

Reproduction Number [ˈr̥e-prə-ˈdak-shən ˈnəm-bər]

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The basic reproduction number (R_0 , pronounced R naught) is derived from demography terminology used to estimate the overall population reproduction rate. R_0 is an essential metric in the study of epidemics. This value measures the estimated number of new cases of an infection caused by an infectious person in a population of disease-susceptible person.

The effective reproduction number (R_t) is similar to R_0 , but R_t measures the number of persons infected by infectious person when some portion of the population has already been infected. This idea can be traced back to the work performed by Richard Bockh, Alfred Lotka and others.

A modern application of R_0 in epidemiology was reported in 1952 when George Macdonald constructed population models about the spread of malaria. Macdonald used the notation Z_0 instead of R_0 to differentiate it from the preceding demography terminology. The notation R_0 was adopted instead of Z_0 during the Dahlem conference in 1982 (Figure).

1886	1907	1952	1982
Richard Bockh	Alfred Lotka	George Macdonald	Dahlem conference
R_0	r	Z_0	R_0
Die totale Fortpflanzung der Bevölkerung*	Net fertility	Basic reproduction rate of malaria	Basic reproduction no.
Average no. female offspring produced by 1 woman during her lifespan	Rate of natural increase per head of population with constant birth and death rate	No. infections distributed in a community as result of presence in it of 1 primary nonimmune case	No. secondary infections resulting from a single primary infection into otherwise susceptible population
Demography	Demography	Epidemiology	Epidemiology

Figure. History and concept of basic reproduction number (R_0). *The total reproduction of the population.

Sources

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