

Dealing with infectious diseases on board RV Polarstern and at Neumayer Station III

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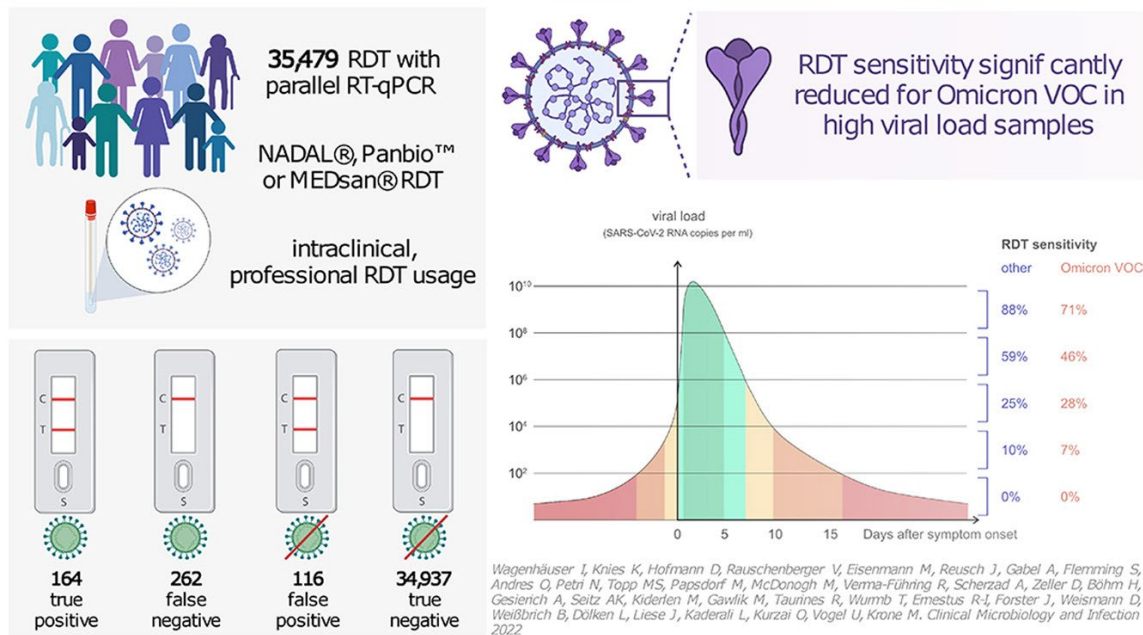
The outbreak of infectious diseases such as acute respiratory diseases (ARE, e.g. caused by influenza A/B viruses, RS viruses, SARS Co-2 viruses, etc.) and diarrheal diseases (e.g. caused by noroviruses, rotaviruses, etc.) is always a serious problem, especially in view of the cramped conditions on a ship and at Neumayer Station III, which jeopardizes the success of the expedition and, above all, the health of the participants. In the event of an infection, the ship's doctor or the station's doctor will therefore determine the appropriate measures, if necessary together with the captain or the expedition leader.

1. Preparation and Prevention

- **Vaccinations and medical check-ups:** All crew members, technical personnel and expedition participants will be checked for vaccinations and health by authorized doctors or the company medical center before departure. The STIKO recommendations apply.

- **Recommendation to use the available rapid tests on your own responsibility before traveling (SARS CoV-2):** The readily available rapid tests for SARS CoV-2 should continue to be used independently. This should be done before departure and/or boarding /onward travel to Antarctica from the Gateway. In this way, asymptomatic diseases should be detected and a safe initial situation documented as best as possible. Although the probability of a positive result is low, it does exist, especially in a group that is more exposed due to long journeys. Asymptomatic people who test positive can in principle take part in a trip, but must ensure that third parties are not infected (AHA rules, wearing a mask). Symptomatic persons who test positive must report immediately to the ship's doctor or the station's doctor.

Virus variant specific clinical performance of SARS-CoV-2 rapid antigen tests in point-of-care use, November 2020 to January 2022



- **Any change in the state of health of expedition participants** between the examination for expedition participation and departure **must always be brought to the attention of the WAZ** (see also medical questionnaire for expedition travelers).

- As a general rule, persons who are acutely ill should not depart without **consulting the WAZ**; persons who have tested positive during their journey should not continue their journey without **consulting the cruise director and/or, if applicable, the ship's doctor or the expedition director and/or the station's doctor**.

- **ARE-symptomatic persons will in any case be tested for detectable viruses** (influenza A/B, RSV, SARS CoV-2) by antigen test and, if necessary, by PCR test on board/at the station at the latest and the procedure described under point 3 will be followed.

- **Hygiene protocols:** Strict hygiene rules, such as regular hand washing and disinfection of surfaces, must be observed.

- **Training and education:** The crew/participants should be informed and trained about infection risks and preventive measures.

2. Early Detection and Monitoring

- **Health surveillance:** Symptoms in participants and crew members must be reported to the ship's doctor or the station's doctor

- **Testing:** Antigen test and, if necessary, PCR test for influenza A/B, RSV, SARS CoV2

3. Response to an outbreak

- **Medical treatment:** Provision of appropriate medical care for infected persons, including necessary medication and support.

3.1 If RS viruses are detected (RKI recommendations)

Route of infection Transmission is primarily by droplet infection from an infectious person to a contact person. It is assumed that transmission is also possible indirectly via contaminated hands, objects and surfaces on the mucous membranes of the respiratory tract.

Incubation period The incubation period is 2-8 days (average 5 days).

Duration of infectiousness RSV-infected persons can be infectious just one day after infection and even before the onset of symptoms. The duration of infectiousness is usually 3-8 days and usually subsides within a week in immunocompetent people.

Measures for individual cases Persons infected with RSV should be informed about protective and hygiene measures. They should not visit communal facilities while they are infectious.

If RSV is detected in a hospitalized person, they should be physically separated from others for the entire duration of their infectiousness. Cohort isolation of several RSV-infected persons is possible.

Dealing with contact persons Contact persons of persons infected with RSV must be informed about hygiene measures.

Concrete measures as part of the expedition: People who test positive must isolate themselves for 7 days (either in a single chamber or in a cabin), but can leave the chamber while observing the hygiene rules and wearing a mask. Contact persons will only be tested if symptoms are present. No general mask wearing, no serial testing in individual cases.

3.2 If influenza A/B viruses are detected (RKI recommendations)

Route of infection Influenza viruses are mainly transmitted by droplets with a particle size of more than 5µm, which are produced in particular when coughing or sneezing and can reach the mucous membranes of the respiratory tract of contact persons over a short distance. Individual publications also suggest the possibility of aerogenic transmission through so-called droplet nuclei, which are smaller (< 5µm), are also produced during normal breathing or speaking and can remain suspended in the air for longer. In addition, transmission is also possible through direct contact of the hands with surfaces contaminated with virus-containing secretions and subsequent hand-mouth-hand-nose contact (e.g. by shaking hands).

Incubation period The incubation period is short and averages 1-2 days.

Duration of infectiousness The duration of infectiousness is measured as the excretion of replicable viruses. On average, this is around 4 to 5 days from the onset of the first symptoms. One study indicated an average excretion period of 7 days in hospitalized patients who often have chronic pre-existing conditions and a more severe course (Leekha S, et al. 2007). From a pragmatic point of view, this suggests that patients hospitalized for influenza should be isolated for a period of 7 days.

Measures for individual cases Sick patients should be kept in a single room for 7 days from the onset of symptoms. It is mandatory to wear personal protective equipment, consisting of a protective gown, disposable gloves and a tight-fitting multi-layer mouth-nose protection as well as protective goggles, when entering the patient's room (see recommendations of the Commission for Hospital Hygiene and Infection Prevention (KRINKO) on infection prevention in the care and treatment of patients with communicable diseases).

Dealing with contact persons As far as practicable, contact with influenza sufferers should be reduced, especially for vulnerable groups of people.

Concrete measures as part of the expedition: People who test positive must isolate themselves for 7 days (either single chamber or cabin), but can leave the chamber while observing the hygiene rules and wearing a mask. Contact persons will only be tested if symptoms are present, but should follow the AHA rules particularly meticulously. No general mask wearing, no serial testing in individual cases.

3.3 If SARS Co-2 viruses are detected (RKI recommendations)

Route of infection The main route of transmission for SARS-CoV-2 is respiratory uptake, i.e. inhalation of virus-containing particles emitted by infectious persons. Transmission primarily occurs over short distances (approx. 1.5 m) in the form of droplets or aerosols. In closed rooms, transmission over a greater distance is also possible, as aerosols containing the virus can float in the air for up to hours and remain infectious.

Incubation period The average time from infection to the first symptoms (incubation period) for the sub-variants of the Omikron variant circulating since 2023 is approx. three days (range 1 - 12 days) and is therefore shorter than for the virus variants circulating at the beginning of the pandemic.

Duration of infectiousness Infected persons excrete viruses capable of replication even before the onset of symptoms. In the case of the Omikron variant, replicable viruses are excreted over a period of around five days after the onset of symptoms.

Measures for individual cases For people with respiratory tract infections (which can always be caused by SARS-CoV-2), the general rule is to stay at home for three to five days until symptoms improve significantly. If contact is unavoidable, a face mask should be worn to protect others.

Dealing with contact persons The epidemiological situation with COVID-19 does not require any infection control measures ordered by the health authorities for the general population in the sense of isolation of sick persons and quarantine of contact persons.

Specific measures as part of the expedition: People who test positive must isolate themselves until they are free of fever and symptoms for 48 hours (either in a single chamber or in a cabin), but can leave the chamber while observing the hygiene rules and wearing a mask. Contact persons are only tested if symptoms are present. No general wearing of masks, no testing in rows in individual cases.

3.4 Diarrheal diseases (RKI recommendations for cases of norovirus)

Route of infection The viruses are excreted via the stool and vomit of humans. The infectivity is very high, the minimum infectious dose should be approx. 10-100 virus particles. Transmission is fecal-oral (e.g. hand contact with contaminated surfaces) or through the oral ingestion of virus-containing droplets, which are produced in the course of gushy vomiting. This explains the very rapid spread of infection within retirement homes, hospitals and communal facilities.

Incubation period The incubation period is approx. 6-50 hours.

Duration of contagiousness People are highly contagious during the acute illness. From a pragmatic point of view, the symptomatic phase, including the first 48 hours after the cessation of symptoms (i.e. until the safe cessation of diarrhea or vomiting), is therefore of the greatest importance in terms of preventing further spread.

If the typical symptoms and epidemiological characteristics indicate a **norovirus infection**, preventive measures should be taken quickly and consistently due to the epidemic potential, even without waiting for confirmation by virological tests.

It is recommended that sick persons do not carry out any caring activities in healthcare and community facilities during the symptomatic phase.

The most important recommended measures are

- **Isolation of affected patients in a room with a private toilet;** cohort isolation if necessary;
- Instruction of patients and staff regarding **correct hand hygiene**, use of a hand disinfectant with “limited virucidal PLUS” or “virucidal” efficacy (see also point 2) and care of patients with disposable gloves, protective gowns and, if necessary, suitable respiratory protection to prevent infection in connection with vomiting;
- Carry out thorough hand hygiene, use a hand disinfectant with “limited virucidal PLUS” or “virucidal” activity (see also point 2) after removing disposable gloves and before leaving the isolation room;
- **daily (in sanitary areas more frequently if necessary) wipe disinfection of all contact surfaces** close to patients, including door handles, with a surface disinfectant with “limited virucidal PLUS” or “virucidal” activity (peroxides or aldehydes should be preferred as active substances);
- Clean contaminated surfaces (e.g. with stool or vomit) immediately after putting on a respiratory protection device;

- Use and disinfect personal care utensils;
- Transport bed and personal linen as infectious laundry in a closed laundry bag and clean and disinfect using a chemo-thermal washing process with virucidal effectiveness;
- Dishes can generally be machine-washed as usual;
- Contact persons (e.g. visitors, family) must be made aware of the possibility of human-to-human transmission through contact or droplets containing the virus when vomiting and instructed in correct hand disinfection;

Concrete measures during the expedition: Persons with suspected viral diarrhea must isolate themselves for at least 48 hours and until symptom-free (either single chamber or cabin). A separate toilet must be allocated.

In the event of an infection with high dynamics and a rapidly increasing number of sick persons, it is still the responsibility of the ship's doctor and the captain or the station's doctor and the expedition management to order further measures such as mandatory masks inside, staggered meal times, series tests, etc.

4. Further Information

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