

## Infectious Diseases Burden and Surveillance: An Epidemiological Survey

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### Editorial

Through the ancient plaque till the recent human immunodeficiency virus all have played a pivotal role in developing diseased condition in human beings. It could be the result of expansion in human population as well as inventions of new strains of infectious agents.

Understanding the nature of infectious agent / pathogen is very important to prevent and control the infection at population level. Communicable diseases continue to pose a threat for not only the third world but also South Eastern Europe countries. Addition of new infectious agents with old diseases are reappearing and developing drastic effects on human population. These diseases include tuberculosis, West Nile fever, human immunodeficiency virus and other sexually transmitted diseases. Much of this evolving disease burden began in the early 1990s [1].

The World Health Organization collects information on global deaths by International Classification of Disease (ICD) code categories. The list includes the top infectious disease killers which caused more than 100,000 deaths in 2002 (Table 1) [2,3].

| Rank    | Cause of Death               | Death in 2002 (Millions) | % of Death |
|---------|------------------------------|--------------------------|------------|
| N/A     | All infectious diseases      | 14.7                     | 25.9%      |
| 1       | Lower respiratory infections | 3.9                      | 6.9%       |
| 2       | HIV/AIDS                     | 2.8                      | 4.9%       |
| 3       | Diarrheal diseases           | 1.8                      | 3.2%       |
| 4       | Tuberculosis                 | 1.6                      | 2.7%       |
| 5       | Malaria                      | 1.3                      | 2.2%       |
| 6       | Measles                      | 0.6                      | 1.1%       |
| 7       | Pertussis                    | 0.29                     | 0.5%       |
| 8       | Tetanus                      | 0.21                     | 0.4%       |
| 9       | Meningitis                   | 0.17                     | 0.3%       |
| 10      | Syphilis                     | 0.16                     | 0.3%       |
| 11      | Hepatitis B                  | 0.10                     | 0.2%       |
| 12 - 17 | Tropical diseases            | 0.13                     | 0.2%       |

Table 1: Report from WHO

Note: Other causes of death include maternal and perinatal conditions (5.2%), nutritional deficiencies (0.9%), non-communicable conditions (58.8%), and injuries (9.1%).

The top three single agent/disease killers are HIV/AIDS, Tuberculosis and malaria. While the number of deaths due to nearly every disease has decreased, deaths due to HIV/AIDS have increased fourfold [2].

Childhood diseases include pertussis, poliomyelitis, diphtheria, measles and tetanus. Children also make up a large percentage of lower respiratory and diarrheal deaths [2].

According to a report from Canada in 2013 the rate of STD infections is increased since 1997 and in 2008 it is about 70%, for chlamydia infection it is 51%. HIV attacks the immunity of a person also develops the chronic progressive illness that can make the person susceptible to other infections. It can transmitted both vertical and horizontal mode. A 11.4% increase in HIV cases was reported in Canadian population from 2008 to 2013 [4,5].

Beside microorganisms and environmental factors human genetic factors also plays a particular important role in immunodeficiency and susceptibility to infectious diseases [6]. The first evidence supporting the genetic theory of infectious diseases came from observations of ethnic and familial aggregation of both rare and common infections, which even followed a Mendelian (monogenic) pattern of inheritance in some kindreds. Follow-up studies of adoptive children also showed that predisposition to infectious diseases was largely inherited, paradoxically more so than that to diseases associated with less-well-known environmental risk factors, such as cancer. Finally, the concordance rate of infectious diseases is higher in monozygotic twins than in dizygotic twins, implicating host genetic background in susceptibility to these diseases [7].

Diagnosis plays an important role in treating the disease. The neutralizing antibodies play a key role in providing protection against a range of viral infections like, Polio, measles, hepatitis, and influenza. It is widely accepted that these antibodies probably also participates in providing protection against HIV type 1 infection [8].

In 1998 an energetic debate over how to organize surveillance programed against the infectious diseases in the European Union concluded in the decision by the European parliament and council to form a network instead of a large surveillance center [9]. Surveillance is the ongoing and timely systematic collection, analysis and interpretation of data essential to public health practice. The occurrence of any infectious disease that are very important need to be reported to public health officials [10].

I concluded by the saying of historian Charles Rosenberg he wrote "Disease necessarily reflects and lays bare every aspect of the culture in which it occurs".

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