Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

Nosocomial human parainfluenza virus type 3 outbreak in immunocompromised patients, and possible lessons from the SARS-CoV-2 pandemic

Sir,

We read with great interest the manuscript by Iglói *et al.* on an investigation of a human parainfluenza virus-3 (HPIV-3) outbreak in a haematology ward. This outbreak was controlled by implementing several measures, including systematic screening of all newly admitted patients for HPIV-3, the use of surgical masks by personnel and visitors, and the use of masks by patients when visiting the outpatient department or when moving through the hospital [1].

HPIVs represent a common cause of a wide range of respiratory illnesses, and may also cause prolonged asymptomatic infection with virus shedding, challenging symptom-based infection control measures [2]. In immunocompromised patients, particularly patients with haematological malignancies (HMs) and recipients of haematopoietic cell transplantation (HCT), infection may progress to the lower respiratory tract (in up to 43% of HCT patients) and cause severe lower respiratory tract infection (LRTI) with a mortality rate of 37–50% [2]. Transmission of HPIV occurs mainly via droplets, close personal contact and fomites [1,2]. HPIV infections spread with serotype-specific seasonal variations. HPIV-3 is the most commonly isolated serotype in symptomatic disease, and causes seasonal outbreaks in the spring, usually following influenza epidemics, and may cause a second smaller epidemic in the autumn in years when HPIV-1 is not actively circulating [2]. Nosocomial outbreaks often involve haematology wards. Outpatient facilities and waiting areas seem to play a critical role because of transmission within outpatients and subsequent nosocomial transmission within the attached ward [2,3].

In April and May 2017, a cluster of HPIV-3 infections involving at least 17 inpatients (with five nosocomial infections) occurred at University Hospital Basel, a 700-bed tertiary care hospital. At this institution, high-risk haematology patients (e.g. allogenic HCT, acute leukaemia) are admitted to single-bed rooms on a high-efficiency-particulate-air-filtered 15-bed ward, and less immunosuppressed haematology patients are admitted to a normal internal medicine/haematology ward. Clinical assessment of vulnerable patients with respiratory symptoms and/or fever routinely includes panel polymerase chain reaction (PCR) testing for 20 respiratory pathogens from a nasopharyngeal swab (Biofire Respiratory Panel, bioMérieux, Marcy l'Etoile, France). In order to better understand the dynamics of nosocomial spread and clinical manifestations of HPIV-3 infections, we retrospectively reviewed the results of all respiratory panel PCR tests from nasopharyngeal swabs performed on 883 patients at the study hospital over an 8-month period (November 2016–June 2017) surrounding the outbreak. We compared clinical manifestations and outcomes of patients infected with HPIV-3 (cases) and patients infected with rhino-/enteroviruses (controls), which are the most common causes of respiratory virus infections in both immunocompetent and immunocompromised individuals [4]. Cases and controls were matched for age, gender, immunosuppressive treatment and HCT. During the study period, we identified 39 patients with HPIV-3 infection [21 (54%) inpatients and 18 (46%) outpatients], of which 12 (31%) were from the haematology outpatient clinic, and 55 patients with rhino- or enterovirus infection. The most common underlying predisposing conditions in patients with HPIV-3 infection and patients with rhino-/enterovirus infection were HM (51% and 64% of patients, respectively), HCT (44% and 42%, respectively), chronic lung disease (21% and 14%, respectively) and renal transplantation (8% and 3%, respectively). In the matched cohort (39 patients with HPIV-3 infection and 36 patients with rhino-/enterovirus infection), LRTI was present in 64% of patients with HPIV-3 infection and 47% of patients with rhino-/enterovirus infection. Fifteen percent of patients with HPIV-3 infection and 22% of patients with rhino-/enterovirus infection had no symptoms of respiratory tract infection. All-cause in-hospital mortality was 5.1% among patients with HPIV-3 infection and 2.8% among patients with rhino-/enterovirus infection. HPIV-3 infections occurred throughout the study period and during the following period from July 2017 to April 2022, with a second peak in April–May 2019 (without evidence of increased nosocomial transmission). However, during the peaks of the severe acute respiratory syndrome coronavirus-2 pandemic (with strict protective measures in place), the incidence of HPIV-3 infection was markedly lower, and this increased again after reducing protective measures in both the hospital setting and the general population (Figure 1).

We found that during and around a nosocomial HPIV-3 outbreak, 46% of patients with HPIV-3 infection were seen in outpatient clinics. This may indicate a crucial role of outpatient facilities for the nosocomial spread of HPIV-3. The reduced incidence of HPIV-3 infection during the peaks of the coronavirus disease 2019 waves suggests that protective

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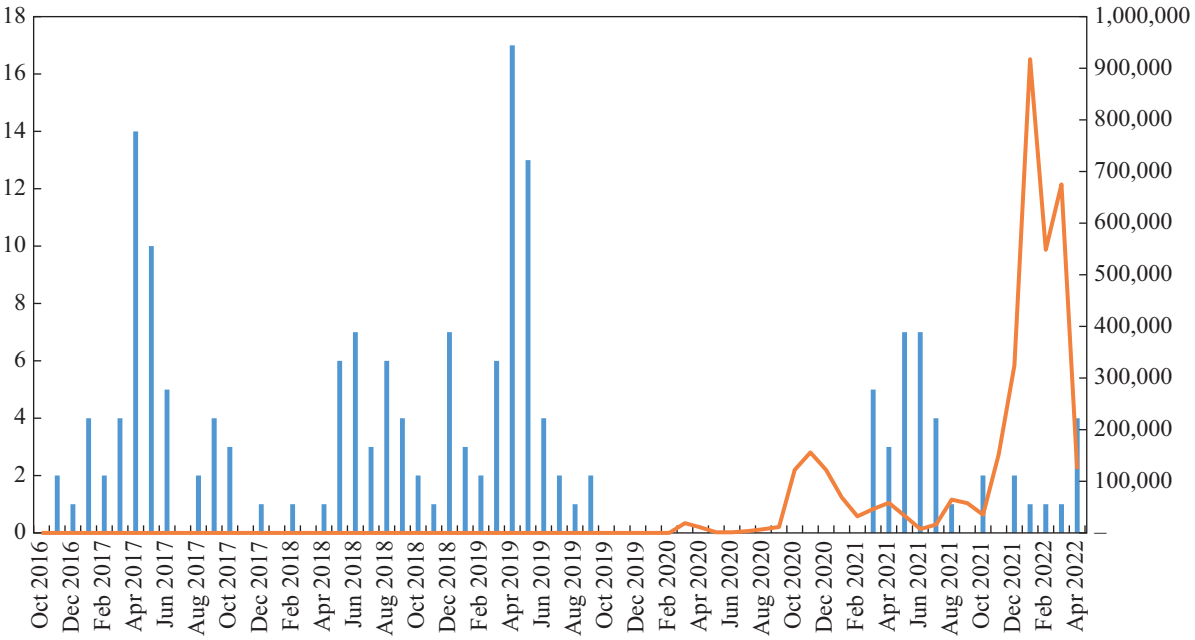

Figure 1. Cases of human parainfluenza virus-3 infection at University Hospital Basel (blue bars, left scale) and cases of coronavirus disease 2019 (COVID-19) in Switzerland (orange line, right scale) from October 2016 to April 2022. Mandatory protective measures such as social distancing, use of masks and restricted hospital access for visitors were implemented for the general population and in hospitals at the beginning of the COVID-19 pandemic in Switzerland (February 2020). These measures were reduced between and after the waves of the COVID-19 pandemic. Source of COVID-19 data: Swiss Federal Office of Public Health (https://opendata.swiss/de/dataset/covid-19-schweiz/resource/3a3ce4d9-94d8-42bf-966a-5088b0083bae).

measures, such as social distancing and universal mask use, may also reduce HPIV-3 infection in both the population at large and in the hospital setting. In addition, our results indicate that HPIV-3 infection is associated with more severe disease compared with rhino-/enterovirus infection in hospitalized patients.

The transmission of respiratory pathogens occurs along a continuum (contact—droplets—aerosols), depending on several factors [5,6]. It has been shown that universal surgical mask use (by staff, visitors and patients) reduces respiratory viral infections, particularly HPIV-3 infection, on HCT units [7,8]. As such, universal mask use should be considered on all wards and in all outpatient facilities [3] caring for patients at risk for severe disease following infection with respiratory viruses.

Conflict of interest statement
None declared.

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