



health

Department:
Health
REPUBLIC OF SOUTH AFRICA



Guidelines on Post Mortem Testing for Natural Deaths

October 2020


FOREWORD

The World Health Organization (WHO) declared COVID-19 a global pandemic on 11 March 2020. The first case was diagnosed in South Africa on 5 March 2020, and the country is now facing a particular challenge given the large vulnerable immune compromised population living in overcrowded conditions.

The Minister of Health, Dr Zwelini Mkhize, announced that post-mortem swabs must be collected from all patients that died from natural causes, where a COVID-19 test had not been performed. This is to ensure that the South Africa has better statistics to understand the extent of the pandemic. Confirmation of diagnosis is also necessary to institute appropriate public health action similar to management of confirmed COVID-19 cases.

These guidelines provide guidance on the Post Mortem Testing for Natural Deaths. It provides specific guidance for the collection and submission of COVID-19 postmortem specimens from all people who died of natural causes outside health facilities. It covers those who were not tested for COVID-19 prior to death.

As knowledge regarding strategies to address COVID-19 develops globally and in South Africa, these guidelines will continue to be updated regularly based on emerging evidence and WHO recommendations.



DR. SSS BUTHELEZI
DIRECTOR-GENERAL: HEALTH
DATE: 2020/10/13

1 Introduction

- 1.1. Excess mortality is a term used in epidemiology and public health that refers to the number of deaths that are occurring beyond what would have normally been expected. The South African Medical Research Council (SAMRC) reports that in the past weeks, the mortality have shown a striking increase. The SAMRC stated that the weekly death reports have revealed a huge discrepancy between confirmed COVID-19 deaths and number of excess natural deaths in the country.
- 1.2. According to the SAMRC, excess deaths would comprise COVID-19 deaths that are confirmed, COVID-19 deaths that have not been confirmed, as well as other deaths that may arise from conditions that might normally have been diagnosed and treated had the public been willing and able to access healthcare services.
- 1.3. In terms of the Births and Deaths Registration Amendment Act (Act No. 18 of 2010), all deaths need to be certified by a medical practitioner. The Emergency Medical personnel may declare a death; and a notice of death to the Department of Home Affairs (DHA) must be given by the informant within 72 hours of the death. Where a death occurs in a rural area where there is no access to a medical practitioner, the informant notifies the local chief, who completes the death notification (DHA-1680) form submitted to the DHA.
- 1.4 This document provides specific guidance for the collection and submission of COVID-19 postmortem specimens from all people who died of natural causes outside health facilities. It covers those who were not tested for COVID-19 prior to death. Recommendations for biosafety and infection control practices during specimen collection and handling are also included. This document draws on interim guidelines from the Centres for Disease Control¹ and Prevention as well as local guidelines for specimen packaging and transport².

2. Who should be tested?

- 2.1. The Minister of Health, Dr Zwelini Mkhize announced during a media briefing held on the 5th August 2020 that “as part of improving the records of COVID-19 related deaths in response to reports on excess deaths, we now require that all the sudden deaths and those that occur at home must have specimens taken for COVID-19 before a death certificate is issued”. Subsequently, a Circular has been issued to this effect by the Director-General on 12 August 2020. The Circular mandates COVID-19 testing of all persons who die at home or outside health facilities. In this regard, postmortem testing for SARS-CoV-2 should be conducted on all persons who pass on at home or outside a health facility.

3. Who is Responsible for Collecting the Specimen?

- 3.1 For patients dying in a hospital, the Medical Practitioner who issues the death certificate for a natural death must take a specimen for a COVID-19 test if the patient was not already tested/diagnosed. For patients dying outside of hospital, the Medical Practitioner who certifies and issues the death certificate for a natural death must take a specimen for a COVID-19. If a Medical Practitioner is not available, a mortician or any suitable professional identified, including a nurse may take COVID-19 specimen.
- 3.2 The Medical Practitioner must explain to the family why it is necessary for the test to be conducted; and explain that a diagnosis is required to establish if the deceased was positive for SARS-Cov-2. The diagnosis is important also for the family members who may have been

exposed. Close contacts of the deceased who have COVID-19 symptoms should be requested to quarantine while awaiting results.

3.3 The Medical Practitioner must obtain written family consent before proceeding to collect the specimen. The informed consent should be collected on the attached form (Appendix 1). The next of kin's contact details must be established to report results.

3.4 COVID -19 specimen may be collected at a mortuary or at home where necessary. Specimen collection should be performed at time of collection of fingerprints from the deceased.

3.5 While burial should not be delayed while awaiting postmortem results, the clinician should advise that the remains must be managed as if it were COVID-19 positive, and all Environmental Health Guidelines for Management of Human Remains in the Context of COVID-19 must be followed.

4. Collection of Postmortem Specimens

4.1 Specimen collection material. The following material is required:

- a) The NHLS specimen request form (N1 PHC form),
- b) a cotton-tipped swab and holder, and
- c) a specimen bag

4.2 These may be collected from the closest NHLS laboratory, or from the district environmental health practitioner or from the closest primary health care clinic.

4.3 A list of NHLS laboratories and their contact details may be found at <https://www.nhls.ac.za/about-us/laboratories/>

4.4 A list of primary health clinics may be found at:
<https://dd.dhmis.org/orgunits.html?file=NIDS%20Integrated&source=nids&ver=f098>

5. Forms to be completed

5.1 Complete the NHLS or private laboratory request form (the N1 PHC form) using instructions provided. No costs will be incurred by the family of the deceased if the COVID-19 postmortem test is done by NHLS on behalf of government. Private laboratories are not recommended because they will need to charge the family of the deceased since the COVID19 post-mortem tests are not covered by existing medical insurances. Private laboratories will need to follow existing COVID-19 results reporting processes for postmortem tests.

5.2 The specimen and the completed form should be sent to the closest government clinic or NHLS laboratory. If specimens are to be dropped off at the closest government PHC facility/clinic, the mortician should make contact with the clinic to establish the time NHLS courier service takes specimens to the NHLS laboratory. Specimens can be dropped at the closest NHLS laboratory at any time. The specimens should be kept in the fridge if they cannot be transported immediately.

6. Mandatory information to be provided on the N1 PHC form

5.1 Detailed instructions regarding completion of specimen request forms will be provided. The following mandatory information should be included on the lab request form:

- I. District Name
- II. Service Point: **Post mortem specimen** (*this must be clearly written*)
- III. Information of the deceased:
 - a. Surname and name
 - b. Sex
 - c. Date of birth
 - d. Address (of next of kin)
 - e. Mobile telephone number (of next of kin)
 - f. Alternative telephone number (for next of kin)
 - g. ID number of the deceased (or passport number) if available
- IV. Health care worker name, registration number and contact details
- V. Specimen type: NP swab
- VI. Test required: CoV-2 PCR

7. Completion of 'Death Summary Report' in Appendix 3

- 7.1 The people who died at home and their COVID-19 testing will be reported to NDoH using a separate form from the Department of Home Affairs Death Notification Form.
- 7.2 COVID-19 Death Summary Form indicates demographic, test results and death related data. This form will need to be completed by the professional who obtains the specimen from the deceased, and submitted to relevant health facility/authority.

8. Information to support collection of the result

- 8.1 The bar code sticker with the reference number for the NHLS laboratory will be used. An example of the NHLS bar code sticker is shown below.



- 8.2 After completing the N1 PHC request form, the health professional/mortician should take barcode stickers on the form and place them in the following forms/places:
 - a) Stick one on the consent form in Appendix 1
 - b) Stick a second one on the Death Summary Report in the section 'Lab reference number'
 - c) Keep one in the Mortuary Register; and
 - d) Give one to the family member along with the NHLS Call Centre number 0800 029 999.
 - e) The family can call the NHLS call centre number and provide the bar code sticker number to obtain the results

9. Recommended Postmortem Specimens

- 9.1 Collection of the following postmortem specimens is recommended, if an autopsy is not performed: In this regard:
 - i. A single postmortem nasopharyngeal swab (NP swab) is preferred.

9.2 When the collection of a postmortem NP swab is not possible, each of the following is an acceptable alternative:

- a) An oropharyngeal (OP) specimen
- b) A nasal mid-turbinate (NMT) swab
- c) An anterior nares (nasal swab; NS) specimen
- d) Nasopharyngeal wash/aspirate or nasal aspirate (NA) specimen

9.3 Use only synthetic fiber swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts, as they may contain substances that inactivate some viruses and inhibit PCR testing.

9.4 Place swabs immediately into sterile tubes containing 2-3 ml of universal/viral transport medium (UTM) or sterile saline. If UTM is not available, use dry swabs in a sterile tube. Postmortem specimens will need to be clearly marked for ease of reporting and prioritization.

10. Collection of Postmortem Swab Specimens for COVID-19 Testing

10.1 Respiratory viruses are best isolated from material that contains infected cells and secretions. Therefore, swabs should aim to brush cells and secretions off the mucous membranes of the upper respiratory tract. Good specimen quality (i.e. containing sufficient cells and secretions) and appropriate packaging and transport (i.e. to keep virus viable/detectable) are essential.

10.2 Upper Respiratory Tract Specimen Collection

- i. Don appropriate PPE
- ii. Open a sterile flocked swab at the plastic shaft
- iii. For a nasopharyngeal specimen: Insert flexible wire shaft mini-tip swab through the nares parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from the ear to the nostril of the patient, indicating contact with the nasopharynx. Swab should reach depth equal to distance from nostrils to outer opening of the ear. Rotate swab 2-3 times and hold in place for 2-3 seconds to absorb secretions. Slowly remove swab while rotating it.
- iv. For a mid-turbinate specimen: Gently insert swab less than 2 cm into nostril (until resistance is met at turbinates) and gently rotate several times against nasal wall and repeat in other nostril using the same swab.
- v. For a nasal specimen: Insert the swab at least 1 cm inside the nares and firmly sample the nasal membrane by rotating the swab and leaving in place for 10 to 15 seconds. Sample both nares with same swab.
- vi. After collection of the specimen, slowly withdraw the swab and put it into the specimen container. If swab comes in a plastic peel pouch, remove, collect specimen and transfer swab in a separate container and close. For swabs with UTM or saline tube, break plastic shaft at the break point line into UTM/saline and tightly close the tube.
- vii. Place specimen tube into the Ziploc bag with the lab request form. Seal the bag, taking care to keep it uncontaminated.
- viii. Place specimen bag in the fridge or cool place until transport to the laboratory/place in cooler box with ice blocks.
- ix. Specimens must be transferred from the autopsy suite in a safe manner to the laboratory where it can be processed.

11. Timing of Collection of postmortem swab

- a. No data is currently available on the frequency of detection of SARS-Cov-2 by RT-PCR on postmortem swabs collected at different durations after death. If COVID-19 testing on postmortem swab specimens is being considered for a suspected COVID-19 case, SARS-CoV-2 RNA may still be detected up to 3 days postmortem and possibly longer based on available data from experiences with MERS-CoV and SARS-CoV; however sensitivity may be reduced with a longer postmortem interval, and duration of illness may need to be considered in interpreting a negative result.
- b. Postmortem specimen should be collected as soon as possible after death, provided recommended Infection Prevention and Control procedures can be followed. Specimen collection should not be delayed beyond 3-4 days

12. Submission of Specimens for Testing

- 12.1 Medical practitioners, the NHLS and the health departments should work together to coordinate testing through public health laboratories.
- 12.2 Transport to NHLS laboratory on the day of specimen collection
- 12.3 If transport to the testing laboratory is <2 days, dry swabs can be used, and transported at ambient temperature
- 12.4 If transport to the testing laboratory is ≥2 days, swabs should be transported in UTM/saline preferably at 2-8°C
- 12.5 The tube needs to be closed tightly, leaking specimens will be rejected
- 12.6 Postmortem specimens collected at public health facilities should be submitted to the NHLS laboratories using routine NHLS specimen collection and transport systems. Specimens collected by private hospital or general practitioners may be submitted to their routine private laboratory using established specimen collection and transport systems. Private laboratories will transfer the specimens to the NHLS laboratories for testing. It is important that specimens are clearly marked as postmortem specimens.

13. Case notification (for all confirmed cases)

- 13.1 COVID-19 is classified as a Category 1 notifiable medical condition (NMC). Therefore, notification of confirmed postmortem cases should be made immediately by the practitioner who collected the swab, using the NMC web portal, mobile app (preferred methods), or NMC paper-based reporting form. These reporting structures will prompt appropriate public health response as per any living COVID-19 case. The form and instructions for using the COVID-19 NMC module are available on the National Institute for Communicable Diseases website: <https://www.nicd.ac.za/diseases-a-z-index/covid-19/covid-19-resources/>.

14. Collection of Results of COVID-19 testing

- 14.1 It is important for the family, for the mortician and all who came into contact with the deceased to know the result of the COVID-19 testing. District contact tracing teams will need to be notified of positive COVID-19 results for this purpose.

14.2 District contact tracing teams are notified of all positive COVID-19 results. If the specimen request form has been correctly completed, the contact details for the next of kin of the deceased will be available on the line list of cases that is sent to the provinces. The contact tracing team will then follow up with the next of kin.

14.3 In addition, the family and funeral undertaker should retain the barcode sticker, and will be able to call the COVID toll-free number (0860 029 999) to obtain the result.

15. Recommended Biosafety and Infection Control Practices

15.1 These recommendations apply if **only** postmortem NP swabs are being collected from a deceased person for COVID-19 testing. Since the collection of nasopharyngeal swab specimens from deceased persons will not induce coughing or sneezing, N-95 respirator or higher is **not** required.

15.2 Individuals in the room during specimen collection should be limited to healthcare personnel obtaining the specimen.

15.3 Standard precautions should be followed.

15.4 The following PPE should be worn as a minimum:

- a) Gloves (nonsterile, nitrile, latex or rubber gloves) when handling potentially infectious materials.
- b) If there is a risk of cuts, puncture wounds, or other injuries that break the skin, wear heavy-duty gloves over the nitrile gloves.
- c) Wear a clean, long-sleeved fluid-resistant or impermeable hospital isolation gown to protect skin and clothing.
- d) A surgical mask (or plastic face shield) and goggles or visor to protect the face, eyes, nose, and mouth from splashes of potentially infectious bodily fluids.

15.5 If an autopsy is being performed or aerosol generating procedures, refer to “CDC Collection and Submission of Postmortem Specimens from Deceased Person with Suspected COVID-19. Interim Guidance, June 2, 2020”¹.

16 Cleaning and Waste Disposal Recommendations

16.1 The following are general guidelines for cleaning and waste disposal following an autopsy of a decedent with confirmed or suspected COVID-19. Current evidence suggests that novel corona virus may remain viable for hours to days on surfaces made from a variety of materials.

16.2 Use routine cleaning and disinfection procedures (e.g., using cleaners and water to pre-clean surfaces) prior to applying disinfectants that meet the criteria for use against SARS-CoV-2, the virus that causes COVID-19.

16.3 After an autopsy of a deceased with confirmed or suspected COVID-19, the following recommendations apply for the autopsy room (and anteroom if applicable):

- a) Keep ventilation systems active while cleaning is conducted; before cleaning, wait 24 hours in a non-healthcare setting, or if you know the air changes per hour of the room or area in a healthcare setting, follow the recommended waiting time before cleaning.
 - b) Wear disposable gloves recommended by the manufacturer of the cleaner or disinfectant while cleaning and when handling cleaning or disinfecting solutions.
 - c) Dispose of gloves if they become damaged or soiled and when cleaning is completed, as described below. Never wash or reuse gloves.
 - d) Use eye protection, such as a face shield or goggles, if splashing of water, cleaner/disinfectant, or other fluids, is expected.
 - e) Wear a clean, long-sleeved fluid-resistant gown to protect skin and clothing.
 - f) Wear a disposable N95 or higher respirator if you need to clean the room or area in less than 24 hours after a suspected COVID-19 cadaver has been in the room. The N95 respirator will protect the wearer if any aerosols are created during cleaning.
 - g) Additional PPE may be required to protect workers against potential hazards associated with the cleaning and disinfectant products used and in accordance with the label instructions.
- 16.4 Use approved disinfectants that meet the criteria for use against SARS-CoV-2. Follow the manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method, contact time).
- 16.5 Clean the surface first, and then apply the disinfectant as instructed on the disinfectant manufacturer's label. Ensure adequate contact time for effective disinfection.
- 16.6 Adhere to any safety precautions or other label recommendations as directed (e.g., allowing adequate ventilation in confined areas and proper disposal of unused product or used containers).
- 16.7 Avoid using product application methods that cause splashing or generate aerosols.
- 16.8 Cleaning activities should be supervised and inspected periodically to ensure correct procedures are followed.
- 16.9 Do not use compressed air and/or water under pressure for cleaning, or any other methods that can cause splashing or might re-aerosolize infectious material.
- 16.10 Gross contamination and liquids should be collected with absorbent materials, such as towels, by staff conducting the autopsy wearing designated PPE. Gross contamination and liquids should then be disposed of as described below:
- 16.11 Use of tongs and other utensils can minimize the need for personal contact with soiled absorbent materials.
- 16.12 Large areas contaminated with body fluids should be treated with disinfectant following removal of the fluid with absorbent material. The area should then be cleaned and given a final disinfection.
- 16.13 Small amounts of liquid waste (e.g., body fluids) can be flushed or washed down ordinary sanitary drains without special procedures.
- 16.14 Hard, nonporous surfaces may then be cleaned and disinfected as described above.
- 16.15 Follow standard operating procedures for the containment and disposal of used PPE and regulated medical waste.
- 16.16 Dispose of human tissues according to routine procedures for pathological waste.
- 16.17 Clean and disinfect or autoclave non-disposable instruments using routine procedures, taking appropriate precautions with sharp objects.
- 16.18 Materials or clothing that will be laundered can be removed from the autopsy suite (or anteroom, if applicable) in a sturdy, leak-proof biohazard bag that is tied shut and not reopened. These materials should then be sent for laundering according to routine procedures.

- 16.19 Wash reusable, non-laundryable items (e.g., aprons) with a detergent solution on the warmest setting possible, rinse with water, decontaminate using disinfectant, and allow items to dry completely before next use.
- 16.20 Keep camera, telephones, computer keyboards, and other items that remain in the autopsy suite (or anteroom, if applicable) as clean as possible, but treat as if they are contaminated and handle with gloves. Wipe the items after use with appropriate approved disinfectants that meet the criteria for use against SARS-CoV-2, the virus that causes COVID-19. If being removed from the autopsy suite, ensure decontamination to the extent possible with appropriate disinfectant according to the manufacturer's recommendations prior to removal and reuse.
- 16.21 When cleaning is complete and PPE has been removed, wash hands immediately with soap and water for 20 seconds. If hands are not visibly dirty and soap and water are not available, an alcohol-based hand sanitizer that contains at least 60% alcohol may be used. However, if hands are visibly dirty, always wash hands with soap and water before using an alcohol-based hand sanitizer. Avoid touching the face with gloved or unwashed hands. Ensure that hand hygiene facilities are readily available at the point of use (e.g., at or adjacent to the PPE doffing area).

REFERENCES

- 8.1 Centres for Disease Control and Prevention. Collection and Submission of Postmortem Specimens from Deceased persons with Suspected COVID-19. Interim Guidance; June 4, 2020. Available at:
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-postmortem-specimens.html>
- 8.2 Centres for Disease Control and Prevention. Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare settings; May 18, 2020. Available at:
<https://www.cdc.gov/coronavirus/2019-n-cov/hcp/infection-control-recommendations.html>.
- 8.3 National Institute for Communicable Diseases. Coronavirus disease 2019 (COVID-19) Quick Reference for Clinical Care Workers. Available at:
<https://www.nicd.ac.za/wp-content/uploads/1010/05/COVID-19-Quick-reference-v14-25.05.2020.pdf>

Appendix 1. CONSENT FORM FOR COVID-19 TESTING OF HOME DEATHS

I, the Next of Kin/Family Member of the Deceased: -

Name & Surname

Hereby give consent to the medical practitioner/authorised person to collect a specimen (nasal swab) for COVID-19 post-mortem testing from the deceased:

Name & Surname of deceased.....

ID number of deceased.....

Date of death of deceased.....

The COVID-19 Post-mortem testing process has been explained to me. I understand the requirement for quarantine if the deceased COVID-19 results are positive, in order to protect ourselves and the community against COVID-19 infection.

Particulars of Next of Kin/Family Member
(Please print)

Name.....

Surname.....

Signature

Date.....

Relationship to the Deceased.....

Appendix 2

Process flow for collection of post mortem nasopharyngeal swabs from persons dying at home

Version 2 21 August 2020

Supporting activities

1. Specimen collection material (swabs, specimen bags and specimen request forms) may be obtained from the closest NHLS laboratory or primary health clinic or environmental health practitioner

2. The swab may be collected from the cadaver by
 -the mortician
 - the informant who takes fingerprints
 - the certifying doctor

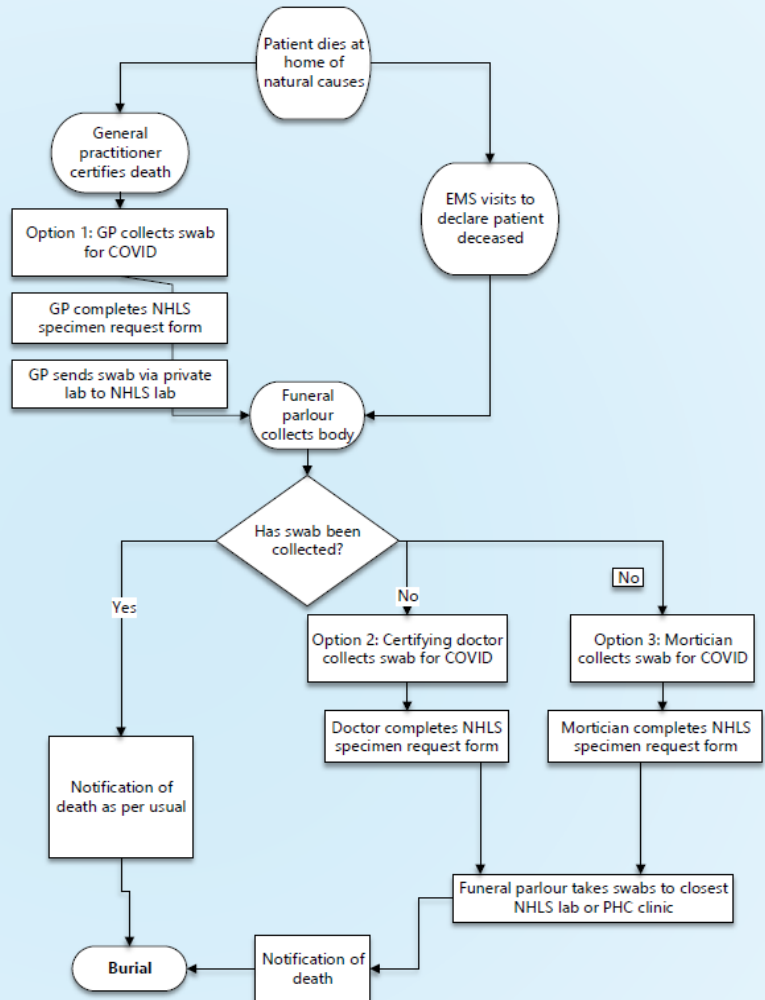
3. The swab should be delivered to closest NHLS laboratory OR primary health clinic. The swab should be refrigerated if it cannot be taken to the laboratory immediately

4. Funeral parlours are made aware of procedures

5. Appropriate persons are trained in how to complete specimen request form
 - they write 'Post mortem specimen' in the 'Ward field, and
 - they write the name of the closest PHC facility in the 'facility name field'.
 - they give a NHLS bar code sticker to the family to collect the result
 - they retain a NHLS bar code sticker so that they can obtain the result

2. NHLS is able to provide specimen collection material (c. 5000-6000 specimens per week across RSA)

3. NHLS data clerks in receiving log specimens as 'Post Mortem' using the 'ward field', and use the name of the closest PHC clinic to the funeral parlour



DEATH SUMMARY REPORT FOR ALL COVID 19 RELATED CASES		
PARTICULARS OF THE DECEASED		
Deceased ID Number: _____	Age: _____	Gender: <input type="checkbox"/> M <input type="checkbox"/> F
Name and Surname of the Deceased: _____	Address: _____ _____	
Date of Birth: ____/____/____ <small>DD / MM / YYYY</small>	Ethnicity: <input type="checkbox"/> Black <input type="checkbox"/> White <input type="checkbox"/> Coloured <input type="checkbox"/> Indian <input type="checkbox"/> Asian <input type="checkbox"/> Other	
Province: _____ District: _____ Sub-district: _____ Known COVID 19 patient: <input type="checkbox"/> Y <input type="checkbox"/> N Date of post mortem sample collection ____/____/____ (DD / MM / YYYY) Lab reference number _____ Results: <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Inconclusive Date of positive result: ____/____/____ <small>DD / MM / YYYY</small> Report reference number _____	PRESENTING SYMPTOMS (24hrs before death) <input type="checkbox"/> Fever <input type="checkbox"/> Shortness of breath <input type="checkbox"/> Cough <input type="checkbox"/> Sore throat <input type="checkbox"/> Body aches <input type="checkbox"/> Other (<i>list</i>) _____ _____ _____ _____	COMORBIDITIES <input type="checkbox"/> None <input type="checkbox"/> Diabetes <input type="checkbox"/> Hypertension <input type="checkbox"/> COPD <input type="checkbox"/> Asthma <input type="checkbox"/> Pregnancy <input type="checkbox"/> HIV <input type="checkbox"/> Obesity <input type="checkbox"/> TB <input type="checkbox"/> Cancer <input type="checkbox"/> Other (<i>list</i>) _____ _____ _____
Place of Death: _____ Date of death: ____/____/____ Time: _____ <small>DD / MM / YYYY</small>		
Specimen Collected by: _____		
Designation: _____		
Contact Number: _____		