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FEATURE IN FOCUS

Latest situation of melioidosis in Hong Kong

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Melioidosis is an infectious disease caused by the bacteria *Burkholderia pseudomallei (B. pseudomallei)*. Melioidosis is prevalent in tropical and subtropical regions worldwide, primarily Southeast Asia, South Asia, Northern Australia, and some parts of the Americas.[1] The disease is also endemic in Hong Kong.

As *B. pseudomallei* survives in soil and water, the bacteria can be transmitted to humans and animals through direct contact with the contaminated soil and water (e.g. inhalation of contaminated dust or water droplets, ingestion of contaminated water, ingestion of soil-contaminated food or direct contact with contaminated soil, especially through skin abrasions). Person-to-person transmission has been reported but it is rare.[2] The risk of exposure and infection of melioidosis varies with season and overseas studies reported that rainfall, windy conditions and tropical storms were correlated with the increased number of confirmed melioidosis cases[3,4,5]. *B. pseudomallei* buried in the soil and muddy water may be exposed to the ground after typhoons or storms, and the bacteria would spread more easily with strong winds and storms. As such, human infection cases are more common following extreme weather conditions.

The incubation period of melioidosis varies from one day to a few years, but usually from two to four weeks. The clinical manifestations of melioidosis infection are variable and patients may present with localized infection (such as cutaneous abscess), pneumonia, meningoencephalitis, sepsis, or chronic suppurative infection. Depending on the site of infection, common symptoms include fever, headache, localized pain or swelling, ulceration, chest pain, cough, haemoptysis, and swelling of regional lymph nodes. Individuals with underlying diseases are at increased risk for developing melioidosis, such as patients with diabetes, lung disease, liver disease, renal disease, cancer, or immunosuppression. A definitive diagnosis of melioidosis is made by isolating *B. pseudomallei* from clinical specimens. Melioidosis can be treated with antibiotics. Some chronic infection cases may need long-term treatment. The mortality rate ranges from around 40-75%.

Local situation

In Hong Kong, the first human case was reported in 1983[6] and another five cases identified among immunocompromised patients were reported in 1984[7]. Another local study identified 61 culture-confirmed hospitalized cases of melioidosis during 1998 to 2017[8]. According to the Hospital Authority records, the annual number of melioidosis ranged from 3 to 17 during 2017 to 2021. Between August and November 2022, an upsurge of melioidosis cases, mainly involving patients residing in Sham Shui Po was reported to the Centre for Health Protection (CHP) of the Department of Health. In order to enhance surveillance capability and facilitate early intervention and prevention, melioidosis was included in the list of statutorily notifiable infectious diseases on November 11, 2022[9].

From August to December 2022, a total number of 37 cases were recorded, with 30 of them residing in Sham Shui Po. These 30 cases had an age range of 42 to 94 years (median: 71). Twenty-one (70.0%) of them were male. All had chronic diseases and 18 (60.0%) of them had diabetes mellitus. The main clinical presentation included pneumonia (20; 66.7%) and sepsis (10; 33.3%). Nine (30%) patients passed away due to melioidosis. Their residences clustered within a diameter of about one kilometer. Whole genome sequencing of clinical samples revealed that 28 cases (93.3%) had the same sequence type (ST-1996).

Environmental samples were collected from residence of the cases residing in Sham Shui Po and their vicinity, nearby construction sites

and fresh water service reservoirs (FWSRs) supplying Sham Shui Po. Some environmental samples collected from residence of a case, soil from a nearby construction site as well as soils from the rooftop or surface swabs of air vents related to FWSRs were tested positive by PCR. All water samples collected from cases' residences and FWSRs supplying Sham Shui Po were tested negative indicating that the water supply system was not contaminated. Although the water quality fully complied with Hong Kong drinking water standards, for prudence sake, the Water Supplies Department implemented additional measures, including increasing the residual chlorine level and installing filters at the air vents of the reservoirs upon CHP's advice. With the above efforts and increased awareness among the public, a notable drop in the number of melioidosis cases was observed with only 17 cases recorded in 2023 and only one case was recorded in 2024 (as of February 19, 2024) (Figure 1). All these 18 cases were Chinese adults (100.0%) with ages ranging from 47 to 94 years (median: 67.5 years), involving 12 (66.7%) males and six (33.3%) females. All cases were locally acquired infections without family clustering identified. Among them, there were five deaths (27.8%) recorded (three cases died of melioidosis) and all five fatal cases had pre-existing chronic diseases or immunodeficiency conditions. In terms of residential district distribution, the top three residing districts were Sham Shui Po (six cases), Eastern (four cases), Islands (two cases) and Wong Tai Sin (two cases).

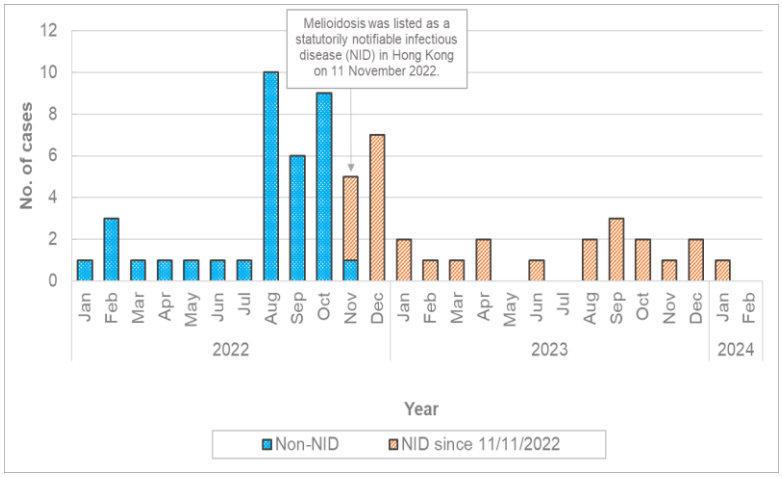

Figure 1 – Confirmed melioidosis cases in Hong Kong since 2022 (as of February 19, 2024).

Tips for prevention of melioidosis infection

To reduce the risk of melioidosis infection, members of the public should implement the following preventive measures, especially individuals with underlying diseases:

- Avoid contact with contaminated soil;
- Wear appropriate protective clothing or footwear when participating in activities with possible contact with soil or water, e.g. use gloves and wear boots. High-risk individuals may consider wearing a surgical mask for additional protection;
- Wash or shower after exposure to contaminated water or soil;
- Always clean any wounds as soon as possible and cover any cuts or grazes with waterproof dressings; and
- Observe food hygiene and only drink boiled or well-treated water.

Members of the public are also reminded to stay indoors during typhoons and storms, avoid travelling to areas with potential flooding, and not wade or contact with muddy water and soil. Additionally, high-risk individuals should avoid paths near stormwater drains where aerosols may be generated from contaminated water. When there is an inevitable exposure, high-risk individuals are highly advised to wear a surgical mask, gloves and boots.

The CHP will continue to monitor local situation of meliodosis and provide update to the members of the public timely for better preparation on precautionary works.

References

[1] CDC Yellow Book 2024: Melioidosis. Centers for Disease Control and Prevention. Available at: https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/melioidosis
[2] Melioidosis. Centre for Health Protection of the Department of Health. Available at: https://www.chp.gov.hk/en/healthtopics/content/24/101110.html
[3] Mu JJ, Cheng PY, Chen YS, Chen PS, Chen YL. The occurrence of melioidosis is related to different climatic conditions in distinct topographical areas of Taiwan. Epidemiol Infect. 2014 Feb;142(2):415-23.
[4] Bulterys PL, Bulterys MA, Phommasone K, Luangraj M, Mayxay M, Kloprogge S, Miliya T, Vongsouvath M, Newton PN, Phetsouvanh R, French CT, Miller JF, Turner P, Dance DAB. Climatic drivers of melioidosis in Laos and Cambodia: a 16-year case series analysis. Lancet Planet Health. 2018 Aug;2(8):e334-e343.
[5] Merritt AJ, Inglis TJJ. The Role of Climate in the Epidemiology of Melioidosis. Curr Trop Med Rep. 2017;4(4):185-191.
[6] So SY, Chau PY, Leung YK, Lam WK, Yu DY. Successful treatment of melioidosis caused by a multiresistant strain in an immunocompromised host with third generation cephalosporins. Am Rev Respir Dis. 1983 May;127(5):650-4.
[7] So SY, Chau PY, Leung YK, Lam WK. First report of septicaemic melioidosis in Hong Kong. Trans R Soc Trop Med Hyg. 1984;78(4):456-9.
[8] Lui G, Tam A, Tso EYK, Wu AKL, Zee J, Choi KW, Lam W, Chan MC, Ting WM, Hung IFN. Melioidosis in Hong Kong. Trop Med Infect Dis. 2018 Aug 25;3(3):91.
[9] Press Release: Government gazettes inclusion of melioidosis as statutorily notifiable infectious disease under Prevention and Control of Disease Ordinance. The Government of the Hong Kong Administrative Region. Available at: https://www.info.gov.hk/gia/general/202211/11/P2022111100374.htm.

Review of Legionnaires' Disease in Hong Kong in 2023

Reported by Dr Katie LAI, Medical and Health Officer, Respiratory Disease Section, Surveillance Division, Communicable Disease Branch, CHP

Legionnaires' disease (LD) is primarily caused by the *Legionella* bacteria, which are commonly found in aqueous environment and grow well at warmer temperatures (20°C to 45°C). The Centre for Health Protection (CHP) of the Department of Health recorded a cumulative total of 121 LD cases in 2023, resulting in an incidence rate of 1.61 per 100 000 population. The total number of cases reported in 2023 was slightly higher than that in the previous five years (Figure 1). In terms of monthly numbers reported in 2023, more were recorded in July (21 cases) and September (23 cases) (Figure 2).

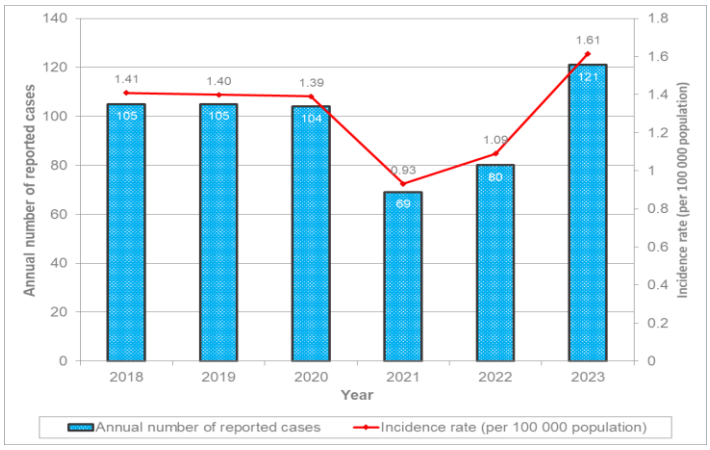

Figure 1 – Annual number and incidence rate of reported LD cases, 2018 – 2023.

Clinical and epidemiological characteristics

Among the 121 LD cases recorded, their ages ranged between 27 and 95 years (median: 70 years), with the majority (114, 94.2%) affecting persons aged 50 years or older. Males were more affected (male-to-female ratio of 4.8:1), and 87.6% (106 cases) had a history of at least one underlying medical condition. In terms of smoking history, amongst the 102 cases with relevant information available, 27 (26.5%) were current smokers and 25 (24.5%) were ex-smokers.

The common presenting symptoms included fever (85.1%), cough (66.1%), and shortness of breath (50.4%). All cases developed pneumonia and required hospitalisation. Twenty-nine cases (24.0%) required intensive care and 12 out of the 121 cases passed away, accounting for a case fatality rate of 9.9%. As to laboratory diagnosis, 80 (66.1%) and 40 (33.1%) cases were initially diagnosed as LD by urinary antigen test (UAT) and polymerase chain reaction (PCR) of respiratory specimens respectively, while the remaining one case was confirmed by sputum culture.

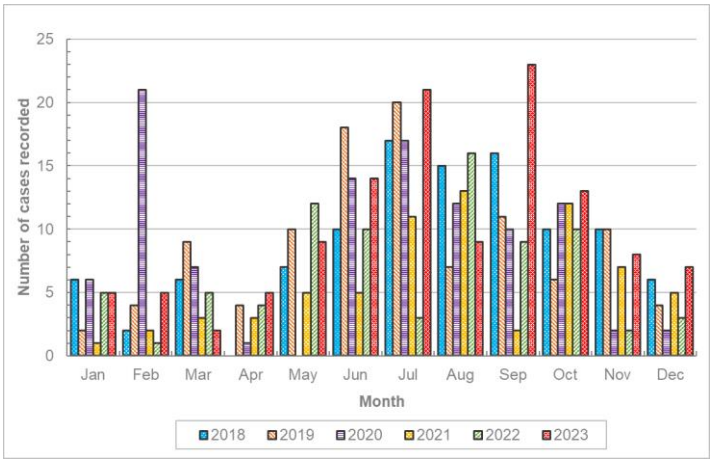

Figure 2 – Monthly number of reported LD cases, 2018 – 2023.

Upon epidemiological investigations, the majority of cases (110, 90.9%) reported in 2023 were classified as locally acquired infections. The residential places of these locally acquired cases were distributed in various districts in Hong Kong (Figure 3). Environmental investigation for those who resided geographically in close proximity did not identify common sources of infection in the community. There were four definite nosocomial cases and one possible nosocomial case with positive environmental samples collected from the water systems in wards or the water tanks of the hospitals. Three out of the five cases had the same sequence-based typing among their respiratory specimens and the environmental isolates. The respective hospitals carried out disinfection of the water supply systems, and no further cases were identified afterwards. Four cases were residential care home residents (three cases involved residents of residential care homes for the elderly (RCHE) while the remaining case was a resident of a residential care home for persons with disabilities (RCHD)). Positive environmental samples were detected in the water systems in one RCHE and the RCHD, while control measures were reinforced in all the residential care homes concerned and no further cases were identified thereafter.

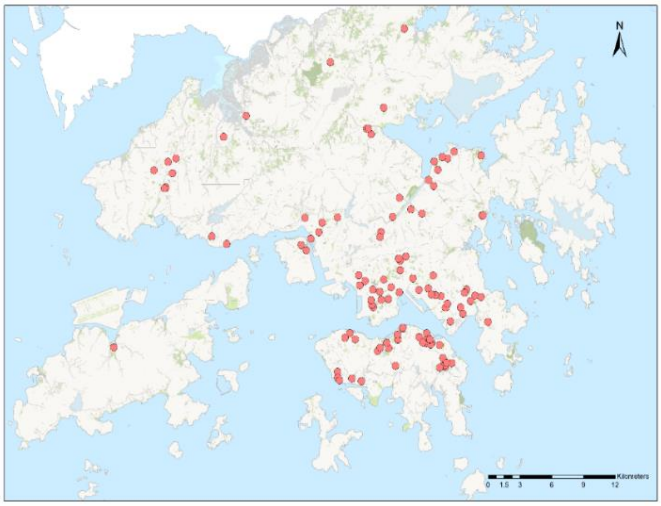

Figure 3 – Geographic distribution of the residential places of the 110 locally acquired LD cases (Source: Communicable Disease Information System).

Discussion

The number of LD cases recorded in 2023 was slightly higher than that recorded in the previous five years. The distribution of cases by month was similar to previous years in that more cases occurred between June and October, with peaks recorded in July and September 2023. Most of the reported cases were sporadic without epidemiological linkage. As *Legionella* bacteria are ubiquitous in aqueous environments including man-made water systems, people may acquire LD through breathing in contaminated droplets or mist generated by artificial water systems, as well as when handling garden soils, compost and potting mixes, etc. Other than the above-mentioned nosocomial cases, no definite sources of infection were identified through epidemiological and environmental investigations for other cases in the year.

Studies suggest that LD risk increases in warmer weather.[1,2,3] According to the Hong Kong Observatory's information, year 2023 was the second warmest years on record for Hong Kong since 1885, with the annual mean temperature reaching 24.5°C, 1.0°C above the 1991 to 2020 normal. In particular, Hong Kong experienced the hottest summer on record from June to August 2023, with a record-breaking high mean temperature of 29.7°C, while the mean maximum temperature of 32.4°C and the mean minimum temperature of 27.6°C were both the second highest on record for the same period.[4]

A rising trend in the incidence of LD was also observed in some overseas countries and regions. For example, the European Center for Disease Prevention and Control reported that, the Europe Union/European Economic Area witnessed the highest annual notification rate of LD in 2021, with 2.4 cases per 100 000 population.[5] The cause of the increased reported incidence observed during that period in Europe remains unclear. Other than climates, changes in testing policies and surveillance systems, an ageing population, etc. can be possible factors.[6]

To prevent LD, it is important to operate and maintain properly designed man-made water systems to prevent LD. Members of the public, especially immunocompromised persons, should adopt preventive measures to decrease the risk of LD infection. More information on LD is available on the CHP website (https://www.chp.gov.hk/en/view_content/24307.html).

References

[1] Pampaka D, Gómez-Barroso D, López-Perea N, et al. Meteorological conditions and Legionnaires' disease sporadic cases-a systematic review. Environ Res. 2022;214(Pt 4):114080.
[2] Simmering JE, Polgreen LA, Hornick DB, et al. Weather-Dependent Risk for Legionnaires' Disease, United States. Emerg Infect Dis. 2017;23(11):1843-1851.
[3] Karagiannis I, Brandsema P, VAN DER Sande M. Warm, wet weather associated with increased Legionnaires' disease incidence in The Netherlands. Epidemiol Infect. 2009;137(2):181-187.
[4] Press Release: 2023 was second warmest year on record for Hong Kong. Available at: https://www.info.gov.hk/gia/general/202401/08/P2024010800465.htm
[5] Disease Outbreak News: Legionellosis – Poland. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON487
[6] European Centre for Disease Prevention and Control. Legionnaires' disease. In: ECDC. Annual Epidemiological Report for 2021. Stockholm: ECDC; 2023.

NEWS IN BRIEF

A local sporadic confirmed case of listeriosis

On January 19, 2024, the Centre for Health Protection (CHP) of the Department of Health recorded a case of listeriosis affecting a 71-year-old man with lung cancer. He presented with fever and cough since January 8 and was admitted to a public hospital on January 15. His blood specimen collected on January 16 grew *Listeria monocytogenes*. He was treated with antibiotics but died of unrelated cause on February 10. He had no travel history during incubation period. He had no high risk exposure. His household contact remained asymptomatic.

A sporadic imported case of brucellosis

On February 2, 2024, CHP recorded a sporadic imported case of brucellosis affecting a 78-year-old woman with underlying disease and residing in Sha Tin. She presented with painful swelling over her pacemaker site at chest wall in mid-December 2023. She sought medical attention at a private hospital and was subsequently admitted to a public hospital on January 19, 2024. Her blood and pus specimens were both cultured positive for *Brucella melitensis*. The clinical diagnosis was brucellosis and she was treated with antibiotics and chest wall wound debridement. Her condition remained stable and was discharged on February 17, 2024. She consumed undercooked lamb while travelling in New Zealand during the incubation period. Other relatives who consumed the same meal were so far asymptomatic. No other high risk exposures were identified.