

Mathematical theories of populations: demographics, genetics, and epidemics

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20451153&lokasi=lokal>

Abstrak

Mathematical theories of populations have appeared both implicitly and explicitly in many important studies of populations, human populations as well as populations of animals, cells and viruses. They provide a systematic way for studying a population's underlying structure.

A basic model in population age structure is studied and then applied, extended and modified, to several population phenomena such as stable age distributions, self-limiting effects, and two-sex populations. Population genetics are studied with special attention to derivation and analysis of a model for a one-locus, two-allele trait in a large randomly mating population. The dynamics of contagious phenomena in a population are studied in the context of epidemic diseases.