Lassa Fever

World Health Organization

Operational Support & Logistics
Disease Commodity Packages

Agent's Biosafety Level: BSL4
Epidemic Potential: Medium

Last Update: 21 September 2018

Lassa Fever [LINK]
Managing Epidemics Handbook [LINK]

SURVEILLANCE	Sample Collection	Diagnosis	
Definitive diagnosis requires testing that is available only in reference laboratories. Laboratory specimens may be hazardous and must be handled with extreme care.	Blood & Nasopharyngeal samples	Polymerase Chain Reaction (PCR)	Immunoassay
		1 RT-PCR Non-prequalified (NPQ) with 2 targets (GPC gene and L gene)	Several in-house IgM/IgG ELISAs

Note: Many diagnostics supplies are also used for Case Management purposes, but have been included only in Surveillance.

Medical Device List. [LINK]

PREVENTION & CONTROL	Vector Control	Infection Protection & Control (IPC)	Post Exposure Propyylaxsis
Humans get primarily infected through exposure to rats' urine or faeces. Human to human transmssion occurs through direct contact with bodily fluids of infected persons, therefore strict IPC measures with appropriate PPE are key to control outbreaks.	Rodents	Personal Protective Equipment (PPE) for screening (standard) in health facilities & for teams conducting safe and dignified burials	Oral Ribavirin. On outbreak-specific basis, and as per most recent guidance in the R&D Blueprint.
		PPE Guidelines [LINK]	Therapeutic Workshop Document [LINK]

R&D Blueprint [LINK]

CASE MANAGEMENT	Treatment		Personal Protective Equipment (PPE)
	Aetiological	Supportive	
Isolated patients must be placed in intensive care and receive aetiological & supportive treatment.	Ribavirin IV, Lassa Treatment in pipeline (Oral presentation, IV presentation in production),	IV Fluids critical Intensive care for isolated patient Pain & Fever	PPE for Treatment in Healthcare Facilities
	Therapeutic Workshop Document [LINK]		

Key outbreak control activities considered for material supply

- **Rapid diagnostics tests** to improve disease identification
- **Antiviral treatment** to reduce mortality
- **Supportive treatment** (hydration & fever/pain relief) to reduce mortality
- **Personal Protective Equipment** and material for the establishment of IPC measures at health care level to reduce transmission
- **Personal Protective Equipment** and material for the execution of **safe and dignified burials** to reduce transmission

Note: Products for Surveillance, Prevention & Control, and Case Management are undergoing rapid and continous development and refinement. For greater clarity, please refer to most recent applicable WHO technical guidance.

INTERVENTION		COMMODITY	TECHNICAL DESCRIPTION	
SURVEILLANCE	Sample Collection	Triple packaging boxes	Triple packaging boxes for transport	Guidance on regulations for Transport of Infectious Substances 2017 - 2018 [LINK]
		Viral Transport Medium	Medium for specimen to transport to laboratory	Interim Guideline [LINK]
		Tubes, blood collection, EDTA	Vacuum tube used for blood collection with EDTA, sterile, capped with vacuum seal. Material: plastic. 4 ml and 6 ml	
		Tubes, blood collection, plain/dry	Vacuum tube used for plain/dry blood collection without anticoagulant, sterile, capped with vacuum seal. Material: plastic. 4 ml and 6 ml	
		Sharps container boxes	Puncture resistant container for collection and disposing of used, disposable and auto-disable syringes, needles. 5 L capacity accommodating approximately 100 syringes. Boxes prominently marked.	• WHO performance specification E10/IC.1 • WHO/UNICEF standard E10/IC.2 or equivalent
	Diagnostics	Criteria for selection of specific diagnostic tests may include historical efficacy, adherence to any existing Target Product Profiles, ease of use, necessary throughput, distribution and logistics requirements, and manufacturer production capacity. For some pathogens, consideration may need to be given to the presence of mutations in targeted gene sequences or proteins. WHO can advise on the selection of tests on a case by case basis as determined by a specific event.		
	Temperature Screening	Thermometer, Infrared	Handheld battery-powered electronic instrument designed to estimate body temperature od a site on skin (e.g. forehead) non-invasively, quickly without touching. A sensor can be cleaned easily by each use with wiping by disinfectant or sterilisable cover.	• ISO 80601-2-56:2009 • ISO 80601-2-59 Ed. 1.0:2008 • ASTM E1104-98(2003) • ASTM E1965-98(2009) • ASTM E1112-00(2011) • JIS T 4207:2005 • or equivalent WHO Core - Thermometers, electronic, infrared [LINK]
		Gloves, examination	Gloves, examination, nitrile, powder-free, non-sterile. Cuff length preferably reach mid-forearm (eg. minimum 280mm total length. Sizes, S, M, L Outer glove should have long cuffs, reaching well above the wrist, ideally to mid-forearm. Inner glove should be worn under the cuff of the gown/coveralls (and under any thumb/finger loop) whereas the outer glove should be worn over the cuff of the gown/coveralls.	• EU standard directive 93/42/EEC Class I, EN 455, • EU standard directive 89/686/EEC Category III, EN 374, • ANSI/ISEA 105-2011, • ASTM D6319-10 • or equivalent

PREVENTION & CONTROL	PPE - Standard	Gloves, surgical, length to forearm large (longer than examination gloves)	Gloves, surgical, nitrile, powder-free, single use. Outer glove should have long cuffs, reaching well above the wrist, ideally to mid-forearm. Inner glove should be worn under the cuff of the gown/coveralls (and under any thumb/finger loop) whereas the outer glove should be worn over the cuff of the gown/coveralls. Sizes 5 to 8.5	• EU standard directive 93/42/EEC Class I, EN 455, • ANSI/ISEA 105-2011, • ASTM 6319-10 • or equivalent
		Face mask, particulate respirator, grade N95 or higher	Fluid resistant particulate respirator. Surgical N95 respirator or higher High fluid resistance, Good breathability, Internal and external faces should be clearly identified, Structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)	"Surgical N95 respirator" cleared by the US FDA and NIOSH, or equivalent • Fluid resistant surgical N95 respirator with minimum 80 mm Hg pressure based on ASTM F1862, ISO 22609 , or equivalent
		Gown	Single use, fluid resistant, disposable, length mid-calf to cover the top of the boots, light colours preferable to better detect possible contamination, thumb/finger loops or elastic cuff to anchor sleeves in place.	• Option 1: fluid penetration resistant: EN 13795 high performance, or AAMI PB70 level 3 performance or above, or equivalent • Option 2: blood borne pathogens penetration resistant: AAMI PB70 level 4 performance, or (EN 14126-B) and partial body protection (EN 13034 or EN 14605), or equivalent
	Burial Teams	Gloves, heavy duty	Covering forearm. Fabric: cotton or polyester, rubber coating, waterproof, and acid resistant, minimum cuff length 150mm	• EU standard directive 89/686/EEC Category III, • EN 374 (AS/NZS 2161.10.1.2005) chemical resistance for AKL • EN 374 (AS/NZS 2161.10.1.2005) for biohazards Level 3 performance, or above • EN 388 (AS/NZS 2161.10.3.2005) 3111 for abrasion, blade cut, tear and puncture, or above • EN 420:2004+A1:2009 or equivalent, or above
		Face mask, particulate respirator, grade N95 or higher	Fluid resistant particulate respirator. Surgical N95 respirator or higher High fluid resistance, Good breathability, Internal and external faces should be clearly identified, Structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)	"Surgical N95 respirator" cleared by the US FDA and NIOSH, or equivalent • Fluid resistant surgical N95 respirator with minimum 80 mm Hg pressure based on ASTM F1862, ISO 22609 , or equivalent
		Goggles, protective	Good seal with the skin of the face, Flexible PVC frame to easily fit with all face contours with even pressure, Enclose eyes and the surrounding areas, Accomodate wearers with prescription glasses, Clear plastic lens with fog and scratch resistant treatments, Adjustable band to secure firmly so as not to become loose during clinical activity, Indirect venting to avoid fogging, May be re-usable (provided appropriate arrangements for decontamination are in place) or disposable.	• EU standard directive 86/686/EEC, EN 166/2002, • ANSI/ISEA Z87.1-2010, or equivalent
		Coverall	Single use, light colours preferable to better detect possible contamination, thumb/finger loops to anchor sleeves in place, good freedom of movement. Sizes: M, L, XL	• Option 1: blood and body fluid penetration resistant: meets or exceeds ISO 16603 class 3 or above exposure pressure, or equivalent • Option 2: blood-borne pathogens penetration resistant:meets or exceeds ISO 16604 class 2 or above exposure pressure, or equivalent
		Scrubs, tops	Tunic/tops, woven, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.	
		Scrubs, pants	Trouser/pants, woven, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown	
		Apron, heavy duty, non-woven	Straight apron with bib, Fabric: 100% polyester with PVC coating, or 100% PVC, or 100% rubber, or other fluid resistant material, Waterproof, Sewn strap for neck and back fastening Minimum basis weight: 300g/m2 covering size: 70-90 cm (width) X 120-150cm (height) Reusable (provided appropriate arrangements for decontamination are in place)	May comply with • EN ISO 13688:2013 • EN 14126-B and partial body protection (EN 13034 or EN 14605) or equivalent
		Boot, rubber	Non-slip sole pattern, PVC or polyurethane sole which is completely sealed and waterproof, Knee-high in order be higher than the bottom edge of the gown, Range of sizes available to improve comfort and avoid trauma to the feet, Materials of construction include rubber, PVC, neoprene, nitrile, polyurethane, Favor light colours to better identify possible contaminations.	
		Bio-hazardous bag	Disposal bag for bio-hazardous waste, 30x50cm, with "Bio Hazard" print, autoclavable polypropylene. 50 or 70 micron thickness	
		Body bag	Made of linear enforced, U-shape zipper and 2 zipper pulls with tie ribs. adult size 250x120cm Protector Body Bag specifications: • 6 handles • Impermeable, linear reinforced LLDPE, LDPE, EVA, PEVA, (avoid PVC), minimum thickness 400 microns; • Should be able to hold 100-125 kilos (200-250 lbs), • Should contain no chlorides: burning of chlorides pollute the environment and can cause damage to retort chambers. Body bags should be non carcinogenic to health of funeral workers when used for cremations. • At least 6 handles included in the body bag to allow burial team to hand carry it safely • Heat-sealed: insure superior strength and safety, • Provide full containment of blood borne pathogens • Cracking point of 25 - 32 degrees below zero • Shelf life: minimum 10 years • Bag and hands should be white color	

CASE MANAGEMENT	Aetiological Treatment	Ribavirin	Ribavirin IV, 1000mg dissolved in 10ml phosphate buffer solution, vial.	
	Supportive Treatment	Compound Sodium Lactate Solution	Compound solution of sodium lactate (Ringer's lactate), injection solution, w/o IV set and needle, 1000ml	
		Infusion giving set	Infusion giving set, with airinlet and needle, sterile, single-use	
		Paracetamol	Paracetamol, 500mg, tablets	
	PPE Health Care Facilities	Gloves, examination	Gloves, examination, nitrile, powder-free, non-sterile. Cuff length preferably reach mid-forearm (eg. minimum 280mm total length. Sizes, S, M, L Outer glove should have long cuffs, reaching well above the wrist, ideally to mid-forearm. Inner glove should be worn under the cuff of the gown/coveralls (and under any thumb/finger loop) whereas the outer glove should be worn over the cuff of the gown/coveralls.	• EU standard directive 93/42/EEC Class I, EN 455, • EU standard directive 89/686/EEC Category III, EN 374, • ANSI/ISEA 105-2011, • ASTM D6319-10 • or equivalent
		Gloves, surgical, length to forearm large (longer than examination gloves)	Gloves, surgical, nitrile, powder-free, single use. Outer glove should have long cuffs, reaching well above the wrist, ideally to mid-forearm. Inner glove should be worn under the cuff of the gown/coveralls (and under any thumb/finger loop) whereas the outer glove should be worn over the cuff of the gown/coveralls. Sizes 5 to 8.5	• EU standard directive 93/42/EEC Class I, EN 455, • ANSI/ISEA 105-2011, • ASTM 6319-10 • or equivalent
		Face shield	Made of clear plastic and provides good visibility to both the wearer and the patient, Adjustable band to attach firmly around the head and fit snuggly against the forehead, Fog resistant (preferable), Completely cover the sides and length of the face, May be re-usable (made of robust material which can be cleaned and disinfected) or disposable.	• EU standard directive 86/686/EEC, EN 166/2002, • ANSI/ISEA Z87.1-2010, or equivalent
		Coverall	Single use, light colours preferable to better detect possible contamination, thumb/finger loops to anchor sleeves in place, good freedom of movement. Sizes: M, L, XL	• Option 1: blood and body fluid penetration resistant: meets or exceeds ISO 16603 class 3 or above exposure pressure, or equivalent • Option 2: blood-borne pathogens penetration resistant:meets or exceeds ISO 16604 class 2 or above exposure pressure, or equivalent
		Face mask, particulate respirator, grade N95 or higher	Fluid resistant particulate respirator. Surgical N95 respirator or higher High fluid resistance, Good breathability, Internal and external faces should be clearly identified, Structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)	"Surgical N95 respirator" cleared by the US FDA and NIOSH, or equivalent • Fluid resistant surgical N95 respirator with minimum 80 mm Hg pressure based on ASTM F1862, ISO 22609 , or equivalent
		Mask, surgical	Medical/surgical mask, high fluid resistance, good breathability, internal and external faces should be clearly identified, structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)	EN 14683 Type IIR performance ASTM F2100 level 2 or level 3 or equivalent; • Fluid resistance at minimum 120 mmHg pressure based on ASTM F1862-07, ISO 22609, or equivalent • Breathability: MIL–M-36945C, EN 14683 annex C, or equivalent • Filtration efficiency: ASTM F2101, EN14683 annex B, or equivalent
		Scrubs, tops	Tunic/tops, woven, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.	
		Scrubs, pants	Trouser/pants, woven, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown	
		Gown	Single use, fluid resistant, disposable, length mid-calf to cover the top of the boots, light colours preferable to better detect possible contamination, thumb/finger loops or elastic cuff to anchor sleeves in place.	• Option 1: fluid penetration resistant: EN 13795 high performance, or AAMI PB70 level 3 performance or above, or equivalent • Option 2: blood borne pathogens penetration resistant: AAMI PB70 level 4 performance, or (EN 14126-B) and partial body protection (EN 13034 or EN 14605), or equivalent
		Head cover	single use, fluid resistant, adjustable and should stay securely in place once adjusted, facial opening constructed without elastic, cover reaches upper part of the gown	
		Boot, rubber	Non-slip sole pattern, PVC or polyurethane sole which is completely sealed and waterproof, Knee-high in order be higher than the bottom edge of the gown, Range of sizes available to improve comfort and avoid trauma to the feet, Materials of construction include rubber, PVC, neoprene, nitrile, polyurethane, Favor light colours to better identify possible contaminations.	
		Goggles, protective	Good seal with the skin of the face, Flexible PVC frame to easily fit with all face contours with even pressure, Enclose eyes and the surrounding areas, Accomodate wearers with prescription glasses, Clear plastic lens with fog and scratch resistant treatments, Adjustable band to secure firmly so as not to become loose during clinical activity, Indirect venting to avoid fogging, May be re-usable (provided appropriate arrangements for decontamination are in place) or disposable.	• EU standard directive 86/686/EEC, EN 166/2002, • ANSI/ISEA Z87.1-2010, or equivalent

		Apron	Apron, disposable or single use, made of polyester with PVC-coated, or other waterproof material, Straight apron with bib, minimum basis weight: 250g/m2, waterproof, Covering size: 70-90 cm (width) X 120-150cm (height), or standard adult size
		Alcohol-based hand rub	bottle of 100ml
		Bio-hazardous bag	Disposal bag for bio-hazardous waste, 30x50cm, with "Bio Hazard" print, autoclavable polypropylene. 50 or 70 micron thickness
		Body bag	Made of linear enforced, U-shape zipper and 2 zipper pulls with tie ribs. adult size 250x120cm Protector Body Bag specifications: • 6 handles • Impermeable, linear reinforced LLDPE, LDPE, EVA, PEVA, (avoid PVC), minimum thickness 400 microns; • Should be able to hold 100-125 kilos (200-250 lbs), • Should contain no chlorides: burning of chlorides pollute the environment and can cause damage to retort chambers. Body bags should be non carcinogenic to health of funeral workers when used for cremations. • At least 6 handles included in the body bag to allow burial team to hand carry it safely • Heat-sealed: insure superior strength and safety, • Provide full containment of blood borne pathogens • Cracking point of 25 - 32 degrees below zero • Shelf life: minimum 10 years • Bag and hands should be white color
	Health Logistics	Sprayer, hand-held	1,5 liters, acid resistant
		Sprayer, backpack	12 liters, acid resistant
		Chlorine	NaDCC, granules, 1kg, 65 to 70% + dossage spon