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Acquiring Immunity against Reinfection for Some Time or for Lie

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Description

By focussing on the overall population biology of associations between hosts and parasites and emphasizing broad themes that are common to most systems we seek to provide a framework within which a vast amount of information about parasitic infections may be organized in an orderly way. We aim to codify similarities and differences among the various viral, bacterial, protozoan fungal and helminthic parasites identifying the ecologically based patterns of relationships among epidemiological parameters such as transmission rates, virulence, life span of the parasite within the host and so on.

The distinction between micro-parasites and macro-parasites this rough dichotomy cuts across conventional taxonomic lines to focus on the population biology of the parasite. The idea of the basic reproductive rate of the parasite and then goes on to outline some ideas about threshold host densities and about modes of transmission.

Micro-parasites thought of as those which have direct reproduction usually at very high rates within the host. They tend to be characterized by small size and a short generation time. Hosts that recover from infection usually acquire immunity against reinfection for some time and often for lie. Although there are important exceptions the duration of infection is typically short relative to the expected life span of the host. This feature combined with acquired immunity means that for individual hosts micro-parasitic infections are typically of a transient nature. Most viral and bacterial parasites and many protozoan and fungal parasites fall broadly into the micro-parasitic category.

For such infective agents, it makes sense to divide the host population into relatively few classes of individuals susceptible, infected, recovered and immune. Such a compartmental model for the dynamic interaction between parasitic and host population is depicted. Our operational definition of a micro-parasite is indeed an organism whose population biology can be sensible first approximation be described by some such compartmental model.

Greater detail and realism can be achieved by adding more compartments or categories to the model. The essential feature of these compartmental models, however is little or no account is taken of the degree of severity of the infection the abundance of the parasite within the host individuals either have measles or they do not. In other words, the reality of infected individuals with differing nutritional, environmental or generic status is replaced by the simplified abstraction of some average infected or immune individual.

In addition to the distinction between infected and immune hosts, it is often desirable to distinguish between infection and disease. Thus, for example, in the literature concerned with micro-parasitic infections of humans, the period from the point of infection to the appearance of symptoms of disease is termed the incubation period. The duration of symptoms of disease is not necessarily synchronous with the period during which an infected host is infectious to susceptible individuals. Furthermore a host may be infected but not yet infectious. The period from the point of infection to the beginning of the state of infectiousness is termed the latent period. With respect to the ecology of parasite transmission the sum of average latent and average infectious periods is referred to as the average generation time of the infection.

Most of the epidemiological and demographic parameters host birth and death rates; disease induced death rates recovery rates, rate of loss of immunity can be measured directly by appropriate studies. The transmission rate however combines many biological, social and environmental factors and is thus rarely amenable to direct measurement.