Research scope of Infectious diseases have different ways of spreading from person to person. They can be spread in three main ways: through the air, through direct contact between people, and/or contaminated objects or surfaces. Droplets containing small particles of a disease, such as measles, chickenpox and influenza (the flu), can be present in the air when an infected person coughs or sneezes. Breathing in these infectious particles is how you get sick. Touching an infected animal, person or their bodily fluids and not washing your hands, increases your risk of giving yourself and others the infection. Possible bodily fluids are saliva, blood, sweat, urine (wee) or faeces (poo). Examples of infectious diseases include norovirus and Hepatitis B. Touching a surface or object that has been contaminated by an infected person's disease particles and not washing your hands, increases the risk of giving yourself or others the disease. Examples of infectious diseases include influenza (particles of virus from a sneeze) and norovirus. Infectious diseases can be caused by several different classes of pathogenic organisms (commonly called germs). These are viruses, bacteria, protozoa, and fungi. Almost all of these organisms are microscopic in size and are often referred to as microbes or microorganisms. Although microbes can be agents of infection, most microbes do not cause disease in humans. In fact, humans are inhabited by a collection of microbes, known as the microbiome, that plays important and beneficial roles in our bodies. The majority of agents that cause disease in humans are viruses or bacteria, although the parasite that causes malaria is a notable example of a protozoan. Examples of diseases caused by viruses are HIV/AIDS, influenza, Ebola, MERS, smallpox, diarrheal diseases, hepatitis, and West Nile. Diseases caused by bacteria include anthrax, tuberculosis, salmonella, and respiratory and diarrheal diseases.

There are a number of different routes by which a person can become infected with an infectious agent. For some agents, humans must come in direct contact with a source of infection, such as contaminated food, water, fecal material, body fluids or animal products. With other agents, infection can be transmitted through the air. The route of transmission of infectious agents is clearly an important factor in how quickly an infectious agent can spread through a population. An agent that can spread through the air has greater potential for infecting a larger number of individuals than an agent that is spread through direct contact. Another important factor in transmission is the survival time of the infectious agent in the environment. An agent that survives only a few seconds between hosts will not be able to infect as many people as an agent that can survive in the environment for hours, days, or even longer. These factors are important considerations when evaluating the risks of potential bioterrorism agents. Infectious diseases have plagued humans throughout history, and in fact have even shaped history on some occasions. The plagues of biblical times, the Black Death of the Middle Ages, and the "Spanish flu" pandemic of 1918 are but a few examples. The 1918 flu pandemic killed more than a half million people in the United States and up to 50 million people worldwide and is thought to have played a contributing role in ending World War I. Impact of Infectious Diseases on Society. Infectious diseases have plagued humans throughout history, and in fact have even shaped history on some occasions. The plagues of biblical times, the Black Death of the Middle Ages, and the "Spanish flu" pandemic of 1918 are but a few examples. The 1918 flu pandemic killed more than a half million people in the United States and up to 50 million people worldwide and is thought to have played a contributing role in ending World War I. Epidemics and pandemics have always had major social and

economic impacts on affected populations, but in our current interconnected world, the impacts are truly global.

Another recent example of an infectious disease outbreak is the H1N1 influenza or “swine” flu pandemic that began in the spring of 2009. For the first time in the long history of flu pandemics, the beginnings of an outbreak were detected, and the spread of the disease was monitored on an almost daily basis as air travelers carried it around the globe. The new H1N1 flu traveled around the world with unprecedented speed and in a few short months made its impact felt globally. Even though the disease was relatively mild for most people, some schools closed – more than 700 across the United States at its peak - and a number of infected people were quarantined. Mexico suffered great economic loss and damage to its tourism industry in an attempt to contain the outbreak in its early stage. After the H1N1 flu waned, yet another variant of influenza virus emerged. The new H7N9 virus was first detected in birds and humans in China in the spring of 2013, but it currently does not appear to be spreading from person to person. A severe pandemic potentially could cause major disruptions to national and global economies, close schools and businesses for weeks, restrict social interactions, and lead to disagreements between nations regarding the allocation of limited doses of antiviral drugs and vaccine. Meningococci are fairly common inhabitants of the throat, in most cases causing no illness at all. As the number of healthy carriers increases in any population, however, there is a tendency for the meningococcus to become more invasive. When an opportunity is presented, it can gain access to the bloodstream, invade the central nervous system, and cause meningococcal meningitis (formerly called cerebrospinal meningitis or spotted fever). Meningococcal meningitis, at one time a dreaded and still a very serious disease, usually responds to treatment with penicillin if diagnosed early enough. When meningococci invade the bloodstream, some gain access to the skin and cause bloodstained spots, or purpura. If the condition is diagnosed early enough, antibiotics can clear the bloodstream of the bacterium and prevent any from getting far enough to cause meningitis. Sometimes the septicemia takes a mild, chronic, relapsing form with no tendency toward meningitis; this is curable once it is diagnosed. The meningococcus also can cause one of the most fulminating of all forms of septicemia, meningococcemia, in which the body is rapidly covered with a purple rash, purpura fulminans; in this form the blood pressure becomes dangerously low, the heart and blood vessels are affected by shock, and the infected person dies within a matter of hours. Few are saved, despite treatment with appropriate drugs.