The dynamics of infectious disease

What is an infectious disease?

The above question will lead us to examine the following entities of infectious diseases, a) Identity, b) classification, c) virulence, and d) infectiousness of infectious diseases.

A. Infectious diseases can be identified as:

- diseases that can be transmitted or communicated only through *direct or proximate contacts.*
- clinically evident illnesses resulting from the presence of *pathogenic microbial agents.*
- diseases that can be *transmitted from person to person or from organism to organism*
- diseases that can attack their hosts causing a *weak immune response* and *rendering the body vulnerable and incapable* to function normally.
- *contagious* and non-contagious disease (see difference between contagious and non-contagious diseases).

B. Infectious diseases can be classified as either *primary pathogens* or *opportunistic pathogens*

i. **Primary pathogens**: They are called primary pathogens because the main goal of these microbes is to attack, destroy or weaken the disposability of a normal and active host to carry out its functions or defend itself (e.g., mycosis). Primary pathogens that attack humans are not found in animal/bird.

ii. **Opportunistic pathogens:** In contrast to primary pathogens, opportunistic pathogens are microorganisms that are already in contact with the host, however, they are not well equipped to initiate head-on confrontations with immunosufficient host (fully energized body defense systems), but are potentially equipped to target and take advantage of dysfunctional or weakened antigens. The disease-situation of primary pathogens can be severe in a host with depressed resistance (weak immunity) than would normally be the case in an immunosufficient host. These microbes lay dominant in their host, waiting for the opportunity to strike, enhance the term "opportunistic." Example is HIV/AIDS of which many deaths or severe disabilities are not caused by the diseases of HIV, but by the attacks of opportunistic pathogens. Unlike primary pathogens, opportunistic pathogens may cause diseases in many species of mammals (living things backbone or spine, however, some exceptions can be made here. Some opportunistic microbes, like rabies and tetanus, can actually inhabit and cause disease in humans as well as in other animal species.

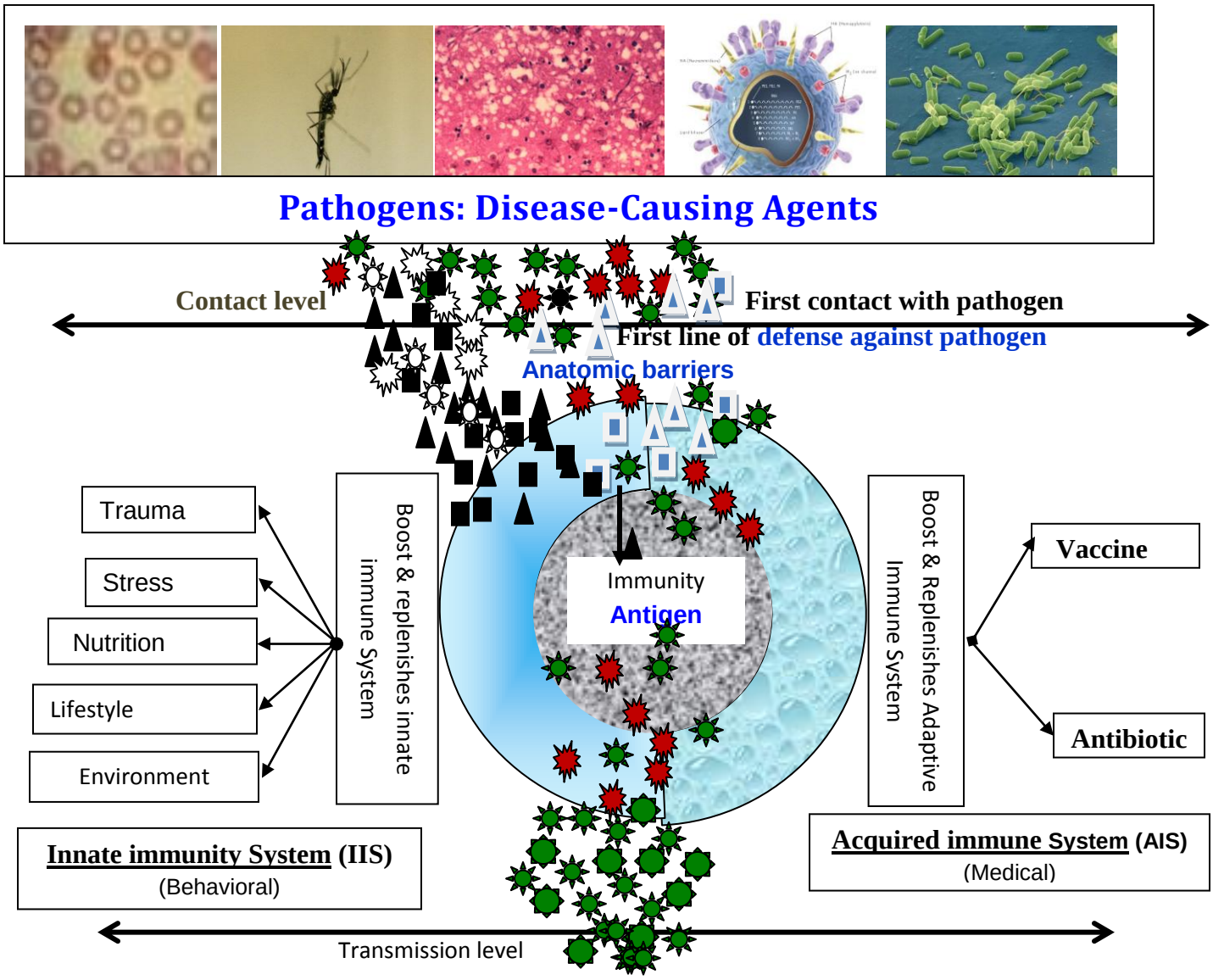
C. The *virulence of infectious diseases* can be measured by:

- the severity of diseases they cause on hosts and their apparent pathogenicity.
- the degree to which a pathogen can cause damage to its host environment.
- virulence is multifactoral because it records the complexities of a pathogen (e.g., a parasite) and the factors (age, gender, genetics, life-events, nutrition, and immune system) that sustain their activities.

D. The *infectiousness* of an infectious disease include:

- the comparative alacrity or ease with which the disease spread or communicated to other hosts
- distinction between an infection and infectious disease (Ryan, K.J & Ray, C.G (2004). While an infection do not necessarily cause severe clinical symptoms or impaired function, infectious diseases are known for their damage to the host and their ability to transmit and sustain their actions in another host.
- the levels (**contact**, **sustained** and **transmission**) of infectious diseases (Gonçalves, 2010).
- measures the *sporadic* (irregular cases), *endemic* (regular cases within a specific region or area), epidemic (an unusually elevated and significant prevalence of cases in a given population), or pandemic (spread globally) nature of a disease outbreak.

Figure 1: The dynamics of infectious disease



The IIS is known as nonspecific defense agents because it is structure to fight any type to pathogen and in normal circumstances; it is always ready to be deployed for action at the first signs of invading pathogens. The AIS is custom-made to respond to a specific type of group of pathogen and they are needed when the IISs fail to respond to the invading pathogen. As illustrated above, the IIS defense agents are living organisms in our body, whose survival and adequate performance of their functions depend solely on the energy derived from human body. The best energy boost and replenishments for the IISs is natural mineral contented (or not contained) in our food, drink, mental and emotional states, as well as our personality. The AISs (vaccine and antibiotics) are synthetically produced and injected substances that mimic the functions of IIS. However, it has been discovered that some pathogens to resist AISs and effectiveness of AIS depends on natural state of the individual

Overpowering pathogens

Overpowered immune defense system

Overpowering IISs

Killed Pathogens