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# Florona: An emerging threat posing alarming risks to global public health and possible containment measures

*Dear Editor,*

The World Health Organization (WHO) classified the Omicron (B.1.1.529) variant as the fifth variant of concern (VOC) on November 26, 2021. The Omicron variant comprises more than fifty mutations, including 30 Spike protein (S-protein) modifications. The emergence of Omicron (B.1.1.529), a highly modified strain of SARS-CoV-2, has been viewed as a crucial concern among global immunization programmes [1]. Amid the emergence of the Omicron variant, a case of "Florona" has been diagnosed in Israel. It is critical to remember that the Florona is not a novel variant; instead, it is a COVID-19 and influenza co-infection. According to a recent research, both the influenza virus and SARS-CoV-2 enter the body simultaneously and complement each other, resulting in a severe form of the disease [2]. With the introduction of Omicron and Delta variants, there has been an upsurge in the incidence of co-infections recently. It is worth noting that individuals co-infected with influenza and COVID-19 showed higher expression of ACE2 receptors and increased cytokine production [1]. Influenza and COVID-19 co-infection can considerably increase the mortality rate, especially in high-risk categories like the elderly and immunocompromised people. As a result, the coexistence of influenza and coronavirus at the same time has piqued researchers' curiosity.

The influenza virus might aggravate the challenges and hazards posed by the coronavirus pandemic to public health, notably during the winter season and among those at risk of severe illness and hospitalization. As a result, the co-infection of these viruses might significantly impact morbidity and mortality rates. In Israel, the number of cases of influenza has grown in recent weeks [2]. Recently, influenza co-infection has been reported in more than 20% of SARS-CoV-2 positive deceased patients [3]. Centers for Disease Control and Prevention and the Israeli Ministry of Health reported that Israel is experiencing a wave of influenza infection, with 1849 people treated in Israeli hospitals [4].

A combination of COVID-19 and the flu can result in detrimental effects, including pneumonia, acute respiratory distress syndrome (ARDS), hyper-increased inflammatory response, stroke, and even death [2]. Florona can lead to a severe failure of the immune system as two viruses are invading the human body simultaneously [5]. Recently, the pathogenic and immunological consequences of SARS-CoV-2 and influenza co-infection were evaluated via using the K18-hACE2 transgenic mouse model. Co-infection increased immune cell infiltration and inflammatory cytokine and chemokines levels in bronchoalveolar lavage fluid (BALF), leading to severe pneumonia and lung damage [6]. Higher cytokine and chemokine levels have been proposed as a critical reason for the elevated mortality rate in COVID-19-infected individuals. As a result, co-infections can significantly increase hospitalization and, as a consequence, death. In addition, co-infections caused considerable lymphopenia in the peripheral blood. In addition, reduced levels of IgG, nABs (neutralizing antibodies), and T cells have been reported due to co-infection. Furthermore, increased SARS-CoV-2 viral load and significantly severe lung damage were seen in mice coinfected with IAV [7]. In ferrets, co-infection with influenza and SARS-CoV-2 extended clinical symptoms and lung damage triggered by SARS-CoV-2 infection [8].

Given the catastrophic repercussions of Florona, it is critical to concentrate on mitigation techniques to prevent the spread of viral agents, particularly as the world faces the threat of the advent of the Omicron variant and its sublineages. Several preventive measures such as physical measures, vaccinations via dual vaccines, and updated diagnostic procedures are being employed to contain the severity of COVID-19 due to the co-infection of both viral agents. Non-pharmaceutical interventions like social isolation, travel and movement restrictions, and hygiene measures, are largely believed to have reduced influenza circulation. SARS-CoV-2 and Influenza virus spread in corresponding ways [2,3]. They can spread among persons close to one another (within six feet or 2 m). Hence, physical measures can play a significant role in controlling the spread of influenza amid the circulation of VOCs and their sublineages among the population [5]. The viruses are transferred by airborne droplets or aerosols released when people talk, sneeze, or cough. These droplets can fall into someone's mouth or nose, or they can be inhaled. If a person contacts a surface with one of the viruses on it and then approaches their lips, nose, or eyes, the virus can be transmitted [2]. Hence, people should also follow preventive measures such as keeping at least three feet or one-meter distance from others. Additionally it is essential to keep opening windows and doors to keep rooms well ventilated, and washing their hands frequently [2,5]. Moreover, wearing a well-fitted mask when social distancing is not feasible. Hence, people at high risk should avoid crowded and poorly ventilated places.

In addition to physical precautions, WHO claimed that the most effective way to avoid the disastrous consequences of influenza and COVID-19 co-infection is to vaccinate as many people as possible with both influenza and COVID vaccinations [3,8]. Israel's national health providers started providing the fourth booster dose of COVID-19 vaccine to people with impaired immunological conditions. Today approved booster shots for immunocompromised patients due to the Omicron infection wave, if it has been at least four months since their third dose, and approved immunizations for elderly patients. The government did so because of concern about epidemics such as facilities and the risk to the health and lives of inhabitants [8,9]. Furthermore, competent diagnostic methods must be used to screen the co-infection. Likewise, each country's government should enhance flu vaccine coverage to reduce influenza virus transmission during the advent of VOCs.

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## Data statement

All data are available in the manuscript.

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## Declaration of competing interest

Authors declare that they have no conflicts of interest.

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