MINISTRY OF HEALTH
SINGAPORE

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MOH CIRCULAR 17/2020

INTERIM BIOSAFETY GUIDELINES FOR LABORATORIES AND PERSONNEL HANDLING SAMPLES OR MATERIALS ASSOCIATED WITH THE 2019 NOVEL CORONAVIRUS (2019-nCoV)

A novel coronavirus, the 2019-nCoV was initially identified from cluster of pneumonia cases in Wuhan, China in December 2019. Following which, cases involving the virus were also reported in Hong Kong, Japan, Macau, Singapore, South Korea, Taiwan, Thailand and the United States of America.

2 In view of this, laboratories in Singapore may need to handle patients' samples or materials that could potentially contain the 2019-nCoV in their daily operations. As such, adequate precautions must be in place to ensure that such samples or materials are handled in a safe manner and that personnel coming into contact with the samples or materials are protected.

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3 As information about the 2019-nCoV is rapidly evolving, the Ministry of Health has prepared an interim Biosafety Guidelines (Annex A) for laboratories/personnel who are transporting, processing, performing diagnostic testing and/or performing any other related activities involving samples or materials which contain or are suspected to contain the 2019-nCoV. MOH will continue to monitor the developments and revise the guidelines if deemed necessary.

4 Please ensure that the contents of this circular are brought to the attention of all relevant personnel in your institution.

5 For clarification, please contact the officers from the MOH Biosafety (Tel: 63259205 or 63258459; or email: moh_biosafety@moh.gov.sg).

Associate Professor Benjamin Ong
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Ministry of Health

Annex A

I. Packaging and Transportation of Samples/Materials

Transport within Singapore

1. Clinical samples. Triple-packaging of all samples/materials. The primary and/or secondary container must be break-proof and leak-proof, and the external packaging must be labelled with biohazard logo.

   For local transportation of all samples/materials, public conveyances shall not be used. For intra-hospital transfer of samples/materials that are positive or highly suspected to be positive for the virus, pneumatic transfer systems shall not be used.

   During the transportation process, the samples/materials shall be placed in an upright position. All samples/materials are to be delivered by hand, whenever possible.

2. Virus isolates or cultures confirmed to contain the virus shall be packaged and transported according to the Biological Agents and Toxins (Transportation) Regulations [https://www.moh.gov.sg/biosafety].

3. Necessary precautions shall be taken if other hazardous materials (such as dry ice or liquid nitrogen) are to be used.

4. Shipper[1] must be trained and are liable to ensure all items are properly and safely packaged.

5. The shipper/transferor shall notify the recipient laboratory as soon as possible, once the sample/material is being transported.

International Air Shipment

For international air shipment, the requirements of the International Air Transport Associations (IATA) shall be followed –

(a) Clinical samples: Ship as Category B, UN3373 biological substance.
(b) Viral cultures: Ship as Category A, UN2814 infectious substances affecting human.

II. Processing and Laboratory Testing of Samples

The following precautions are to be taken when handling and processing samples which contain or are suspected to contain 2019-nCoV:

Procedures	Requirements
Serology assay (e.g. antigen or antibody detection) or	**Only to be carried out in Biosafety Level-2 (BSL-2+) Plus Laboratory** • Standard personal protective clothing including laboratory

[1] The person who prepared the packaging of the samples to be transferred or exported.

Procedures	Requirements
Molecular assay (e.g. PCR or sequencing) or Pathological examination and processing of formalin-fixed or otherwise inactivated tissues.	coat/gown and gloves; and mucosal and respiratory protection (e.g. eye protection and N95 respirator or equivalent), as indicated by risk assessment • Procedures or manipulations involving potentially infectious materials (e.g., handling of clinical samples) are to be carried out in a certified Class II Biological Safety Cabinet (BSC) • Special care shall be taken to prevent aerosolisation of samples • Centrifugation of samples are to be carried out using sealed centrifuge cups or rotors that are unloaded in a Class II BSC • Secondary leak-proof containers must be used to transport or store potentially infectious samples within the laboratory • Personnel handling such samples must be trained or have demonstrated proficiency in microbiological practices and techniques • Emergency response procedures shall be in place and staff are to be trained in the procedures
Virus culture and manipulation of live virus (e.g., virus isolation, virus neutralisation assay, packaging of positive cultures)	**Can only be carried out in a certified Biosafety Level-3 (BSL-3) Laboratory with BSL-3 practices**
Laboratory procedures other than the ones listed above	Perform risk assessment and consult MOH Biosafety before commencement of such work

Note: MOH Biosafety shall be consulted before commencement of any of the above procedures for **non-diagnostic purposes**.

III. Sample/Material Inventory

A **robust inventory management system** must be implemented to ensure all samples/materials are properly labelled, accounted for and their movement could be efficiently tracked.

All samples/materials are to be secured within the laboratory with restricted access control implemented. **Sharing or distribution of samples** (e.g. inter-laboratory transfer) is discouraged unless necessary for patient management purposes. In such a case, the recipient laboratory must have all the necessary safety and security measures in place prior to the receipt of samples.

IV. Disinfectants

The following disinfectants that are effective on Severe Acute Respiratory Syndrome (SARS) coronavirus[2] and shall be considered for use:

- Sodium hypochlorite
- Ice-cold acetone
- Ice-cold acetone/methanol mixture (40:60)
- Ethanol (70%)
- Paraformaldehyde
- Glutaraldehyde

V. Waste Management

All waste management procedures shall be conducted in accordance with requirements of the relevant local authorities.

VI. Occupational Health

All laboratory personnel should practice self-monitoring for fever or any other related symptoms. Personnel presenting symptoms of respiratory infections and/or has reason to believe that they were exposed to the virus shall immediately report the matter to their supervisor or the medical authorities so that they can receive appropriate medical advice or management.

Any adverse incident or accident involving potential or actual exposure to the virus should be reported to the supervisor for evaluation and advice. MOH Biosafety must also be notified as soon as possible, within 24 hours.

[2] Public Health Agency of Canada Pathogen Safety Data Sheet for Severe Acute Respiratory Syndrome (SARS) Associated Coronavirus (https://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/sars-sras-eng.php)