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CORONAVIRUS DISEASE 2019 UPDATE (04): SELECTED COUNTRIES/REGIONS, JN.1 VIROLOGICAL CHARACTERISTICS, SEVERITY, OMICRON BA.4.1 DETECTED IN DOGS
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[1] Selected countries/regions
[A] India: Mumbai records 1st COVID-19 death this year
Date: Mon 8 Jan 2024
Source: The Indian Express [edited]
https://indianexpress.com/article/cities/mumbai/first-covid-death-in-mumbai-this-year-9098316/

Mumbai reported its 1st COVID-19 fatality of the year [2024] with a 52-year-old man, who had tested positive for the virus, succumbing on 5 Jan 2024. The previous COVID-19 death was recorded on 9 Aug 2023.

The deceased, a resident of M West ward, was admitted to a government hospital on 4 Jan 2024, with symptoms such as fever, cough and breathlessness for 5 days. The patient had tested positive for COVID and, within 24 hours of admission, passed away, with the cause of death attributed to respiratory tract infection (LRTI) with sepsis and septic shock, according to an official from the civic health department.

Meanwhile, the state reported 154 new COVID cases, with 21 cases in Mumbai, in the last 24 hours. Another COVID death was recorded in Nagpur.

The state recorded a recovery rate of 98.17%, a positivity rate of 1.11% and a case fatality rate of 1.81%. Maharashtra has 139 patients infected with the JN.1 variant.

On the JN.1 variant, Dr Rajesh Karyakarte, head of the BJ Medical College Microbiology Department and a member of the state COVID-19 task force, said, "While cases are increasing, hospitalisations and deaths remain low. However, the variant is highly transmissible, and the recent New Year celebrations without adhering to COVID-appropriate behaviour have contributed to increased transmission and cases," he said.

[Byline: Rupsa Chakraborty]

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[Although rare, severe complications arising from SARS-CoV-2 infections can still arise. As time passes between individual exposure to SARS-CoV-2 antigens through infection or vaccination, individual immunity against SARS-CoV-2 can wane and newer variants may also gain mutations that may increase their transmissibility, pathogenicity, and ability to escape individual and population immunity (see item 3 in this update). It is therefore important for individuals to be aware of public health risks from respiratory viruses such as SARS-CoV-2 in surrounding locations and take necessary precautions to reduce risk of getting infected and passing on infections to others, where possible. - Mod.LWW]

[B] Hong Kong: Double warning over COVID, flu
Date: Fri 5 Jan 2024
Source: The Standard [edited]
https://www.thestandard.com.hk/section-news/section/11/259288/Double-warning-over-Covid-flu

Hong Kong is expected to enter the flu peak season next week even as COVID spreads through a new subvariant -- JN.1 -- which is forecast to become the dominant strain.

Chuang Shuk-kwan, head of the Centre for Health Protection's Communicable Disease Branch, said the flu rate had reached a high of 8.49% lately.

But it is difficult to predict how long the peak will last as the lifting of the mask mandate and Hongkongers' frequent overseas travel may affect the duration and severity of the season.

"The usual duration of the season in the past was 8 weeks to 12 weeks," she said.

"So it's difficult to predict the exact duration of the season and the severity."

She urged people to get vaccinated against the flu as soon as possible and to wear masks in crowded places and on public transport.

"Those who are not feeling well or those who have contacts with sick people or have respiratory diseases should wear masks," Chuang stressed.

"People should also wear masks when visiting high-risk places, including elderly homes and hospitals, as well as crowded indoor places with poor ventilation."

She said Hong Kong is seeing an active spread of COVID, as viral loads collected in sewage samples and the number of COVID patients have been on the rise.

Around 60% of COVID patients in Hong Kong have contracted the JN.1 omicron variant, which has been spreading quickly around the world.

And as the proportion of Hong Kong patients carrying the JN.1 strain is increasing Chuang expects it will replace XBB to become the new dominant strain in Hong Kong.

"The proportion of cases with the JN.1 strain around the world has increased from 3% in early November [2023] to 27% now, and more patients are contracting the subvariant," she said.

"Fortunately, there is no evidence suggesting the JN.1 strain can lead to more serious illness compared to other variants, and it is unlikely to cause a serious public health crisis. The existing vaccine targeting the XBB variant is also effective against the JN.1 strain."

The head of the CHP's Emergency Response and Program Management Branch, Albert Au Ka-wing, said the administration has procured 200 000 doses of vaccine targeting the XBB variant and administered around 20 000 jabs for people aged 65 and above and care home residents as of Wednesday [3 Jan 2024].

He said authorities are planning to expand the vaccination program, and for people aged 50 to 64, patients with chronic diseases or impaired immunity, pregnant women and medics to receive the new vaccine.

Au said most Hongkongers have been fully vaccinated by getting 3 jabs. But only 30% of children aged 6 months to 3 years old are fully vaccinated and one-fourth of the elderly aged 80 or above have received 4 jabs. So he urged them to get booster shots as soon as possible.

The number of serious illnesses and deaths following COVID infections remains stable, but Hong Kong has seen 2 children in serious condition after they contracted the coronavirus.

Hospital Authority senior executive Larry Lee Lap-yip said one case involved a 4-year-old boy going to Australia during the incubation period then testing positive for COVID after returning on New Year's Day.

The boy had a fever and difficulties breathing before being diagnosed with pneumonia at Tuen Mun Hospital. He had been in serious condition but became stable after treatment.

A 20-month-old boy with no travel history started developing a fever last Friday [29 Dec 2023] and tested COVID positive. He was sent to Prince of Wales Hospital and was found to suffer from croup -- a type of respiratory infection that commonly occurs in children aged 6 months to 5 years. He is in stable condition.

Lee said the emergency rooms at public hospitals have been receiving increasing numbers of patients since late last month [December 2023], with occupancy rates of medical wards surpassing 115%.

The authority has increased manpower and hospital beds and deployed geriatric doctors to take care of senior patients in emergency rooms, he said.

[Byline: Wallis Wang]

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[C] Spain: Spanish holiday regions reintroduce COVID-mask rules after seeing surge in cases
Date: Fri 5 Jan 2024
Source: The Daily Mail (Online) [edited]
https://www.dailymail.co.uk/news/article-12929711/Spanish-holiday-region-reintroduces-Covid-mask-rules-seeing-surge-cases.html

The COVID and flu epidemic in Spain is becoming so bad that a number of holiday regions are reintroducing the obligatory mask-wearing rule in certain cases.

Health authorities across the country are reporting saturated hospitals and health centres, with patients once again lying in corridors or waiting hours for treatment.

Family doctors are also calling for the mandatory use of masks in health centres and hospitals across the whole of Spain, saying the winter surge of COVID and flu is getting out of control.

The Spanish government hasn't made any announcement about the return of obligatory mask wearing but regions such as Valencia -- where tourist hotspots Benidorm and Alicante are located -- are already imposing their own rules again.

Valencia's health department has today [5 Jan 2024] implemented the mandatory use of masks in health centres due to the rise in respiratory infections.

This preventive measure is considered relevant given the incidence in the Valencian community, with a rate of 1501 cases per 100 000 inhabitants.

The objective is to stop infections and protect vulnerable people.

The department is also relaying the message that health centres will vaccinate against flu and COVID-19 starting next Monday [8 Jan 2024] without the need for an appointment.

From today [5 Jan 2024], it will be mandatory to wear a mask when entering health centres and hospitals throughout the Valencian community.

The Ministry of Health established the mask protocol due to the spike in flu cases and respiratory infections in recent weeks.

The last weekly report for influenza, COVID-19 and other respiratory viruses in 2023 marked a global rate of acute respiratory infection in primary care of 908.6 cases per 100 000 inhabitants, when the previous week the figure was 806; and in general at all levels of care of 1501 cases per 100 000 inhabitants

The Department of Health has sent the health departments of 3 provinces an instruction from the General Directorate of Public Health that establishes the mandatory use of masks in health and social health centres as a preventive measure in the face of the resurgence of respiratory virus infection.

Valencia says its health services are at the point of collapse due to the surge in COVID and flu cases after Christmas and is having to send patients to provide hospitals in order to cope.

The wave is expected to peak in the 3rd week of January [2024].

There are hospitals in the Valencia province at 96% occupancy and family doctors are seeing 15 off-schedule patients a day due to these infections, with influenza A in 7 out of 10 cases.

The Spanish Society for Family Doctors is calling for obligatory mask wearing in hospitals and medical centres across Spain to stop the spread of flu and COVID.

[Byline: Rita Sobot]

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[2] Virological characteristics of the SARS-CoV-2 JN.1 variant
Date: Wed 3 Jan 2024
Source: The Lancet Infectious Diseases [edited]
https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(23)00813-7/fulltext

Citation: Kaku Y, Okumura K, Padilla-Blanco M, Kosugi Y, Uriu K, Hinay AA Jr, Chen L, Plianchaisuk A, Kobiyama K, Ishii KJ; Genotype to Phenotype Japan (G2P-Japan) Consortium; Zahradnik J, Ito J, Sato K. Virological characteristics of the SARS-CoV-2 JN.1 variant. Lancet Infectious Diseases. 2024 Jan 3:S1473-3099(23)00813-7.

The SARS-CoV-2 BA.2.86 lineage, 1st identified in August 2023, is phylogenetically distinct from the current circulating SARS-CoV-2 omicron XBB lineages, including EG.5.1 and HK.3. Compared with XBB and BA.2, BA.2.86 carries more than 30 mutations in the spike protein, indicating a high potential for immune evasion. BA.2.86 has evolved and its descendant, JN.1 (BA.2.86.1.1), emerged in late 2023. JN.1 harbours Leu455Ser and 3 mutations in non-spike proteins. Spike protein mutation Leu455Ser is a hallmark mutation of JN.1: we have recently shown that HK.3 and other flip variants carry Leu455Phe, which contributes to increased transmissibility and immune escape ability compared with the parental EG.5.1 variant. Here, we investigated the virological properties of JN.1. We estimated the relative effective reproductive number of JN.1 using genomic surveillance data from France, the UK, and Spain, where more than 25 sequences of JN.1 have been reported, using a Bayesian multinomial logistic model. The reproductive number of JN.1 in these 3 countries was higher than that of BA.2.86.1 and HK.3, one of the XBB lineages with the highest growth advantage at the end of November 2023. These results suggest that JN.1 might soon become the dominant lineage worldwide. Indeed, by the end of November 2023, JN.1 had already overtaken HK.3 in France and Spain.

The in vitro ACE2 binding assay showed that the dissociation constant value of the JN.1 receptor-binding domain (RBD) was significantly higher than that of the BA.2.86 RBD, suggesting that Leu455Ser decreases binding affinity to the human ACE2 receptor. In contrast, the pseudovirus assay showed that the infectivity of JN.1 was significantly higher than that of BA.2.86. This discrepancy could be due to the difference between monomeric RBD and trimerised whole spike protein. We then performed a neutralisation assay using rodent sera infected with BA.2.86 or immunised with BA.2.86 spike protein. In both cases, the 50% neutralisation titre (NT50) against JN.1 was similar to that against BA.2.86, suggesting that Leu455Ser does not affect the antigenicity of BA.2.86. On the other hand, the NT50 of breakthrough infection sera with XBB.1.5 and EG.5.1 against JN.1 was significantly lower than that of HK.3 (2·6-fold to 3·1-fold) and BA.2.86 (3·8-fold). Furthermore, JN.1 shows robust resistance to monovalent XBB.1.5 vaccine sera compared with BA.2.86. Taken together, these results suggest that JN.1 is one of the most immune-evading variants to date. Our results suggest that Leu455Ser contributes to increased immune evasion, which partly explains the increased reproductive number of JN.1.

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[References and links to supplementary information were removed from the text above to improve legibility. Readers interested in details should refer to the full text at https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(23)00813-7/fulltext - Mod.LWW]

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[3] New, highly mutated COVID variants 'pirola' BA.2.86 and JN.1 may cause more severe disease, new studies suggest
Date: Tue 9 Jan 2024
Source: Fortune Well [edited]
https://fortune.com/well/2024/01/08/covid-omicron-variants-pirola-ba286-jn1-more-severe-disease-lung-gi-tract-symptoms/

Highly mutated COVID variant BA.2.86 -- close ancestor of globally dominant "pirola" JN.1 -- may lead to more severe disease than other omicron variants, according to 2 new studies published Monday in the journal Cell.

In one study, researchers from Ohio State University performed a variety of experiments using a BA.2.86 pseudovirus -- a lab-created version that isn't infectious. They found that BA.2.86 can fuse to human cells more efficiently and infect cells that line the lower lung--traits that may make it more similar to initial, pre-omicron strains that were more deadly. [See full article here: https://www.cell.com/action/showPdf?pii=S0092-8674%2823%2901400-9 - Mod.LWW]

In the other study, researchers in Germany and France came to the same conclusion. "BA.2.86 has regained a trait characteristic of early SARS-CoV-2 lineages: robust lung cell entry," the authors wrote. The variant "might constitute an elevated health threat as compared to previous omicron sublineages," they added. [See full article here: https://www.cell.com/action/showPdf?pii=S0092-8674%2823%2901399-5 - Mod.LWW]

While illness caused by the initial omicron strain was typically considered milder than that caused by earlier variants, it's impossible to say definitively, experts say. That's because those sickened by omicron had generally already been infected with an earlier version of the virus, likely softening the blow. Additionally, many had been vaccinated, to the same effect.

Still, omicron had a penchant for infecting the upper airway versus the lower airway, where prior versions of the virus tended to accumulate, causing more severe disease. The new studies offer proof that this trend may very well be reversing, the authors contend. If true, it's bad news for those who hoped the virus was slowly attenuating to the equivalent of a common cold.

"We cannot ignore the evidence" that omicron may be evolving into a more severe form of itself, Dr. Shan-Lu Liu--professor and co-director of the Viruses and Emerging Pathogens Program at Ohio State University, and lead author on the 1st study -- told Fortune.

Increasing COVID hospitalizations in the U.S. and around the globe potentially bolster the argument, he added.

It's tough to tell if disease caused by COVID is again becoming more severe because waning immunity muddles matters, experts say. Antibody immunity to COVID from vaccination or prior infection -- which can reduce the severity of the disease or prevent infection altogether -- declines after 3 to 6 months. Globally, uptake of the latest COVID booster, released this past fall [2023], leaves much to be desired. In the U.S., it sits under 20%, according to the Centers for Disease Control and Prevention. In theory, the longer it's been since someone was infected with COVID or received a booster, the greater their risk for severe outcomes like hospitalization and death.

As for what the studies might mean regarding the severity of JN.1 infection, the jury is still out. But the new findings -- combined with expert speculation that JN.1 may be showing a preference for infecting the GI tract -- warrant more study into the evolving nature of the virus, according to Liu.

Another concern of his: the possibility of COVID recombining with another coronavirus in animals, then transitioning back over to humans -- throwing another viral plot twist into the pandemic's narrative.

Some experts contend that omicron -- highly mutated compared to previous strains -- originated in animals, then spilled back over into humans (as opposed to developing in a human with a long-term infection, as others contend). Regardless, animals serve as an underappreciated wild card, Liu contends. Case in point: Many of Ohio's white-tailed deer have tested positive for COVID, affording the virus an additional population in which to mutate.

Another, perhaps larger concern of Liu: the possibility that COVID recombines with another, more deadly coronavirus like SARS or MERS, which had case fatality rates around 10% and 34%, respectively. In contrast, COVID's case fatality rate, among unvaccinated Americans, sat around 1% prior to omicron, and around 0.11% after.

"Anything can happen," Liu said. "It's really hard to predict what's going to come next, but nature can do amazing things."

The bottom line when it comes to the power of animals to further evolve the virus and send another curveball flying humanity's way: "Humans, watch out."

[Byline: Erin Prater]

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[4] Chile: First detection of omicron variant BA.4.1 lineage in dogs
Date: Thu 4 Jan 2024
Source: The Veterinary Quarterly [edited]
https://pubmed.ncbi.nlm.nih.gov/38174799/

Citation: Agüero B, Berrios F, Pardo-Roa C, Ariyama N, Bennett B, Medina RA, Neira V. First detection of omicron variant BA.4.1 lineage in dogs, Chile. The Veterinary Quarterly. 2024 Dec;44(1):1-10.

Abstract

SARS-CoV-2's rapid global spread caused the declaration of COVID-19 as a pandemic in March 2020. Alongside humans, domestic dogs and cats are also susceptible to infection. However, limited reports on pet infections in Chile prompted a comprehensive study to address this knowledge gap. Between March 2021 and March 2023, the study assessed 65 pets (26 dogs and 39 cats) from 33 COVID-19+ households alongside 700 nasal swabs from animals in households with unknown COVID-19 status. RT-PCR, nasal, fecal, and environmental samples were analyzed for the virus. In COVID-19+ households, 6.06% tested positive for SARS-CoV-2, belonging to 3 dogs, indicating human-to-pet transmission. Pets from households with unknown COVID-19 status tested negative for the virus. We obtained 2 SARS-CoV-2 genomes from animals, that belonged to omicron BA.4.1 variant, marking the 1st report of pets infected with this lineage globally. Phylogenetic analysis showed these sequences clustered with human sequences collected in Chile during the same period when the BA.4.1 variant was prevalent in the country. The prevalence of SARS-CoV-2 in Chilean pets was relatively low, likely due to the country's high human vaccination rate. Our study highlights the importance of upholding and strengthening human vaccination strategies to mitigate the risk of interspecies transmission. It underscores the critical role of the One Health approach in addressing emerging zoonotic diseases, calling for further research on infection dynamics and risk factors for a comprehensive understanding.

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[ProMED map:
Worldwide: https://promedmail.org/promed-post?place=8714155,8854]

See Also

COVID-19 update (03): Israel, JN.1, new variant 20240104.8714055
COVID-19 update (02): India 20240103.8714052
COVID-19 update (01): India 20240103.8714031
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