

**To:** [REDACTED] [REDACTED]@rivm.nl]; [REDACTED] [REDACTED]@rivm.nl]; [REDACTED] [REDACTED]@rivm.nl]  
**From:** [REDACTED]  
**Sent:** Sun 11/8/2020 6:16:34 PM  
**Subject:** RE: Antw: virusmutaties Denemarken nertsen  
**Received:** Sun 11/8/2020 6:16:35 PM

Ik zie [REDACTED] uitgebreid morgenmiddag, ik zal hem bijpraten, in de ochtend is [REDACTED] in Den Haag.

Groet, [REDACTED]

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**From:** [REDACTED] <[REDACTED]@rivm.nl>  
**Sent:** zondag 8 november 2020 19:09  
**To:** [REDACTED] <[REDACTED]@rivm.nl>; [REDACTED] <[REDACTED]@rivm.nl>; [REDACTED] <[REDACTED]@rivm.nl>  
**Subject:** RE: Antw: virusmutaties Denemarken nertsen

Ha collega's,

Hieronder even het WHO advies/handig officiële info voor ons advies.

[REDACTED] voor laten zitten is goed idee als [REDACTED] hij het advies in briefvorm ondertekenen. Wel handig als hij op het RIVM kan zijn dan, [REDACTED] wil je dat met hem overleggen?

Groet [REDACTED]

#### HR Criteria

##### Serious Public Health Impact

The COVID-19 pandemic continues with an increasing number of cases and death. Since June 2020, human cases of SARS-CoV-2 associated with infected mink have been documented in Denmark. The SARS-CoV-2 mink outbreak originated from human cases. The Danish public health authorities have recently reported the detection of new mink-associated SARS-CoV-2 variants, one of the variants "cluster 5" carries four mutations, this variant strain has since been detected in 12 persons. Preliminary studies suggest that the variant virus has a decreased susceptibility to neutralizing antibodies from individuals recovered from COVID-19; however, the implications of the identified mutations of this variant are not yet well understood and require further investigation. The Danish authorities consider that continued mink breeding during the ongoing pandemic presents a significant risk for spill-over and spill-back. Human infections with this "cluster 5" SARS-CoV-2 variant have been identified and early observations among the small number of cases recognized to date suggest the clinical presentation, severity, and transmission among those infected are similar to other circulating SARS-CoV-2 viruses. Further spread of this mink-associated variant virus could potentially cause serious public health impacts, should studies find that vaccines currently under development would be less effective against this particular virus variant, or that this variant strain may be able to re-infect previously infected persons by wildtype SARS-CoV-2 virus, or that it may affect diagnostic tests.

Minks have previously been observed to be infected with SARS-CoV-2, the virus which causes COVID-19, with the first two SARS-CoV-2 outbreaks in large mink farms reported in The Netherlands on 23 and 25 April 2020.

##### Unusual or unexpected

This particular mink-associated variant virus (referred to as 'cluster 5 variant virus') has not been identified in humans and minks prior to September 2020.

##### International disease spread

The cluster 5 variant virus has been found in humans who are living in North-western Denmark (North Jutland) around mink affected farms. Despite the current ongoing strict public health measures, including mass culling of all minks in Denmark to eliminate the on-going reservoir, mass screening of the local population to detect further cases, and local movement restrictions to reduce further transmission, it is most likely that not all historical cases have been detected as only 12.7% of samples from week 33 to date from Northern Jutland have been sequenced. Further spread of this cluster 5 variant within and outside Denmark cannot be excluded, although swift and comprehensive public health responses by the Danish authorities should reduce such risk.

##### Interference with international travel or trade

WHO does not recommend restrictions on international travel and/or trade based on the current available information. However, the Danish authorities have introduced strict travel restrictions in the affected areas in North Jutland, Denmark. Denmark will close the mink industry until further notice.

Date first Published to EIS: Tuesday, March 3, 2020 - 15:59

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**Date / Time Published:**2020-11-06 19:40

#### **Situation update**

Danish authorities reported an extensive spread of SARS-CoV-2 outbreaks in mink farms since June 2020, with localised culling of mink farms since that time. However, infections have spread quickly within and between farms in Denmark, and as of 4 November, a total of 214 mink are infected. Denmark has reported 214 cases in humans of SARS-CoV-2 associated with infected mink primarily living in rural areas and geographically located near infected mink farms since June. The Danish public health authorities now report the detection of an associated SARS-CoV-2 variant with a combination of mutations not previously observed (referred to as 'cluster 5') in 12 persons.

SARS-CoV-2 associated with mink farms currently represent approximately 50% of circulating human cases in North Jutland and are in rural areas of the region. Human-to-mink and mink-to-human transmission has been documented, including subsequent human-to-human transmission.

To date, the Danish Public Health Authority (Statens Serum Institut, SSI) has identified seven unique mink mutations in the SARS-CoV-2 protein of the variants circulating in minks and humans. SSI cultured and tested a variant with four simultaneous changes in the spike protein (amino acid changes: H69del/V70del, Y453F, I692V, M1229I), which were identified in minks and isolated from 12 human patients. Virus neutralization assay results suggested a lower capability of antibodies to neutralize this virus. In order to confirm this preliminary finding, additional experiments are required.

As of 5 November 2020, Denmark has identified 12 human infections with this strain since September 2020. The age of cases range from 1 to 79 years old, all 12 cases were detected in North Jutland, eight had a link to the mink farming industry and four cases are from the general community.

#### **Public Health Response**

On 4 November 2020, Denmark decided to cull all farmed mink in Denmark, given the evidence that this animal population is acting as an ongoing virus reservoir and contributing to the ongoing COVID-19 infections in Denmark.

New restrictions have been introduced in the affected areas in North Jutland, Denmark on 5 November. These include following gathering of a maximum of 10 people and strict movement restrictions between the affected municipalities, and in/out of North Jutland.

Danish authorities will further increase their current testing capacity of 70 000 tests per day, and the sequencing capacity in the affected areas and across the country for enhanced surveillance of this virus variant. The population residing in the affected area have been strongly encouraged to seek testing for COVID-19, which Danish authorities will conduct using molecular tests. Danish authorities shared the sequences of the Danish SARS-CoV-2 from mink and humans to GISAID on 6 November.

Danish authorities are working closely with WHO and WHO's SARS-CoV-2 Virus Evolution Working Group (which is part of the WHO Reference Laboratory Network) to plan laboratory experiments to better characterize the cluster 5 variant SARS-CoV-2 properties and potential implications, including on countermeasures for COVID-19.

WHO acknowledges the strong public health measures taken by Danish authorities to contain any spread of all the SARS-CoV-2 strains with mink. The Danish Government has taken a serious decision to cull the entire mink population of about 17 million animals in North Jutland including its breeding stock; apply strict population movement restrictions within and out of the affected municipalities in North Jutland; conduct increased population-wide PCR testing in North Jutland; and increased SARS-CoV-2 virus sequencing across the country.

WHO also advises Denmark that any further cases identified with the new strain are subject to forward and backward contact tracing to further contain any additionally identified cases and prevent onward spread.

#### **WHO Risk Assessment**

All viruses, including SARS-CoV-2, mutate but most of the mutations do not have a direct benefit to the virus or may even be detrimental. SARS-CoV-2 strains infecting minks, which are subsequently transmitted back to humans may have acquired unique mutations, to adapt to a new host. In order to fully understand the impact of specific mutations on viral properties and effectiveness of diagnostics, therapeutics

vaccines, further advanced laboratory studies are required. These are time-consuming and are done in close collaboration between research groups.

The recent findings in Denmark of novel variants of SARS-CoV-2 identified in humans need to be confirmed and further evaluated to understand their potential implications in terms of transmission, clinical presentation, and vaccine development.

Actions by the Danish authorities, aimed at limiting the spread of the newly discovered virus variant, include mass culling of all farm Denmark, restricting movement in affected areas, widespread testing of people living in the affected areas, and increased sequencing of SARS-CoV-2 viruses across the entire country is currently being implemented.

The sharing of full genome sequences will facilitate detailed analyses by partners. The WHO SARS-CoV-2 virus evolution working group is working with the SSI scientists to better understand the available results and support further studies. Further scientific and laboratory studies are required to understand the implications of these viruses in terms of available SARS-CoV-2 diagnostics (e.g. if these mutations affect the binding of primer/probes of existing assays), therapeutics, and vaccines in development.

#### **WHO Advice**

This event highlights the important role that farmed mink populations can play in the on-going transmission of SARS-CoV-2 and the importance of strong surveillance, sampling and sequencing of these viruses, especially around areas where such animal reservoirs have been identified.

The global relevance of the preliminary findings by Denmark is potentially significant and WHO recognises the importance of prompt epidemiological, virological, and full genome sequence information with other countries and research teams, including through open platforms such as GISAID.

WHO advises further virological studies should be conducted to understand the specific mutations described by Denmark and to further investigate any epidemiological changes in the function of the virus in terms of infectivity and pathogenicity. WHO advises all countries to increase the sequencing of SARS-CoV-2 viruses where possible and sharing of sequence data internationally, in particular, to report mutations of concern where found.

WHO advises all countries to increase surveillance for COVID-19 infections at the animal-human interface where susceptible animal reservoirs are identified (including mink farms).

WHO also reminds countries to strengthen farming biosafety and biosecurity measures around known animal reservoirs (in particular mink farms) in order to limit the risk of zoonotic events associated with COVID-19. This includes infection prevention and control measures for farm workers, farm visitors, and those who are involved in animal husbandry or culling.

It is important to remind communities and health workers of the basic principles to reduce the general risk of transmission of acute respiratory infections:

- Avoiding close contact with people suffering from acute respiratory infections.
  - Frequent hand-washing, especially after direct contact with ill people or their environment.
  - Avoiding unprotected contact with farm or wild animals.
  - People with symptoms of acute respiratory infection should practice cough etiquette (maintain distance, cover coughs and sneezes with disposable tissues or clothing, and wash hands).
  - Within healthcare facilities, enhance standard infection prevention and control practices in hospitals, especially in emergency departments.
- WHO recommends the health measures as listed above for all travellers, including to and from Denmark. In case of symptoms suggesting acute respiratory illness either during or after travel, the travellers are encouraged to seek medical attention and share their travel history with their health care provider. Health authorities should work with travel, transport, and tourism sectors to provide travellers with information to reduce the general risk of acute respiratory infections via travel health clinics, travel agencies, conveyance operators, and at points of entry.

WHO has provided interim guidance for novel coronaviruses (see references below).

WHO advises against the application of any travel or trade restrictions for Denmark based on the information currently available or

#### **For more information on COVID-19, please see:**

1. WHO Novel coronavirus (COVID-19). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
2. WHO Technical interim guidance for novel coronavirus. Available at: <https://www.who.int/health-topics/coronavirus>

- j. WHO travel advice for international travel and trade in relation to the outbreak of pneumonia caused by a new coronavirus in China at: [https://www.who.int/ith/2020-0901\\_outbreak\\_of\\_Pneumonia\\_caused\\_by\\_a\\_new\\_coronavirus\\_in\\_C/en/](https://www.who.int/ith/2020-0901_outbreak_of_Pneumonia_caused_by_a_new_coronavirus_in_C/en/)
- l. WHO Novel Coronavirus (COVID-19) situation reports. Available at : <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
- j. WHO Dashboard for Novel coronavirus (COVID-19). Available at: <http://who.maps.arcgis.com/apps/opsdashboard/index.html#/c88e37cfc43b4ed3baf977d77e4a0667>

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**From:** 5.1.2e <5.1.2e@rivm.nl>  
**Sent:** zondag 8 november 2020 15:02  
**To:** 5.1.2e <5.1.2e@rivm.nl>; 5.1.2e <5.1.2e@rivm.nl>; 5.1.2e <5.1.2e@rivm.nl>  
**Subject:** RE: Antw: virusmutaties Denemarken nertsen

Handig om dit door 5.1.2e te laten leiden?

Groet, 5.1.2e

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**From:** 5.1.2e <5.1.2e@rivm.nl>  
**Sent:** zondag 8 november 2020 14:59  
**To:** 5.1.2e <5.1.2e@rivm.nl>; 5.1.2e <5.1.2e@rivm.nl>; 5.1.2e <5.1.2e@rivm.nl>  
**Subject:** Antw: virusmutaties Denemarken nertsen

Beste allen,

Deze vragen komen steeds weer terug, ondanks onze antwoorden.  
 Idee was om morgen in petit-comité te overleggen, lijkt me goed om dit breder te trekken nu er concrete vragen van vws zijn, zodat het antwoord vanuit een brede groep komt. Dus een Ao-z met alle leden.

5.1.2e

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**Van:** 5.1.2e <5.1.2e@rivm.nl>  
**Verzonden op:** zondag 8 november 2020 14:34  
**Aan:** 5.1.2e <5.1.2e@rivm.nl>; 5.1.2e <5.1.2e@rivm.nl>; 5.1.2e <5.1.2e@rivm.nl>  
**Onderwerp:** FW: virusmutaties Denemarken nertsen

Het AO-Z morgen is heel belangrijk, daarin kunnen de vragen van VWS beantwoord worden in een brief die door 5.1.2e wordt ondertekend en naar VWS/LNV gaat. Groetjes, 5.1.2e

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**From:** 5.1.2e <5.1.2e@uu.nl>  
**Sent:** zondag 8 november 2020 08:29  
**To:** 5.1.2e <5.1.2e@gmail.com>  
**Cc:** 5.1.2e <5.1.2e@erasmusmc.nl>; 5.1.2e <5.1.2e@rivm.nl>  
**Subject:** Re: virusmutaties Denemarken nertsen

Deq 5.1.2e

5.1.2e

5.1.2l

[Redacted]

5.1.2i

Groeten,  
5.1.2e

**Van:** 5.1.2e <5.1.2e@gmail.com>

**Datum:** zaterdag 7 november 2020 om 20:02

**Aan:** 5.1.2e <5.1.2e@uu.nl>

**CC:** 5.1.2e <5.1.2e@erasmusmc.nl>, 5.1.2e <5.1.2e@rivm.nl>

**Onderwerp:** virusmutaties Denemarken nertsen

Ha 5.1.2e

[Redacted]

5.1.2i

Met dank en vrGr,  
5.1.2e

+++++

Zoiets zou het dan worden, en ik vraag nog even of we inreizen uit D'marken mee willen nemen

**Van:** 5.1.2e <5.1.2e@minvws.nl>

**Verzonden:** zaterdag 7 november 2020 14:52

**Aan:** 5.1.2e <5.1.2e@minvws.nl>; 5.1.2e <5.1.2e@minvws.nl>; 5.1.2e <5.1.2e@minvws.nl>

**Onderwerp:** Spreeklijn-QA virusmutaties 6 november-aangepast

Tav vragen voor OMT-Z advies met 5.1.2e volgende vragen bedacht:

[Redacted]

5.1.2i

Zij gaat na bij 5.1.2e en 5.1.2e en laat me vandaag iets weten.

Tot later!

Gr  
5.1.2e

Dit bericht kan informatie bevatten die niet voor u is bestemd. Indien u niet de geadresseerde bent of dit bericht abusievelijk aan u is verzonden, wordt u verzocht dat aan de afzender te melden en het bericht te verwijderen. Het RIVM aanvaardt geen aansprakelijkheid voor schade, van welke aard ook, die voortvloeit uit het gebruik van elektronische berichten.  
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