COURSE : DISASTER MANAGEMENT (MA/MSc PART I)
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INTRODUCTION

The historical association between military action and outbreaks of infections suggest a strategic role for biological agents. The nondiscriminatory nature of biological agents limited their use till specific, protective measures could be devised for the 'home' troops. The advances in bacteriology, virology and immunology in the late 19th century and early 20th century enabled nations to develop biological weapons. The relative ease of production, low cost and low level of delivery technology prompted the efforts of many countries after World War (WW) I, which peaked during the cold war. The collective conscience of the world, however, resulted in the Biological and Toxin Weapons Convention which resolved to eliminate these weapons of mass destruction. Despite considerable enthusiasm, the convention has been a non-starter. While biological warfare does not appear to be a global threat, the use of some agents such as anthrax by terrorist groups pose a serious threat. The ease of production, packaging and delivery using existing non-military facilities are major factors in threat perception. These artificially induced infections would behave similar to natural infections (albeit exotic) and would be difficult to detect except by an effective disease surveillance mechanism. The threat posed by bioterrorism is nearly as great as that by natural epidemic causing agents. Mitigation The essential protection against natural and artificial outbreaks of disease (bioterrorism) will include the development of mechanisms for prompt detection of incipient outbreaks, isolation of the infected persons and the people they have been in contact with and mobilisation of investigational and therapeutic countermeasures. In the case of deliberately generated outbreaks (bioterrorism) the spectrum of possible pathogens is narrow, while natural outbreaks can have a wide range of organisms. The mechanism required however, to face both can be similar if the service providers are adequately sensitised. The response to these challenges will be coordinated by the nodal ministry—Ministry of Health and Family Welfare (MoH&FW) with inputs from the Ministry of Agriculture (MoA) for agents affecting animals and crops. The support and input of other ministries like Ministry of Home Affairs (MHA), Ministry of Defence (MoD), Ministry of Railways (MoR) and Ministry of Labour and Employment (MoL&E), who have their own medical care infrastructure with capability of casualty evacuation and treatment, have an important role to play. With a proper surveillance mechanism and response system in place, epidemics can be detected at the beginning stage of their outbreak and controlled. Slowly evolving epidemics do not cause upheavals in society and will not come under the crisis management scenario usually. They will be tackled by ongoing national programmes like the Revised National

Tuberculosis Control Programme and National Air Quality Monitoring Programme. There may, however, be specific situations when the disaster response mechanism may be evoked, e.g., an outbreak of Plasmodium falciparum malaria erupting after an exceptionally wet season in a previously non-endemic region and epidemics occurring as a consequence of an attack of bioterrorism. Epidemics do not respect national borders. As international travel is easy, biological agents need to be tracked so that they do not enter new regions across the boundaries. This aspect has made international collaboration crucial for epidemic control. International organisations like the World Health Organization (WHO), Food and Agricultural Organization (FAO), as well as some national agencies with global reach, e.g., Center for Disease Control and Prevention (CDC), United States of America (USA) have an important role to play and cooperation with them is necessary.

Common examples of biological hazards include:

- Malaria, Dengue fever
- Meningitis, influenza
- Pest infestations
- Zoonoses - HIV, H5N1 virus (Bird flu), H1N1 (Swine Flu), the plague, Anthrax, Cholera, Leptospirosis
- Medical wastes - Used needles, medication that has expired etc.

A society or community can be seen as vulnerable to biological hazards because of the following:

- Poor sanitation practices: indiscriminate dumping, polluting of drainage channels and sewers, consumption of contaminated water or food etc.
- Hospitals and medical centres dispose of medical wastes improperly
- Individuals do not practice safe sex or have generally poor hygiene
- Limited border control and protection
- Lack of understanding of the risks and causes of the hazards
- Limited or non-existent hazard response capabilities i.e. trained and well equipped personnel who know how to respond to a biologically hazardous incident.
- Hospitals have limited or non-existent quarantine capabilities to control the spread of diseases or treat affected persons.
- Limited access to vaccines that prevent the spread
- No known cure or vaccine for biological agents
- Civil unrest, malicious intent or terrorist activity existing the country