Medical Laboratory Science Council of Nigeria

Guidelines on Safe Transportation of Infectious / Exempt Substances

Plot 1166, Muhammad N. Umar lane,
Durumi Phase II,
Garki, Abuja
Email – info@mlscn.gov.ng
Website – www.mlscn.gov.ng

Document Identification number	MLSCN/2018/005
Document name	Guidelines On Safe Transportation Of Infectious/ Exempt Substances
Version number	1.0
Produced by	MLSCN
Effective Date	March, 2018
Review Date	March, 2020
Policy Statement	Medical Laboratory Science Council of Nigeria shall ensure that processing, packaging and transportation of specimens are carried out with utmost safety precautions devoid of potential harm to all while maintaining specimen integrity.

PURPOSE

This document is to serve as a guideline for the processes involved in packaging and transportation of Specimens in line with globally accepted practices both in safety and security of the biological materials and the handlers. This guideline stresses the importance of developing a working relationship between the groups involved – the sender, the carrier and the receiver in order to provide for the safe and expeditious transport of these materials.

SCOPE

This guideline applies to all persons, facilities and other stakeholders involved in handling transportation and reception of specimens (human, animal, biologicals and others) in medical laboratories.

RATIONALE AND BACKGROUND

MLSCN as a regulatory agency has the mandate to provide a clear direction and procedure on the processing, packaging, transportation and management of the specimens in line with global best practices.

Infectious substances are packaged and transported around the world and within countries by air, road, rail and sea. In the interest of global public health, these substances need to be transported safely, timely, efficiently and legally from the place where they are collected to the place where they will be analyzed since some of these substances can be hazardous and could constitute a great risk with direct exposure.

It is therefore the responsibility of those involved in managing the packaging and transportation of these substances to minimize the risks through ensuring that adequate capacity of personnel is built, proper packaging and documentation is maintained. This guideline stipulates that anyone handling, packaging or shipping infectious substances or exempt substance must be trained, certified and MLSCN authorization obtained.

ELEMENTS OF A SHIPPING PROGRAM

i. Training program
ii. Records retention
iii. Written security and safety plans
iv. Emergency response plan
v. Written policies that ensure appropriate approvals
vi. Documented evidence of compliance with regulations

DEFINITION OF TERMS

Infectious Substances An infectious substance is defined as a substance containing a viable microorganism, such as a bacterium, virus, rickettsia, parasite or fungus, that is known or reasonably believed to cause disease in humans or animals. The term "infectious substances" will be used in this document with respect to packaging and transport situations.

Infectious substances include:

a. All cultures containing or suspected of containing an agent which may cause infection.
b. Human or animal samples that contain such an agent in quantities sufficient to cause infection, should an exposure to them occur due to a transport mishap;
c. Samples from a patient with a serious disease of unknown cause;
d. Other specimens not included above and designated as infectious by a qualified person, e.g. a Physician, Medical Laboratory Scientist, Nurse, etc.

Category A (UN 2814): An infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals. Indicative examples of substances that meet these criteria are given in **Table 1** in the Appendix**.**

Category B (UN 3373): A Category B infectious substance is one that does not meet the criteria for inclusion in Category A. A Category B infectious

substance does not cause permanent disability or life-threatening or fatal disease to humans or animals when exposure to it occurs.

Specimens

A specimen refers to any human or animal material including, but not limited to, excreta, blood and its components, tissue and tissue fluids collected for the purposes of analysis in a medical laboratory.

Exemptions

a. Substances which do not contain infectious substances or substances which are unlikely to cause disease in humans or animals.
b. Substances containing micro-organisms, which are non-pathogenic to humans or animals.
c. Substances in a form that any present pathogens have been neutralized or inactivated such that they no longer pose a health risk.
d. Environmental samples (including food and water samples), which are not considered to pose a significant risk of infection.
e. Dried blood spots, collected by applying a drop of blood onto absorbent material, or faecal occult blood screening tests and blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation.
f. MLSCN EQA/PT Panels

Transportation Regulations

International and domestic transport regulations for infectious substances are designed to prevent the release of these materials in transit to protect the public, workers, property, and the environment from the harmful effects that may occur from exposure to these materials. Protection is achieved through rigorous packaging requirements and hazard communication. Packages must be designed to withstand rough handling and other forces experienced in transportation, such as changes in air pressure and temperature, vibration, stacking, and moisture. Hazard communication includes shipping papers, labels, markings on the outside of packaging, and other information necessary to enable transport workers and emergency response personnel to correctly identify the material and respond efficiently in an emergency situation. In addition, shippers and carriers must be trained on these regulations so they can properly prepare shipments and recognize and respond to the risks posed by these materials.

Regulations governing the transfer of biological agents are designed to ensure that possession of these agents is in the best interest of the public and the nation. These regulations require documentation of personnel, facilities, justification of need and preapproval of the transfer by MLSCN.

Packaging of Specimen

Triple Packaging (UN 2007)

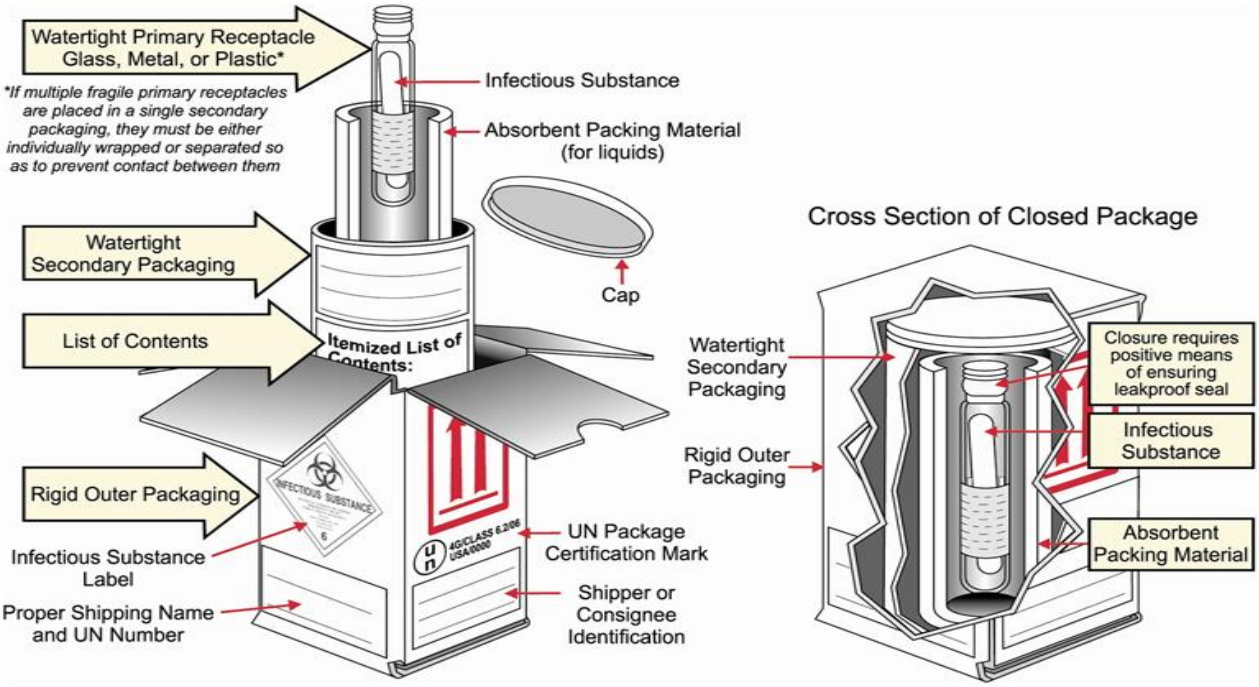


Figure 1– Triple Packaging (source - https://www.vox.com/2014/8/7/5979983/diagram-how-to-safely-ship-samples-of-ebola. accessed 26th February, 2018)

This system of packaging shall be used for all infectious substances. It consists of three (3) layers as follows -

1. **The primary sample container/ primary receptacle**

a. Must be waterproof and leak-proof.
b. Seal culture plates and screw-capped tubes with tape or Parafilm.
c. Wrap the specimen container with enough absorbent material to absorb the entire liquid contents in the event of a leakage.
d. Put the sample container in a zip-locked biohazard bag.
e. Put solid culture containers in one zip-locked bag.
f. Put liquid culture containers in two bags.
g. Pre-freeze samples that will be shipped frozen.

2. Secondary Container/ secondary receptacle

The secondary container is part of a complete packaging system.

It should:

a. Be unbreakable,
b. Be waterproof,
c. Be leak-proof and
d. have a biohazard label on the outside.

3. Outer Shipping Package

a. A certified outer shipping package is strong enough to hold the capacity and mass indicated on the bottom of the box. Choose the appropriate package.
b. It must meet the UN class 6.2 specifications and packaging instructions (PI) 602 and bear the UN Packaging Specification Marking.
c. Containers and packaging systems must be 4G Class 6.2/98 or less than three years from the year of certification design. 4G CLASS 6.2 / 99 CAN / 8-2 SAF-T-PAK U N
d. Each shipper comes with the required inner packaging and labels.
e. Do not make any substitutions or the UN-certification becomes invalid.
f. If the secondary container is reusable, you may use a refurbishment kit for each shipper.
g. Ensure there are no holes or dents and remove previous labels from recycled shippers.
h. Follow the closing instructions included with each UN-certified packaging system. If over-packs are used, the shipping package and the over-packs must be marked and labeled identically.
i. An additional label is required on the overpack: “Inner packages comply with prescribed specifications”.

Labeling

Apply labels to a flat surface without overlap or corner wrap. Hazard Labels for Dangerous Goods must be displayed on packages with infectious substances and/or dry ice.

1. Hazard Class 6.2 Infectious Substances
   Printing on the label should state:
   Etiologic agents, Biomedical Material. In case of damage or leakage notify shipper.
   Apply the Class 6.2 label on the blank diamond marked on the outside of the outer package.
2. Miscellaneous Hazard Class 9 Dry Ice. The Hazard Class 9 dry ice label is only required for shipments containing dry ice. The weight of the dry ice (in kg) is hand-written on the white portion of the label.
   Apply the Miscellaneous Hazard label on the side of the box opposite the Hazardous Substance label.
   The UN shipping name label for dry ice should be in this format:
   Carbon dioxide, solid (Dry ice) UN1845 ___kg.

   Place this label next to the Miscellaneous Hazard label.

LOCAL TRANSPORTATION OF INFECTIOUS SUBSTANCES AND ENVIRONMENTAL SAMPLES

Local transport, usually performed by a courier service, may include the transfer of specimens from a hospital, clinic, wards and other collection points to a laboratory or from one laboratory to another. Safe transport by this means is as important as air shipment. The contents of a sample should not have any possibility of escaping from the package under normal conditions of transport.

Packaging:

1. The primary sample container has to be waterproof and leak-proof.
2. Seal culture plates and screw-capped tubes with tape or Parafilm.
3. Wrap the specimen container with enough absorbent material to absorb the entire liquid contents in the event of a leakage.
4. Put the sample container in a zip-locked biohazard bag.
5. Put solid culture containers in one zip-locked bag.
6. Put liquid culture containers in two bags. This bag should be labeled with the laboratory name, address and phone number.

Labeling

1. Attach a label with the name, address and telephone number of the recipient and storage requirements.
2. Put the specimen identification form or test request form in the outside pocket of the specimen biohazard bag.
3. DO NOT put the form inside the specimen bag.
4. Transporting the primary sample container should be placed in a leak-proof, unbreakable transport box with a secure, tight-fitting cover and a biohazard label. Frozen specimens should be put into a labeled, insulated box with dry ice (for long distances). If dry ice is not available, wet ice packs are acceptable.
5. The transport box should be carried to the courier vehicle and secured in position for transport.
6. The courier vehicle should carry a spill kit with absorbent material, disposable gloves, a chlorine disinfectant, and a leak-proof waste disposal container

MLSCN EXEMPT SUBSTANCE TRANSPORTATION

The MLSCN EQA/PT Department is charged with the responsibility of administering EQA panels which fall within the category of exempt substances to participating laboratories in the scheme.

Appendix

Technical Instructions for the Safe Transport of Dangerous Goods by Air (Technical Instructions). International Civil Aviation Organization (ICAO). Applies to the shipment of infectious substances by air and is recognized in the United States and by most countries worldwide.

Dangerous Goods Regulations. International Air Transport Association (IATA). These regulations are issued by an airline association, are based on the ICAO Technical Instructions, and are followed by most airline carriers.

WHO Guidelines for the safe transport of infectious substances and diagnostic specimen.

Table 1

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED	
UN Number and Proper Shipping Name	**Microorganism**
UN 2814 Infectious substance, affecting human	Bacillus anthracis (cultures only)
	Brucella abortus (cultures only)
	Brucella melitensis (cultures only)
	Brucella suis (cultures only)
	Burkholderia mallei – Pseudomonas mallei – glanders (cultures only)
	Burkholderia pseudomallei – Pseudomonas pseudomallei (cultures only)
	Chlamydia psittaci – avian strains (cultures only)
	Clostridium botulinum (cultures only)
	Coccidioides immitis (cultures only)
	Coxiella burnetii (cultures only)
	Crimean-Congo haemorrhagic fever virus
	Dengue virus (cultures only)
	Eastern equine encephalitis virus (cultures only)
	Escherichia coli, verotoxigenic (cultures only)1
	Ebola virus
	Flexal viru
	Francisella tularensis (cultures only)
	Guanarito viru
	Hantaan virus
	Hantaviruses causing haemorrhagic fever with renal syndrome

	Hendra virus
	Hepatitis B virus (cultures only
	Herpes B virus (cultures only)
	Human immunodeficiency virus (cultures only)
	Highly pathogenic avian influenza virus (cultures only)
	Japanese Encephalitis virus (cultures only)
	Junin virus
	Kyasanur Forest disease virus
	Lassa virus
	Machupo virus
	Marburg virus
	Monkeypox viru
	Mycobacterium tuberculosis (cultures only)1
	Nipah virus

1 For surface transport (ADR) nevertheless, when the cultures are intended for diagnostic or clinical purposes, they may be classified as infectious substances of Category B.

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED	
	Omsk haemorrhagic fever virus
	Poliovirus (cultures only)
	Rabies virus (cultures only)
	Rickettsia prowazekii (cultures only)
	Rickettsia rickettsii (cultures only)
	Rift Valley fever virus (cultures only)
	Russian spring-summer encephalitis virus (cultures only)
	Sabia virus
	Shigella dysenteriae type 1 (cultures only)1
	Tick-borne encephalitis virus (cultures only)
	Variola virus
	Venezuelan equine encephalitis virus (cultures only)
	West Nile virus (cultures only)
	Yellow fever virus (cultures only)
	Yersinia pestis (cultures only)
UN 2900 Infectious substance, affecting animals only African	African swine fever virus (cultures only)
	Avian paramyxovirus Type 1 – Velogenic Newcastle disease virus (cultures only)
	Classical swine fever virus (cultures only)
	Foot and mouth disease virus (cultures only)

	Lumpy skin disease virus (cultures only)
	Mycoplasma mycoides – contagious bovine pleuropneumonia (cultures only)
	Peste des petits ruminants virus (cultures only)
	Rinderpest virus (cultures only)
	Sheep-pox virus (cultures only)
	Goatpox virus (cultures only)
	Swine vesicular disease virus (cultures only)
	Vesicular stomatitis virus (cultures only)

1 For surface transport (ADR) nevertheless, when the cultures are intended for diagnostic or clinical purposes, they may be classified as infectious substances of Category B.

Table 1B.

Packing Instruction P620

Infectious substances in Category A and designated as UN 2814 or UN 2900 may only be transported in packaging that meets the United Nations class 6.2 specifications and complies with Packing Instruction P620, which is reproduced below. The various provisions mentioned are set out in the United Nations Model Regulations.

NOTE: Variations applying to air transport are highlighted in bold letters.

P620	**PACKING INSTRUCTION**	**P620**
This instruction applies to UN 2814 and UN 2900.		
The following packagings are authorized provided the special packing provisions described below are met: Packagings meeting the requirements of Chapter 6.3 and approved accordingly consisting of: (a) Inner packagings comprising: (i) leakproof primary receptacle(s); (ii) a leakproof secondary packaging; (iii) other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple **fragile** primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them; (b) A rigid outer packaging. Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2). The smallest external dimension shall be not less than 100 mm **(4 in).**		
Additional requirements: 1. Inner packagings' containing infectious substances shall not be consolidated with inner packagings' containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions such an overpack may contain dry ice.		

2. Other than for exceptional consignments, e.g. whole organs which require special packaging, the following additional requirements shall apply:

(a) Substances consigned at ambient temperatures or at a higher temperature. Primary receptacles shall be of glass, metal or plastics. Positive means of ensuring a leakproof seal shall be provided, e.g. a heat seal, a skirted stopper or a metal crimp seal. If screw caps are used, they shall be secured by positive means, e.g., tape, paraffin sealing tape or manufactured locking closure;

(b) Substances consigned refrigerated or frozen. Ice, dry ice or other refrigerant shall be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.3.3. Interior supports shall be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack shall be leakproof. If dry ice is used, the outer packaging or overpack shall permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used;

(c) Substances consigned in liquid nitrogen. Plastics primary receptacles capable of withstanding very low temperature shall be used. The secondary packaging shall also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen shall also be fulfilled. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the liquid nitrogen;

(d) Lyophilized substances may also be transported in primary receptacles that are flame-sealed glass ampoules or rubber-stoppered glass vials fitted with metal seals.

3. Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range -40 °C to +55 °C (-40 °F to +130 °F).

4. Other dangerous goods shall not be packed in the same packaging as Division 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 ml or less of dangerous goods included in Classes 3 (flammable liquids), 8 (corrosive substances) or 9 (miscellaneous dangerous substances and articles, including environmentally hazardous substances) may be packed in each primary receptacle containing infectious substances. These small quantities of dangerous goods of Classes 3, 8 or 9 are not subject to any additional requirements of these Regulations when packed in accordance with this packing instruction.

5. Alternative packagings for the transport of animal material may be authorized by the competent authority in accordance with the provisions of 4.1.3.7.

Special packing provisions

1. Shippers of infectious substances shall ensure that packages are prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during transport.

2. An itemized list of contents shall be enclosed between the secondary packaging and the outer packaging, When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in category A, the words "suspected category A infectious substance" shall be shown, in parenthesis, following the proper shipping name on the document inside the outer packaging.

3. Before an empty packaging is returned to the shipper, or sent elsewhere, it must be disinfected or sterilized to nullify any hazard and any label or marking indicating that it had contained an infectious substance must be removed or obliterated.

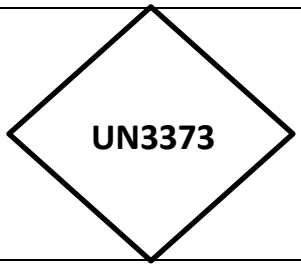
Table 1.C.

Packing Instruction P650

The text of United Nations Packing Instruction P650, in use for the transport of infectious substances in category B assigned to UN 3373 by all surface modes of transport is reproduced below. The shaded text on the right-hand side indicates the ICAO variations to these instructions that apply to the transport by air. The various provisions mentioned are set out in the United Nations Model Regulations.

NOTE: Variations applying to air transport are displayed on a shaded grey background.

<table>
<tr><th colspan="2">P620 PACKING INSTRUCTION P620</th></tr>
<tr><td colspan="2"></td></tr>
<tr><td>This instruction applies to UN 3373</td><td>On passenger and cargo aircraft, and cargo aircraft only (CAO).</td></tr>
<tr><td colspan="2">(1) The packaging shall be of good quality, strong enough to withstand the shocks and loadings normally encountered during transport, including trans-shipment between cargo transport units and between transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings shall be constructed and closed to prevent any loss of contents that might be caused under normal conditions of transport by vibration or by changes in temperature, humidity or pressure.</td></tr>
<tr><td>(2) The packaging shall consist of at least three components:
(a) a primary receptacle,
(b) a secondary packaging, and
(c) an outer packaging of which either the secondary or the outer packaging shall be rigid</td><td>The outer packaging must be rigid</td></tr>
<tr><td colspan="2">(3) Primary receptacles shall be packed in secondary packagings in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not compromise the integrity of the cushioning material or of the outer packaging.</td></tr>
<tr><td colspan="2">(4) For transport, the mark illustrated below shall be displayed on the external surface of the outer packaging on a background of a contrasting colour and shall be clearly visible and legible. The mark shall be in the form of a square set at an angle of 45° (diamond-shaped) with each side having a length of at least 50 mm; the width of the line shall be at least 2 mm and the letters and numbers shall be at least 6 mm high. The proper shipping name “BIOLOGICAL SUBSTANCE, CATEGORY B” in letters at least 6 mm high shall be marked on the outer packaging adjacent to the diamond-shaped mark.</td></tr>
</table>

<table>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">(5) At least one surface of the outer packaging must have a minimum dimension of 100 mm × 100 mm.</td></tr>
<tr><td colspan="2">(6) The completed package shall be capable of successfully passing the drop test in 6.3.5.3 as specified in 6.3.5.2 of these Regulations at a height of 1.2 m. Following the appropriate drop sequence, there shall be no leakage from the primary receptacle(s) which shall remain protected by absorbent material, when required, in the secondary packaging.</td></tr>
<tr><td>(7) For liquid substances
(a) The primary receptacle(s) shall be leakproof;</td><td>and must not contain more than 1 litre;</td></tr>
<tr><td colspan="2">(b) The secondary packaging shall be leakproof;
(c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them;
(d) Absorbent material shall be placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;</td></tr>
<tr><td>(e) The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar).</td><td>in the range of -40 °C to +55 °C (-40 °F to +130 °F).

(f) The outer package must not contain more than 4 litres. This quantity excludes ice, dry ice or liquid nitrogen when used to keep specimens cold.</td></tr>
<tr><td>(8) For solid substances
(a) The primary receptacle(s) shall be siftproof;</td><td>and must not exceed the outer packaging mass limit;</td></tr>
<tr><td>(b) The secondary packaging shall be siftproof;
(c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them.

(e) If there is any doubt as to whether residual liquid may be present in the primary receptacle or not during transport, then a packaging suitable for liquids, including absorbent materials, shall be used.</td><td>(d) Except for packages containing body parts, organs or whole bodies, the outer package must not contain more than 4 kg. This quantity excludes ice, dry ice or liquid nitrogen when used to keep specimens cold;</td></tr>
<tr><td colspan="2">(9) Refrigerated or frozen specimens: Ice, dry ice and liquid nitrogen
(a) When dry ice or liquid nitrogen is used as a coolant, the requirements of 5.5.3 shall apply. When used, ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packagings in the original position. If ice is used, the outside packaging or overpack shall be leakproof.
(b) The primary receptacle and the secondary packaging shall maintain their integrity at the</td></tr>
</table>

<table>
<tr><td colspan="2">temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.
(10) When packages are placed in an overpack, the package markings required by this packing instruction shall either be clearly visible or be reproduced on the outside of the overpack.</td></tr>
<tr><td>(11) Infectious substances assigned to UN 3373 which are packed and marked in accordance with this packing instruction are not subject to any other requirement in these Regulations.</td><td>Infectious substances assigned to UN 3373 that are packed and marked in accordance with this packing instruction are not subject to any other requirement in these Instructions except for the following:
(a) the name and address of the shipper and the receiver (consignee) must be provided on each package;</td></tr>
<tr><td></td><td>(b) the name and telephone number of a person responsible must be provided on a written document (such as an air waybill) or on the package;
(c) classification must be in accordance with provision 2;6.3.2 of the ICAO Technical Instructions;
(d) the incident reporting requirements in provision 7;4.4 of the ICAO Technical Instructions must be met (these refer to operators);
(e) the inspection for damage or leakage requirements in provisions 7;3.1.3 and 7;3.1.4 of the ICAO Technical Instructions (these refer to operators);
(f) passengers and crew members are prohibited from transporting infectious substances either as, or in, carry-on baggage or checked baggage or on their person.</td></tr>
<tr><td colspan="2">(12) Clear instructions on filling and closing such packages shall be provided by packaging manufacturers and subsequent distributors to the consignor or to the person who prepares the package (e.g. patient) to enable the package to be correctly prepared for transport</td></tr>
<tr><td colspan="2">(13) Other dangerous goods shall not be packed in the same packaging as Division 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 ml or less of dangerous goods included in Classes 3 (flammable liquids), 8 (corrosives) or 9 (miscellaneous dangerous substances and articles, including environmentally hazardous substances) may be packed in each primary receptacle containing infectious substances. When these small quantities of dangerous goods are packed with infectious substances in accordance with this packing instruction no other requirements in these Instructions need be met.
Additional requirement:
Alternative packagings' for the transport of animal material may be authorized by the competent authority in accordance with the national/international provisions.</td></tr>
</table>

Table 1.D.

List of dangerous goods related to the transport of infectious substances

								Passenger and cargo aircraft				Cargo aircraft only	
								Limited quantity					
Proper Shipping Name UN No	UN No.	Class or Div	Sub Risk	Hazard Labels	State Var	SP	UN Pkg Grp	Pkg Inst	Max net Qty/ Pk	Pkg Inst	Max net Qty/ Pkg	Pkg Ins	Max net Qty/ Pkg
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Aviation regulated liquid, n.o.s.	3334	9		Misc		A27		Y964	30Kg G	964	450	964	450 L
Biological substance, Category B	3373	6.2		None	GB5					See 650		See 650	
(Bio) medical waste	3291	6.2		Inf.		A117	II			622	No Limit	622	No Limit
Carbon dioxide, solid Dry ice	1845	9		Misc		A48 A151				954	200Kg	954	200 L
Clinical waste, unspecified, n.o.s	3291	6.2		Inf		A117	II			622	No Limit	622	No Limit
Ethanol Ethanol solution Ethyl alcohol Ethyl alcohol solution	1170	3		Flamm Liq.		A3 A58 A180	II III	Y341 Y344	1 Litre 10Litres	353 355	5 Litres 60 Litres	364 366	60 L 220L
Formaldehyde solution, with not less than 25% formaldehyde	2209	8		Consv	US 4		III	Y841	1 Litre	852	5 Litres	856	60 L
Formaldehyde solution, flammable	1198	3	8	Flamm Liq. & C		A180	III	Y342	1 Litre	354	5 Litres	365	60 L
Genetically modified micro-organisms Genetically modified	3245	9		Misc		A47				959	No Limit	959	No Limit

Inforganisms													
InfInfectious substance, affecting animals only	**2900**	**6.2**		**Inf**	**AU 3; CA 8; VU 2**	**A81 A140**				**620**	**50ml or 50g**	**620**	**40L or 40Kg**
Infectious substance, affecting humans	**2814**	**6.2**		**Inf**	**AU 3; CA 8; VU 2**	**A81 A140**				**620**	**50ml or 50g**	**620**	**40L or 40Kg**
Medical waste, n.o.s	**3291**	**6.2**		**Inf**		**A117**	**II**			**622**	**No Limit**	**622**	**No Limit**
Methanol	**1230**	**3**	**6.1**	**Flamm**		**A104 A113**	**II**	**Y341**	**1 Litre**	**352**	**1 Litre**	**364**	**60 L**
Nitrogen, refrigerated liquid	**1977**	**2.2**		**Non-flamm gas**		**A152**				**202**	**50Kg**	**202**	**500Kg**
Regulated medical waste, n.o.s.	**3291**	**6.2**		**Inf.**		**A117**	**II**			**622**	**No Limit**	**622**	**No Limit**

Special Provisions applicable to certain substances

The following Special Provisions are listed according to ICAO (UN):

A3 (223) If the chemical or physical properties of a substance covered by this description are such that, when tested, it does not meet the established defining criteria for the class or division listed in column 3, or any other class or division, it is not subject to Dangerous Goods Regulations.

A27 (276) This includes any substance which is not covered by any of the other classes but which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

A47 (219) Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs) packed and marked in accordance with Packing Instruction 959 are not subject to any other requirements in the Dangerous Goods Regulations.

If GMMOs and GMOs meet the definition in 2.6 of a toxic substance or an infections substance and meet the criteria for inclusion in Division 6.1 or 6.2, the requirements in the Dangerous Goods Regulations for transporting toxic substances or infectious substances apply.

A48 Packaging tests are not considered necessary.

A58 (144) An aqueous solution containing not more than 24% alcohol by volume is not subject to Dangerous Goods Regulations.

A81 The quantity limits shown in columns 12 and 14 do not apply to body parts, organs or whole bodies.

A104 A toxic subsidiary risk label, although not required by Dangerous Goods Regulations, may be applied.

A113 (279) The substance is assigned to this classification or packing group based on human experience rather than the strict application of classification criteria set out in the Dangerous Goods Regulations.

A117: Wastes transported under UN 3291 are wastes derived from the medical treatment of humans or animals or from bio-research, where there is a relatively low probability that infectious substances are present. Waste infectious substances which can be specified must be assigned to UN 2814 or UN 2900. Decontaminated wastes which previously contained infectious substances may be considered as not subject to Dangerous Goods Regulations unless the criteria of another class or division are met.

A140 (318) For the purposes of documentation, the proper shipping name must be supplemented with the technical name. Technical names need not be shown on the package. When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in category A and assignment to UN 2814 or UN 2900, the words "suspected category A infectioussubstance" must be shown, in parenthesis, following the proper shipping name on the transport document, but not on the outer packagings.

34

WHO/HSE/GCR/2015.2 Guidance on regulations for the transport of infectious substances 2015–2016

A151 When dry ice is used as a refrigerant for other than dangerous goods loaded in a unit load device or other type of pallet, the quantity limits per package shown in columns 12 and 14 of the table in Annex 5 for dry ice do notapply. In such case, the unit load device or other type of pallet must be identified to the operator and must allow the venting of the carbon dioxide gas to prevent a dangerous build-up of pressure.

A152 Insulated packagings conforming to the requirements of Packing Instruction 202 containing refrigerated liquid nitrogen fully absorbed in a porous material are not subject to Dangerous Goods Regulations provided the design of the insulated packaging would not allow the build-up of pressure

within the container and would not permit the release of any refrigerated liquid nitrogen irrespective of the orientation of the insulated packaging and any outer packaging or overpack used is closed in a way that will not allow the build-up of pressure within that packaging or overpack. When used to contain substances not subject to Dangerous Goods Regulations, the words "Not Restricted" and the special provision number A152 must be provided on the air waybill when an air waybill is issued.

A180 Non-infectious specimens, such as specimens of mammals, birds, amphibians, reptiles, fish, insects and other invertebrates containing small quantities of UN 1170 (Ethanol), UN 1198 (Formaldehyde solution, flammable), UN 1987 (Alcohols, n.o.s.) or UN 1219 (Isopropanol) are not subject to Dangerous Goods Regulations provided the following packing and marking requirements are met:

a) specimens are: 1. wrapped in paper towel and/or cheesecloth moistened with alcohol or an alcohol solution and then placed in a plastic bag that is heat-sealed. Any free liquid in the bag must not exceed 30 ml; or 2. placed in vials or other rigid containers with no more than 30 ml of alcohol or an alcohol solution;
b) the prepared specimens are then placed in a plastic bag that is then heat-sealed;

c) the bagged specimens are then placed inside another plastic bag with absorbent material then heat-sealed;

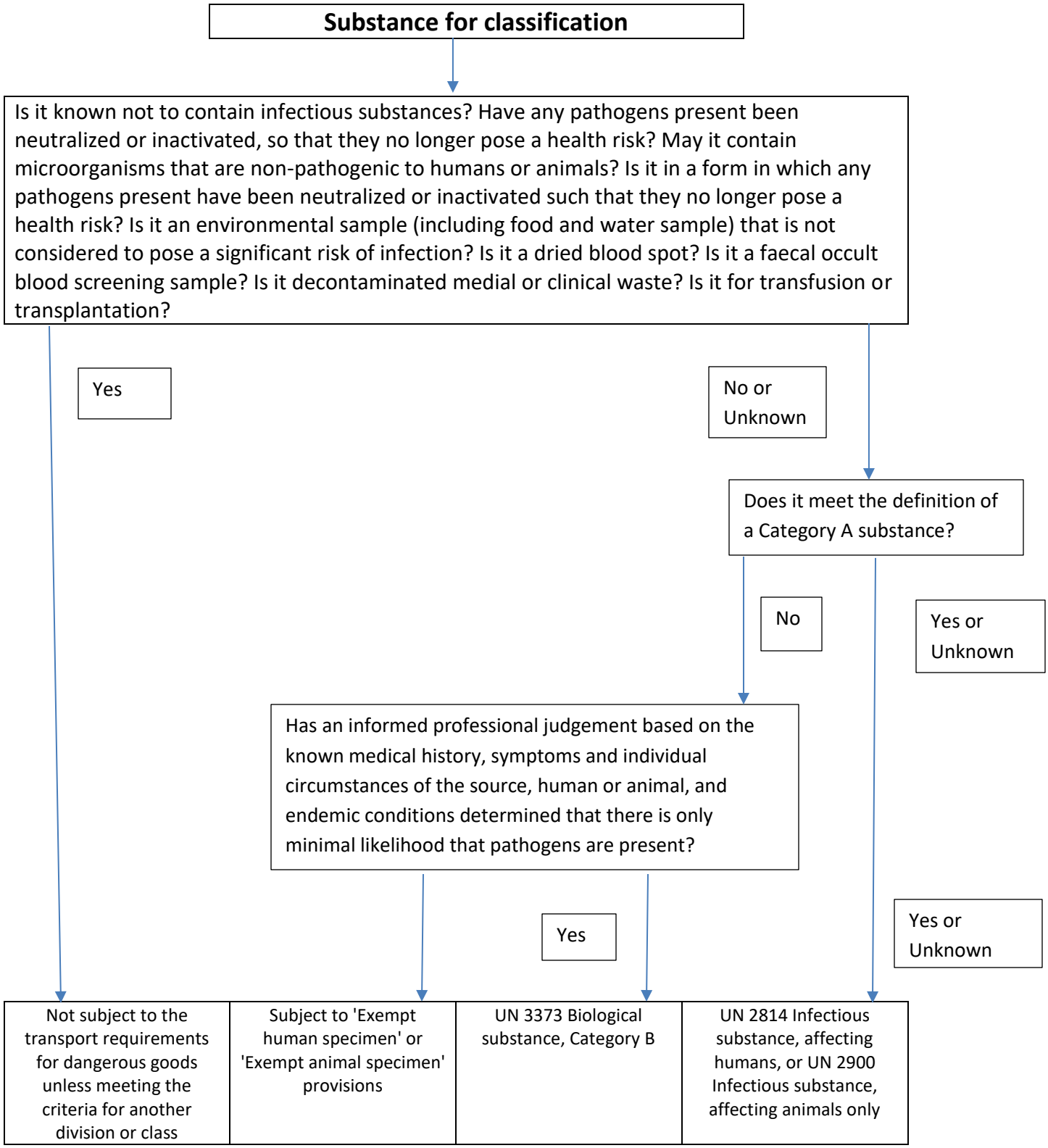
d) the finished bag is then placed in a strong outer packaging with suitable cushioning material;

e) the total quantity of flammable liquid per outer packaging must not exceed 1 litre; and

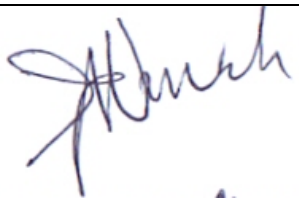
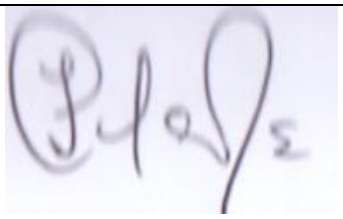
f) the completed package is marked "scientific research specimens, not restricted. Special Provision A180 applies".

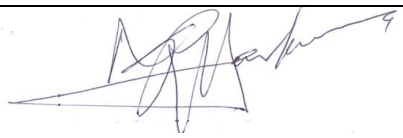
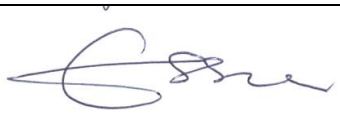
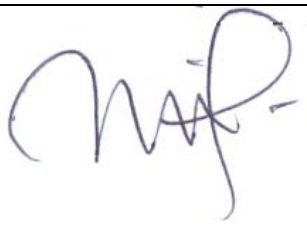
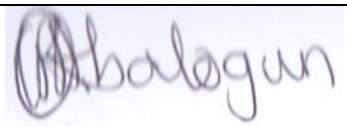
The words "not restricted" and the special provision number A180 must be provided on the air waybill when an air waybill is issued.

Flowchart for the classification of infectious substances and patient specimens



Contributors

S/N	Participant Name	Organization	Signature
1	ERHABOR, Tosan	Medical Laboratory Science Council of Nigeria	
2	AZEEZ, M. M.	Medical Laboratory Science Council of Nigeria	
3	UDO, Stella N.	Medical Laboratory Science Council of Nigeria	
4	NWOKAH, Easter G.	Rivers State University, Port Harcourt	
5	BARDE, Joshua B.	NEQAL Laboratory/ Medical Laboratory Science Council of Nigeria	
6	ADEOYE, Felix (Col.)	HIFASS	
7	UCHUNO, Gregory	Medical Laboratory Science Council of Nigeria	

8	AIKPITANYI- IDUITUA, G. A.	Medical Laboratory Science Council of Nigeria	
9	RUBAINU, Manason G.	Peak Medical Laboratories Ltd.	
10	ESSIEN, Victor	Medical Laboratory Science Council of Nigeria	
11	OFFUTALU, Paulinus N.	PHIVDS Laboratory, Medical Laboratory Science Council of Nigeria	
12	IFEANYI, CASMIR I. C. (Dr.)	University of Abuja	
13	IBANG, Livinus	Nigerian Biological Safety Association (NIBSA)	
14	BALAGUN. Oyebimpe	Institute of Human Virology, Nigerian	
15	ELENDU, Humphrey Ndubueze	Medical Laboratory Science Council of Nigeria	

16	AKINWALE, Abayomi Air Cdre (Rtd.)	USDOD Nigeria	
17	Tubi Abiola	NTBLCP