Wuhan novel coronavirus (WN-CoV)

Guidance for sampling and laboratory investigations

Publication date
23 January 2020

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Based on PHE published guidance (as of 22 January 2020)
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Investigation and initial clinical management of possible cases

The case definition being used across the UK reflects our current understanding from the limited epidemiology available and will likely be subject to change as new information emerges.

Possible case definition

If the patient satisfies epidemiological and clinical criteria, they are classified as a possible case.

- **Epidemiological criteria**
  
  In the 14 days before the onset of illness:
  
  o travel to risk areas – see list here.
  
  OR
  
  o contact with confirmed cases of WN-CoV (see definition below)

- **Clinical criteria**
  
  o severe acute respiratory infection requiring admission to hospital with clinical or radiological evidence of pneumonia or acute respiratory distress syndrome
  
  OR
  
  o acute respiratory infection of any degree of severity (including at least one of: shortness of breath, cough or sore throat)

Clinicians should be alert to the possibility of atypical presentations in patients who are immunocompromised. Any individual reporting any contact with a confirmed case of WN-CoV, even if asymptomatic, should be reported to the local Health Protection Team immediately (see Appendix 1).

Contact definition

For the purposes of testing, contact with a case is defined as:

- living in the same household
  
  OR
  
- direct contact with the case or their body fluids or their laboratory specimens
  
  OR
  
- in the same room of a healthcare setting when an aerosol generating procedure is undertaken on the case
  
  OR
  
- within 2 metres of the case in any setting, for any length of time

An assessment for avian influenza risk factors should also be carried out for every individual that has travelled to China in the 10 days prior to onset of fever and lower respiratory tract symptoms. See avian influenza guidance.
Scope

This document describes in detail the samples required for establishing a diagnosis and monitoring confirmed WN-CoV infection, and the tests that will be performed.

It explains and supplements the information presented visually in the PHE guidance on "Laboratory investigations and sample requirements pathway".

Criteria for testing are outlined above in the section “Investigation and initial clinical management of possible cases of WN-CoV infection”.

Further guidance is available on:

- infection prevention and control – HPS guidance
- safe sampling and handling of laboratory samples – PHE guidance

If testing for avian influenza is also indicated - based on assessment of travel and exposure histories - specific and separate samples will need to be collected and sent to WoSSVC or Edinburgh SVC in line with current local testing arrangements. For more information, please see Avian Influenza Guidance.
Approach to sampling

- **Arrange urgent diagnostic sampling.** Local liaison with virology/microbiology departments is important to ensure that appropriate specimens are taken to establish the diagnosis.

- **It is essential to inform the laboratory before samples are sent,** and ensure that specimen request forms are clearly marked with the relevant clinical and epidemiological history.

- Point-of-care tests (POCTs) should not be performed without discussion with the local laboratory.

- A patient meeting the criteria for a possible case requires a minimum of 2 sets of samples to be collected at the same time and tested in parallel:
  - one set is for laboratory tests that are performed locally to identify common respiratory pathogens. This should be tested as per your local current arrangements in line with HPS infection prevention and control guidance and PHE Guidance on handling and processing of laboratory specimens. N.B If testing for avian influenza is also indicated - based on assessment of travel and exposure histories – additional specific and separate samples will need to be collected in line with current local testing arrangements. (see avian influenza guidance)
  - one set is to be sent to the national reference laboratory Respiratory Virus Unit, (RVU) at PHE Colindale for specialist coronavirus testing. The local lab will process and send samples to PHE Colindale (category B transport).

- Hospitals should have processes in place to ensure that each sample set is complete and that each set reaches the intended, separate destinations

**The local sample set**

- upper respiratory tract sample(s): combined viral nose and throat swab, or a viral nose swab and a viral throat swab, or a nasopharyngeal aspirate

- lower respiratory tract sample, if obtainable: sputum, endotracheal aspirate, or bronchoalveolar lavage fluid if bronchoscopy is clinically indicated. **Induction of sputum should be avoided.**

- other microbiological and virological investigations as clinically indicated (as part of the differential diagnosis, avian influenza should be excluded).
The PHE Colindale sample set

- upper respiratory tract sample(s): combined viral nose and throat swab, or a viral nose swab and a viral throat swab, or a nasopharyngeal aspirate; use of viral/universal transport medium is preferred.
- lower respiratory tract sample, if obtainable: sputum, endotracheal aspirate, or bronchoalveolar lavage fluid if bronchoscopy is clinically indicated.
- EDTA whole blood, 5 ml.
- urine in a sterile universal container (ideally half filled).
- faeces in a universal container, 10 g.
- sample for serology: 5 ml whole blood in a plain tube (no additives) if the sample can be delivered same day to Colindale, or serum separated locally from 5 ml whole blood, sending as much serum supernatant as possible.

If urine or faeces cannot be collected, **obtain and send the other samples in the Colindale sample set without delay.**

Additional samples which may be required

- Samples for repeat testing
  - In certain circumstances, repeat sampling may be required; RVU will contact the referring laboratory when this is indicated.

- Samples for monitoring confirmed WN-CoV infection
  - Sequential sampling may be required to monitor the progress of confirmed WN-CoV infection, decided on a case-by-case basis. RVU will advise the referring laboratory about the frequency of sampling and which sample types need to be collected on particular days.

- Samples for serological investigations
  - Based on knowledge of other coronavirus infections, it is likely that WN-CoV RNA is only detectable within a window period. This may be short in some individuals and could be missed, depending on when diagnostic sampling is performed in relation to the duration of symptoms.
  - Therefore, all patients that have samples submitted to RVU for WN-CoV molecular testing should also have acute and convalescent blood samples collected and sent to RVU for serological testing.
The acute sample should be collected and sent to RVU at the same time as other samples collected for primary diagnostic testing for WN-CoV. The convalescent sample should be collected 14 days after the acute sample and submitted to RVU for testing.

Arrangements will need to be made locally for phlebotomy and processing and forwarding of the serum samples to RVU.

Results of testing

- Results of testing should be provided to the referring clinician, referring lab and the local Health Protection Team.
- PHE Colindale Virus Reference Department, on provision of the results, will discuss with the referring lab/clinician whether repeat sampling is required or whether the patient can be removed from isolation.
- The local Health Protection Team should communicate the testing results to HPS.
**Guidance for microbiologists/virologists**

Local laboratories may receive requests to test samples from patients who have travelled to travel to risk areas – see list here.

Any case meeting the WN-CoV possible case definition, or the criteria for avian influenza testing, should be reported to the local Health Protection Team (see Appendix 1).

WN-CoV is notifiable as a health risk state under the Public Health (Scotland) Act 2008.

An overview of lab testing process can be seen in the PHE Laboratory investigations algorithm.

**Samples for local testing**

Local testing for common respiratory pathogens should be undertaken in a Biological Safety Level 3 (BSL3) laboratory\(^1\), and should include influenza testing and clinically appropriate testing for community acquired pneumonia pathogens.

Further information about safe sample handling is available in the PHE Guidance on handling and processing of laboratory specimens specific for WN-CoV.

The local sample set is for detecting common pathogens, particularly those that cause acute respiratory illnesses. The panel of pathogens and methods of detection will depend on local arrangements, but testing is recommended for upper and lower respiratory tract samples for influenza A and B viruses, Legionella sp., RSV, Parainfluenza virus 1-3, Adenovirus, and human metapneumovirus. Additional samples (for example sputum or swabs) should be collected and tested according to local policies for identifying bacterial infections, and fungal infections if indicated. Testing should be performed in line with local arrangements. Contact WoSSVC or Edinburgh SVC if required.

**Samples for referral**

\(^1\) All Scottish Laboratories have containment level 3 facilities available
The **Colindale sample set** is for the detection of novel coronaviruses. Samples should be packaged and sent to RVU by Category B transport. UN 3373 packaging must be used for sample transport.

Referring laboratories must notify the RVU before submitting samples. Contact the PHE Colindale duty doctor to inform them of a case for testing (0208 200 4400). **Do not wait for local results before sending these samples.**

Please use and adapt the [PHE influenza referral form E3](#), writing WN-CoV and other relevant details in the clinical free-text section.

Note that RVU will only perform coronavirus diagnostic testing; it is the responsibility of the treating centre to arrange investigations for other pathogens (including avian influenza if indicated).

**If testing for avian influenza is also indicated** - based on assessment of travel and exposure histories - specific and separate samples will need to be collected and sent to WoSSVC or Edinburgh SVC for testing in line with current local arrangements. This involves a screen with the influenza A matrix assay, followed by Influenza A subtyping of positives. Please contact WOSSVC or Edinburgh SVC if required.

**Contact information**

**For additional support for local sample set (including avian influenza):**

- WoSSVC (Tel: 0141 201 8722, for out of hours testing arrangements contact on-call virologist via switchboard 0141 211 4000)
- Edinburgh SVC (Tel: 0131 536 3373, for out of hours: 0131 536 1000)

**PHE Colindale duty doctor to inform of a case for testing**

Telephone 0208 200 4400

**For PHE Colindale sample set**

Respiratory virus unit (RVU)

Public Health England

61 Colindale Avenue

London

NW9 5EQ
# Appendices

## Appendix 1 – Contacts in local Health Protection teams

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<thead>
<tr>
<th></th>
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<tr>
<td><strong>HPS</strong></td>
<td>0141 300 1100</td>
<td>0141 211 3600</td>
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<td><strong>Ayrshire and Arran</strong></td>
<td>01292 885858</td>
<td>01563 521 133</td>
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<td><strong>Borders</strong></td>
<td>01896 825 560</td>
<td>01896 826 000</td>
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<td>01387 272 724</td>
<td>01387 246 246</td>
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<td>01592 226435 / 447</td>
<td>01383 623623</td>
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<td><strong>Forth Valley</strong></td>
<td>01786 457 283</td>
<td>01324 566 000</td>
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<td>01224 558 520</td>
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<td><strong>Greater Glasgow &amp; Clyde</strong></td>
<td>0141 201 4917</td>
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## Appendix 2 – Version history

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