Leptospira wherever it is sought (Leshem et al., 2011). It is said that it can be found tospirosis is a gram-negative bacterium and is the most common zoonosis worldwide. It is said that it can be found fastidious and difficult to isolate by cultivation methods. Therefore, the patient's travel history and exposures often are the only hint to the zoonotic nature of the illness. Leptospira is difficult because many of the zoonotic pathogens are fastidious and difficult to isolate by cultivation methods. Therefore, the patient’s travel history and exposures often are the only hint to the zoonotic nature of the illness. Leptospirosis is a gram-negative bacterium and is the most common zoonosis worldwide. It is said that it can be found wherever it is sought (Leshem et al., 2011). Leptospirotrachnoped has about 250 known serovars, but only 14 are considered pat-hogenic. Leptospira can infect a wide variety of animals. Leptospira is contracted in contaminated water or by direct contact with infected animals. Its incidence is higher in tropical countries as compared to countries with a moderate or cold climate. Increased temperature and humidity are factors that contribute to its survival in the environment. The main reservoirs are rodents (mainly rats), dogs, cattle, and ruminants. Typical exposure situations include fresh water-related sports such as swimming, water skiing, and rafting, but may also include wading barefoot through fresh water contaminated with rodent wastes. Not surprisingly, exposures are more likely in regions with low hygiene standards and lack of (maintained) sewer systems. Patients who develop mild symptoms may present fever, chills, headache, and myalgia. Severe symptoms include renal failure, hepatitis, jaundice, myocarditis, and meningoencephalitis. Leshem et al. (2011) report that in Israel, 55% of travel-related cases were of the severe form, but mortality was rare. Diagnosis depends much on identifying the patient’s travel history, and recreational and occupational water exposure. Because (reliable) molecular tools are not yet available, the diagnosis still relies much on serological tests (Leshem et al., 2011). Prevention includes avoidance of fresh water exposure. Rickettsia sp. are gram-negative and obligate intracellular bacteria. The most common travel-related rickettsiosis is caused by R. africae. Q-fever, scrub typhus, and murine typhus are rarely found in travellers (Leshem et al., 2011). The animal reservoir of R. africae mainly consists of cattle, but it is transmitted by arthropod vectors such as ticks. Rickettsiosis predominantly affects travellers to Southern and Eastern Africa, classically after a safari when the traveller had entered the vector’s habitat (e.g., African tick bite fever, ATBF). The symptoms almost always include fever. In travellers, rickettsial diseases are the third common cause of fever, after malaria and dengue. Diagnosis includes molecular methods.


Five Easy Mutations to Make Bird Flu a Lethal Pandemic

Research carried out at the Erasmus Medical Centre in Rotterdam, The Netherlands, on how many mutations could allow H5N1 avian influenza virus to spread among ferrets in the laboratory has started a vivid debate whether such research should be done and published or not. According to reports in The New Scientist (MacKenzie, 2011) and the New York Times (Grady & McNeil, 2011), H5N1 has evolved in poultry in East Asia and from there has spread across Asia, Europe, and parts of Africa. The naturally occurring H5N1 strains already are quite lethal to humans without genetic modification (lethality is approximately 50%), but the transmission likelihood from animals to humans is rare and from humans to humans remote. Fortunately, in nature, H5N1 strains have not (yet) evolved to spread easily from animals to humans and from humans to
humans. Scientists fear that such a genetic change would create the deadliest influenza epidemic since 1918. Some scientists said that H5N1 cannot mutate in this way, but the Dutch group reported at a science conference in Malta last September that only five mutations in two genes are required to yield a virus that is transmitted like seasonal flu virus among ferrets (Grady & McNeil, 2011; MacKenzie, 2011). The announcement at the Malta conference has sparked a discussion on the scientific value of such research on the one hand and the risk that the experiments could be misused by rogue scientists, governments, or terrorists on the other (Grady & McNeil, 2011). Comment added after editorial deadline: The ongoing discussions (as of end of February 2012) indicate that a final agreement on how dangerous this research is has not been reached (Grady, 2012).


Room Ventilation and the Risk of Airborne Infection Transmission in 3 Health Care Settings Within a Large Teaching Hospital

Knibbs et al. (2011) investigated the effect of room ventilation rates on influenza, tuberculosis, and rhinovirus infections in three distinct rooms in a major urban hospital. Starting with the knowledge that room ventilation serves to dilute and remove airborne droplet nuclei (aerosols), they selected a 169 m³ respiratory investigation laboratory, a negative-pressure isolation room (24 m³), and two separate outpatient consulting rooms (32 m³ and 36 m³) for the experiments. Air exchange rates (ACH) were monitored with CO₂ as a tracer gas. For each of the three pathogens, the airborne transmission risk was modeled with two different mathematical models applied to two general scenarios: The risk of infection for a susceptible person who is together with an infectious patient in the respiratory investigation laboratory (exposure times between 15 and 45 minutes), and the risk of infection for a susceptible person spending between 30 minutes and 8 hours in the isolation room immediately after an infectious patient has left the room after 30 minutes of occupancy. A third more complex situation was also modeled using the consultation rooms: The risk of infection for a healthy person staying in the consultation rooms for up to 2 hours after the room was occupied by an infectious patient for 15, 60, and 120 minutes. To simulate typical usage of the rooms, the door was left open for 5 minutes after the infectious patient had left the room. For this more complex scenario, only influenza was used. ACH were varied between 0 and 10 in the lung function laboratory. In the isolation room, ACH was around 24, and 6.1 and 7 in the two consultation rooms when doors were closed, and 9.1 and 13.2 when the doors were open. The transmission risk in the lung function laboratory at an ACH of about 5 was calculated as between 0.1% after a 15-minute exposure to rhinovirus and 3.6% after a 45-minute exposure to influenza. Transmission risks were highest for influenza, followed by tuberculosis and rhinovirus. The risk decreased rapidly as an exponential dilution function and with an increasing air exchange rate. It is interesting to see that with the ventilation turned off, the infection risk for influenza was found to be close to 50% after 15 minutes of exposure time, and nearly 100% after 45 minutes. Because of the high ACH in the isolation room, a 99.9% reduction in infectious quanta of influenza virus (worst case scenario) was reached after 18 minutes. Hence, the risk for the healthy person entering the room for 30 minutes or up to 8 hours immediately after the infectious patient had left the room was the same 0.3%. The risk in the consultation room depended on the duration of the infectious patient’s consultation and the duration of the healthy person’s exposure time. If the room was previously occupied for 15 minutes by the infectious person, the risk for the healthy person was 3.6% after 15 minutes and 8.8% after 120 minutes in the consultation room. If the previous occupation by the infectious patient was 120 minutes, then the risk for the healthy individual rose to 8.8% and 20.7%, respectively. Knibbs et al. (2011) conclude that ACH measurements in combination with modeling are a useful means to assess on a case-by-case basis the suitability of room ventilation for preventing airborne disease transmission.