committee, Chief Examination Officer. He has published many national and international journals, text books and has attended many workshops and conferences.

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