

VERSION: 06

YEAR: 2022






SAFETY MANUAL

Center of Infectiology Lao-Christophe Merieux (CILM)



Samsenthai Road, Kaoyot Village, Sisathanak District, Vientiant Lao PDR. Tel: +856 (0) 21 260 357

Document control information

Activities	Name	Position	Date	Signature
Author	Ms. Mixivang XAYAOVONG	Quality/Biosafety Officer	21/10/2022	
	Mr. Johnny KHAMMIXAY	Quality/Biosafety Assistant Lab Technician	21/10/2022	
Reviewer	Dr. Vatthanaphone LATTAPHASAVANG	Lab Manager	21/10/2022	
Validator	Dr. Phimpha PABORIBOUNE	Scientific Director	21/10/2022	
Approved by:	Dr. Sisavath SOUTTHANIRAXAY	Executive Director	21/10/2022	

History of modifications:

Version	Date	Comments
01	14/06/2016	<ul style="list-style-type: none"> Initial version
02	05/03/2018	<ul style="list-style-type: none"> Update the layout and contain of section VII
03	13/03/2019	<ul style="list-style-type: none"> Change manual's name Biosafety manual to be safety manual Update application date and contain of the manual Add safety policy in page 2 of 34. Add safety audit checklist as annex 14.
04	10/07/2019	<ul style="list-style-type: none"> Updated frequency of maintenance for spill kits and first aid kits, in the section "Biological emergency equipment".
05	20/02/2020	<ul style="list-style-type: none"> Updated template
06	23/09/2022	<ul style="list-style-type: none"> Updated all content to be complied with ISO15190:2020.

Copy needed and location

Amount	Location of copies				
	Copy N°1	Copy N°2	Copy N°3	Copy N°4	Copy N°5
0	NA	N/A	N/A	N/A	N/A

	SAFETY MANUAL		Page 2 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

TABLE OF CONTENTS

SCOPE OF APPLICATION	5
OBJECTIVES	5
DEFINITION	5
REFERENCE	5
ASSOCIATED DOCUMENT	5
RESPONSIBILITIES.....	6
1. biosafety Policies ມະໂຍບາຍຄວາມປອດໄພດ້ານຊີວະພາບ	7
2. Biosafety committee	9
3. GENERAL INFORMATION	9
3.1. Risk Group Classification:	9
3.2. Biosafety Level:	10
4. Designing for safety	11
4.1. Preliminary considerations	11
4.2. General design requirements	11
4.3. laboratory security	12
5. Safety program management:	14
5.1. general considerations.....	14
5.2. Management requirement	14
5.3. Management responsibilities	15
5.4. Management of staff health	15
5.5. Laboratory Safety Officer	17
5.6. Safety manual	18
5.7. Safety program audits and inspection	19
5.8. record keeping	20
5.9. Safety Training and orientation	20
6. hazard identification and risk assessment	22
6.1. Hazard identification.....	22
6.2. Job hazard assessment.....	23
6.3. Risk assessment	23
6.4. Risk reduction	24

	SAFETY MANUAL		Page 3 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

6.5.	Laboratory safety signs:	24
7.	biosafety and biosecurity hazards	24
7.1.	General	24
7.2.	Hazard group	25
7.3.	Containment levels.....	26
7.4.	Aerosols	26
7.5.	Decontamination.....	26
7.6.	stand Standard precautions, routine practices and additional precautions	26
7.7.	Biological safety cabinets	26
7.8.	Biological spills.....	27
8.	chemical hazards;	27
8.1.	General:	27
8.2.	Toxic chemical	27
8.3.	Corrosive materials	27
8.4.	Chemical Storage:.....	27
8.5.	Chemical Spill:	27
8.6.	Chemical Waste.....	28
9.	Physical hazards	28
9.1.	Ventilation and indoor air quality	28
9.2.	Electrical	28
9.3.	Temperature and humidity	28
9.4.	Noise	28
9.5.	Pressure.....	28
10.	emergency preparedness and response.....	29
10.1.	General	29
10.2.	First aid equipment and procedures	29
10.3.	Eyewash facilities	30
10.4.	Emergency shower.....	30
10.5.	Spill response.....	30
11.	fire safety.....	30
11.1.	Fire prevention and control	30
11.2.	emergency exits and Evacuation plan.....	31

 ສູນຄົ້ນຄວ້າພະຍາດອຸ້ມເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢ ມາຣິເອີ Center Infectiology Lao-Christophe Merieux	SAFETY MANUAL		Page 4 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

12.	laboratory ergonomics;	32
13.	equipment safety;.....	33
13.1.	Automated analysis equipment for sample examinations:	33
14.	Safe personnel work practices;.....	33
14.1.	Food, drink and like substances:.....	33
14.2.	Cosmetics, hair, jewellery	34
14.3.	smoking.....	34
14.4.	Personal property	34
14.5.	Festive decorations	35
14.6.	Hand hygiene:	35
14.7.	Mouth pipetting	35
14.8.	Sharps:.....	35
15.	personal protective equipment;.....	35
16.	Transport of samples and hazardous materials	37
17.	waste disposal;.....	37
18.	housekeeping practices;	37
19.	incidents, injury, accidents and, occupational illnesses;	38
20.	Documentation	38
21.	Annexes:	38

 <p>ສູນຄົ້ນຄວ້າພະຍາດອຸ້ມເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເອ ສວນມ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 5 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

SCOPE OF APPLICATION

This manual explains all safety program performing at CILM and it apply to all CILM staff and others that sharing CILM building.

OBJECTIVES

- To ensure all personnel within CILM building are safe.
- To ensure all samples and patient' information is safe.

DEFINITION

- Biohazard: A potential source of harm caused by biological agents or toxins
- Biorisk: Combination of the probability (likelihood) and severity (consequences) of harm from an adverse event involving biological agents
- Biosafety: Principles and practices that are implemented to prevent unintentional exposure to biological agents, or their accidental release
- Biosecurity: Principles and practices that are implemented to prevent loss, theft, missue or diversion of biological biorisk
- Safety: The condition of being protected from or unlikely to cause danger, risk, or injury.
- PPE: Personal Protective Equipment;
- BSC: Bio-Safety Cabinet;
- Waste: is everything discarded in the CILM center that is unrecyclable or to re-use;
- Risk: is a probability of damage, injury, contaminated, infection, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action;
- Emergency: Sudden, unexpected, or impending situation that may cause injury, loss of life;
- GCLP: Good Clinical Laboratory Practices;
- GMT: Good Microbiological Technique.
- GBP: Good Biosafety Practices
- Job hazard assessments:

REFERENCE

- *ISO15189:2012 – Medical Laboratories – Requirements for quality and competence;*
- *ISO15190:2020 – Medical Laboratories – Requirements for safety;*
- *WHO Laboratory Biosafety Manual, 4th Edition,2020;*

ASSOCIATED DOCUMENT

- *QMS-MAN001 – Quality Manual*
- *LRM-MAN004 – Newcomer's Manual*
- *LRM-HSP001 – General Maintenance and Cleaning*
- *SSM-SOP001 – Risk Assessment Procedure*
- *EMP-SOP001 – Waste Management Procedure*

RESPONSIBILITIES

Lab management	<ul style="list-style-type: none"> • Support safety activities • Remove roadblock of the implementation of safety management. • Primary responsibility for the safety of all employees and patients and/or laboratory visitors. The ultimate responsibility must rest with the laboratory director or a named person of equivalent standing.
Scientific director Lab manager	<ul style="list-style-type: none"> • Ensure all safety required resource are adequate and provided; • Ensure all at-risk workers have been informed of risk assessments and control measures, and/or provisions for any recommended precautionary medical practices; • Ensuring that processes are in place to routinely measure the effectiveness of the control measures, and to change the control measures as appropriate to improve biorisk management performance.
Lab manger	<ul style="list-style-type: none"> • Being as first aid provider.
Biosafety committee	<ul style="list-style-type: none"> • Validate all safety issues
Biosafety officer Biosafety assistant	<ul style="list-style-type: none"> • Establish, monitor and control safety programs. • Conduct safety audit and inspection • Maintain, update safety manual and policy, • Ensure all safety requirement, guidelines, practice are communicated to all staff. • Ensure biohazard risks are control, monitor, assess and improve. • Ensure all incidents are investigated, record, reports and reviewed. • Ensure lab cleaning, decontamination and biohazard waste are conduct complying safety policy and safety manual. • Ensure that ensure that specific and appropriate safety training programmes are implemented for all laboratory.
All staff	<ul style="list-style-type: none"> • Read the manual and understand • Report and record incident to the management and biosafety committee • Follow safety rule every time when working with biological substance and chemical.

(Table N° 01: Responsibilities)

 <p>ສູນວິໄຈພະຍາດອຸ້ມເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢ ສວລມ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 7 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
	Application date: 24/10/2022	Next revision date: 24/10/2024	

1. BIOSAFETY POLICIES ນະໂຍບາຍຄວາມປອດໄພດ້ານຊີວະພາບ

This policy is to described how CILM complied international regulation ISO15190:2020 and how is it performance. **Safety policy is the word that commit** to shows how CILM protect it hazard from the CILM staff, patients, visitors, etc. and environment.

ນະໂຍບາຍສະບັບນີ້ຂຽນເພື່ອອະທິບາຍວ່າ CILM ປະຕິບັດຕາມກົດລະບຽບສາກົນ ISO15190:2020 ແລະ ຈັດຕັ້ງປະຕິບັດແນວໃດ. ນະໂຍບາຍຄວາມປອດໄພ ແມ່ນຄໍາຫມັ້ນສັນຍາ ທີ່ ສະແດງໃຫ້ເຫັນວ່າ CILM ປ້ອງກັນອັນຕະລາຍຈາກ ພະນັກງານ, ຄົນເຈັບ, ແຂກ ຜູ້ມາໃຊ້ບໍລິການ, ແລະ ບຸກຄົນອື່ນໆທີ່ຢູ່ພາຍໃນຕົກດ້ວຍກັນ ແລະ ສິ່ງແວດລ້ອມ.

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Only authorized person can access to laboratory area and laboratory information. b. Performing sampling collection must wear properly and clean PPE, glove is changing for each patient; c. Sample transportation by safety transportation box; d. Spill kit, first aid kit, eye washers, shower must be available and inspection regularly; e. Only trained staff can perform work on biohazard and chemical areas; f. Activities that generate aerosol must be always performed in the Biosafety Cabinet (BSC); g. PPE must be removed before leaving the laboratory; h. Laboratory must be cleaned regularly; i. Equipment that must be taken out of the laboratory for maintenance or service must be decontamination before leaving the lab and before put back into the laboratory. j. Hand washing facility must be available on each area that containing biohazard and chemical; k. Biohazard waste must be autoclaved and treated as national guideline; l. All CILM staff must be trained on fire prevention, evacuation and how to use fire extinguisher. m. Extinguishers, smoke detection alarm system must be checked regularly; | <ul style="list-style-type: none"> a. ສະເພາະຜູ້ທີ່ໄດ້ຮັບອະນຸຍາດເທົ່ານັ້ນທີ່ສາມາດເຂົ້າເຖິງພື້ນທີ່ທ້ອງວິເຄາະ ແລະ ຂໍ້ມູນທ້ອງວິເຄາະ. b. ການປະຕິບັດການເກັບຕົວຢ່າງຕ້ອງໃສ່ PPE ຢ່າງຖືກຕ້ອງແລະ ສະອາດ, ປ່ຽນຖົງມືທຸກຄັ້ງ ເມື່ອປ່ຽນເຈັບ. c. ການຂົນສົ່ງຕົວຢ່າງໂດຍກ່ອງຂົນສົ່ງຕົວຢ່າງທີ່ຄວາມປອດໄພ d. ຕ້ອງມີ ຊຸດ SPILL KIT, ຊຸດປະຖົມພະຍາບານ, ຟັກປົວລ້າງຕາ, ຟັກປົວລ້າງໂຕ ແລະ ກວດກາເປັນປົກກະຕິ; e. ສະເພາະພະນັກງານທີ່ໄດ້ຮັບການຝຶກອົບຮົມເທົ່ານັ້ນທີ່ສາມາດປະຕິບັດວຽກ ທີ່ມີການສໍາພັດກັບ ອັນຕະລາຍທາງຊີວະພາບ (BIOHAZARD) ແລະ ສານເຄມີ ໄດ້; f. ກິດຈະກຳທີ່ຈະກໍ່ໃຫ້ເກີດ ລະອອງຝອຍ (aerosol) ຕ້ອງປະຕິບັດຢູ່ໃນ Biosafety Cabinet (BSC) ທຸກຄັ້ງ; g. ຕ້ອງແກ້ PPE ທັງໝົດ ແລະ ລ້າງມືທຸກຄັ້ງກ່ອນ ອອກຈາກທ້ອງວິເຄາະ; h. ທ້ອງວິເຄາະ ຕ້ອງໄດ້ຮັບການອະນາໄມເປັນປະຈຳ; i. ອຸປະກອນທີ່ຕ້ອງນໍາອອກຈາກທ້ອງວິເຄາະ ເພື່ອໄປ maintenance ຫຼື ຊ້ອມແປງ ທຸກຄັ້ງ ຕ້ອງຜ່ານການຂ້າເຊື້ອດ້ວຍເຫຼົ້າ 70% ແລະ ກ່ອນທີ່ຈະນໍາກັບຄືນເຂົ້າທ້ອງວິເຄາະ. j. ອ່າງລ້າງມື ຫຼື ເຫຼົ້າ 70% ຫຼື 90% ຕ້ອງມີຢູ່ໃນແຕ່ລະພື້ນທີ່ ທີ່ມີການປົນເປື້ອນຕົວຢ່າງ ຫຼື ສານອັນຕະລາຍທາງຊີວະພາບ ແລະ ສານເຄມີ; k. ຂີ້ເຫຍື້ອຕິດເຊື້ອທາງຊີວະພາບ ຕ້ອງຖືກໜັງ (autoclaved) ແລະ ປະຕິບັດເປັນຄໍາແນະນໍາແຫ່ງຊາດ; l. ພະນັກງານ CILM ທຸກຄົນ ຕ້ອງໄດ້ຮັບການຝຶກອົບຮົມກ່ຽວກັບການປ້ອງກັນອັກຄີໄພ, ການອົບພະຍົບໄປຍັງຈຸດລວມພື້ນ ແລະ ວິທີການນໍາໃຊ້ບັງດັບເພິງທີ່ຖືກຕ້ອງແລະປອດໄພ. m. ບັງດັບເພິງແຕ່ລະຈຸດ ຕ້ອງບໍ່ມີສິ່ງກົດຂວາງ ແລະ ລະບົບສັນຍານເຕືອນຄວັນໄພ ທັງສອງຢ່າງນີ້ຕ້ອງໄດ້ຮັບການກວດກາເປັນປະຈຳ; |
|--|---|

 <p>ສວນວິໄຈພະຍາດອຸ້ມເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເອ Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 8 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- | | |
|---|--|
| <p>n. Pressure and temperature in the laboratory must be controlled and monitor regularly;</p> <p>o. BSC must be calibrated at least annually;</p> <p>p. All CILM must have HBV and COVID-19 vaccinations;</p> <p>q. Safety signs must be available everywhere in the lab appropriately.</p> <p>r. Laboratory information system, both paper and electronic files, must have a system to ensure that they are not stolen or damaged by outsiders.</p> | <p>n. ຄວາມດັນແລະອຸນຫະພູມໃນຫ້ອງວິເຄາະຕ້ອງໄດ້ຮັບການຄວບຄຸມ ແລະຕິດຕາມຂັ້ນທຶກເປັນປະຈຳ;</p> <p>o. ຕູ້ BSC ຕ້ອງໄດ້ຮັບການສອບທຽບ (calibration) ຢ່າງໜ້ອຍປະຈຳປີ;</p> <p>p. ພະນັກງານ CILM ທຸກຄົນ ຢ່າງໜ້ອຍຕ້ອງມີວັກຊີນ HBV ແລະ COVID-19;</p> <p>q. ປ້າຍບັງບອກຄວາມປອດໄພ ຕ້ອງມີຢູ່ທົ່ວທຸກແຫ່ງທີ່ຈຳເປັນໃນຫ້ອງວິເຄາະຢ່າງເໝາະສົມ</p> <p>r. ຂໍ້ມູນຫ້ອງວິເຄາະ ທັງເປັນເຈ້ຍ ແລະ electronic ຕ້ອງມີລະບົບການຮັບປະກັນການຖືກລັກ ຫຼື ເສຍຫາຍ ຈາກບຸກຄົນພາຍນອກ.</p> |
|---|--|

Date: 21/10/2022

Approved by:

Dr. Sisavath SOUTTHANIRAXAY



Executive Director of CILM

2. BIOSAFETY COMMITTEE

The Biosafety Committee is assigned to validate all the safety and security issue. That include below positions:

1. Scientific Director or Lab Director
2. Lab Manager
3. Biosafety Officer
4. Biosafety Assistant
5. Fire Responsible / Maintenance Manager
6. Waste Responsible / Lab Technician

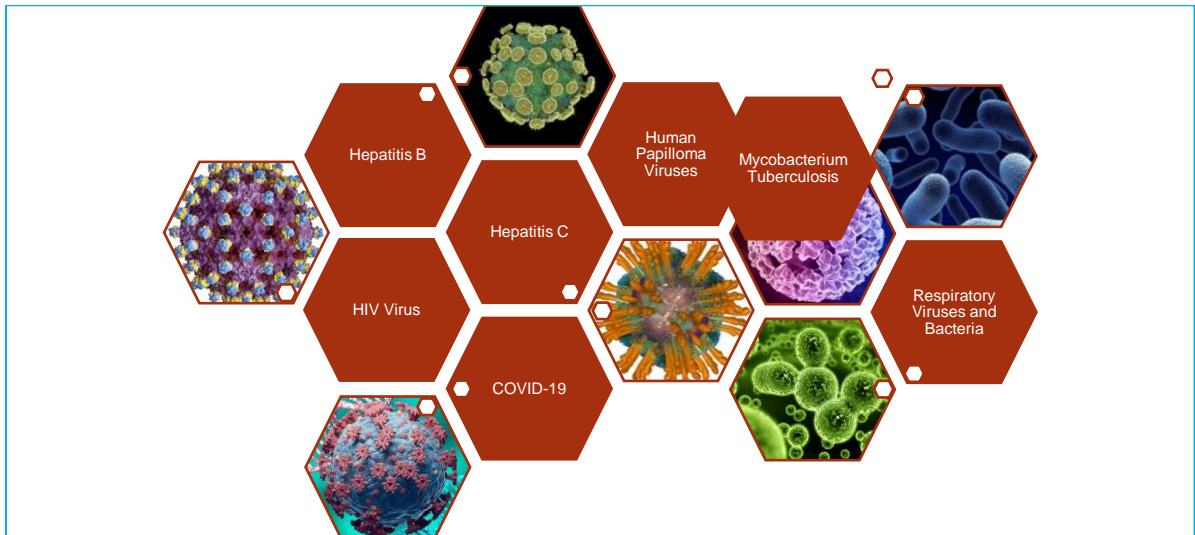
Referred to: [Safety Committee Assignment Letter #00000703/CILM](#)

3. GENERAL INFORMATION

3.1. RISK GROUP CLASSIFICATION:

3.1.1. PATHOGENS ARE HANDLED AT CILM'S LABORATORY:

- Hepatitis B and C Virus;
- HIV;
- Mycobacterium Tuberculosis;
- COVID-19
- Human Papilloma Virus;
- Respiratory Virus and Bacteria.



(Picture N° 01: pathogens handling in the laboratory)

3.1.2. RISK GROUP CLASSIFICATION

Risk Group 1 (no or low individual and community risk): A microorganism that is unlikely to cause human or animal disease.

Risk Group 2 (moderate individual risk, low community risk): A pathogen that can cause human or animal disease but is unlikely to be a serious hazard to laboratory personnel, the community, livestock or the environment. Laboratory exposures may cause serious infection, but effective treatment and preventive measures are available and the risk of spread of infection is limited.

Risk Group 3 (high individual risk, low community risk): A pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another. Effective treatment and preventive measures are available.

Risk Group 4 (high individual and community risk): A pathogen that usually causes serious human or animal disease and that can be readily transmitted from one individual to another, directly or indirectly. Effective treatment and preventive measures are not usually available. Source: WHO Laboratory Biosafety Manual, 3rd edition (2004)

3.2. BIOSAFETY LEVEL:

CILM laboratory is on BSL 2 and 3 (*Referred to: Laboratory biosafety manual – 3rd edition*).

Relation of risk group to biosafety levels, practices and equipment.

RISK GROUP	LABORATORY TYPE	BIOSAFETY LEVEL	LABORATORY PRACTICES	SAFETY EQUIPMENT
1	Basic Biosafety Level 1	– Basic teaching research	GMT	Non; open bench work
2	Basic Biosafety Level 2	– Primary health services, diagnostic services, research	GMT plus protective clothing, sign	Open bench plus BSC for potential aerosols
3	Containment Biosafety Level 3	– Special diagnostic services, research	As level 2 plus special clothing-controlled access, directional airflow	BSC and/or other primary devices for all activities
4	Maximum Containment Biosafety Level 4	– Dangerous pathogen units	As level 3 plus airlock entry, shower exit, special waste disposal	Class III BSC, or positive pressure suits in conjunction with Class II BSCs, double ended autoclave (through the wall), filtered air

(Table N° 02: Biosafety Level)

 <p>ສູນຄົ້ນຄວ້າພະຍາດອິນເຊັຍ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢ ສວລມ Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 11 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

4. DESIGNING FOR SAFETY

4.1. PRELIMINARY CONSIDERATIONS

When new construction is being considered, or where a laboratory is already established and structural changes are proposed, appropriate building codes containing specific architectural safety standards for the laboratory SHOULD be followed.

It is presupposed that national and local building regulations are taken into consideration. No structural or engineering work shall be undertaken without the appropriate authorization by the laboratory director or designate.

The design process should include the identification and consultation of the individuals involved in the planning, construction and operation of the facilities, including:

- a. Scientific personnel;
- b. CILM Safety Committee;
- c. Designers;
- d. Builders;
- e. Maintenance managers;

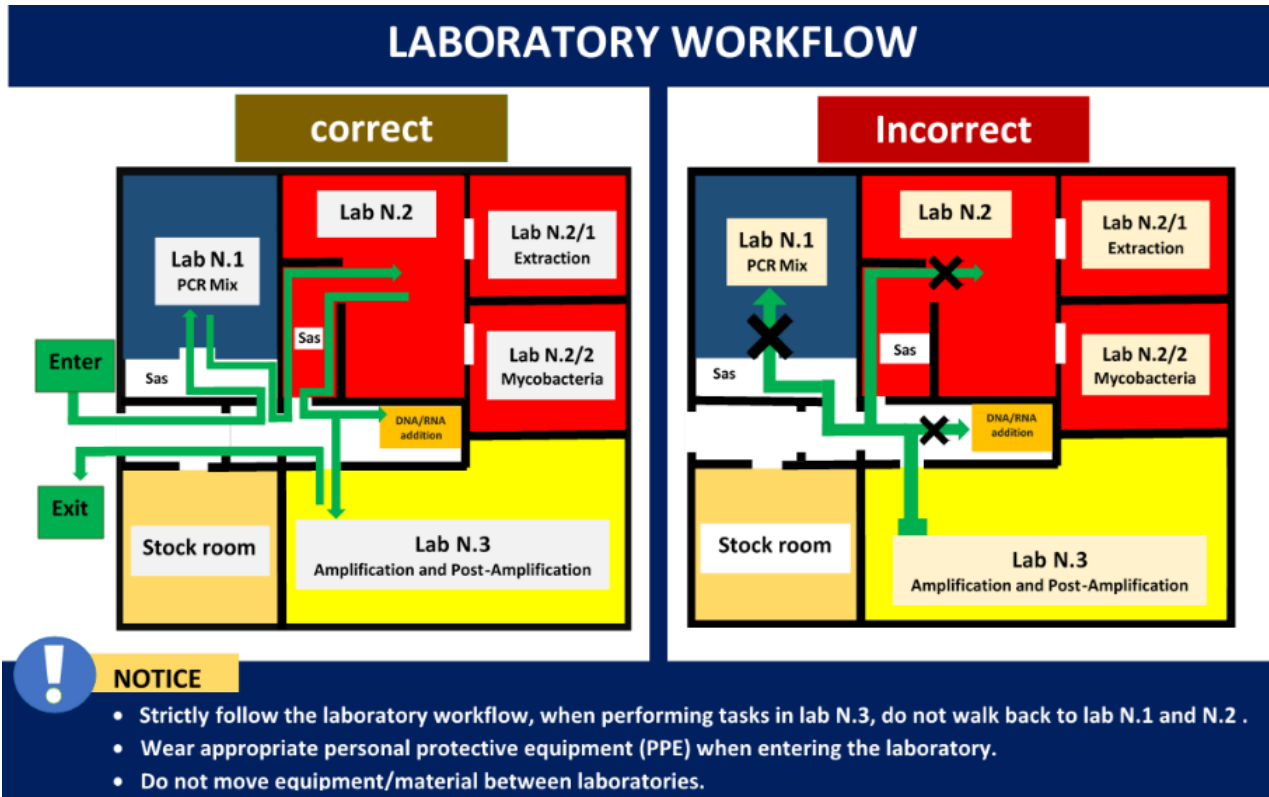
4.2. GENERAL DESIGN REQUIREMENTS

- a. Ensure the design facilitates the prevention of cross-contamination where examination procedures pose a hazard or where work could be affected or influenced by not being separated;
- b. Air-circulating system is effective separation between contaminated areas (individual air-circulating system).
- c. Complete separation (from floor to ceiling, including doors) of clean and contaminated work-spaces.
- d. Risk could be mitigated by hygiene measures such as hand washing or disinfection of inert surfaces especially in areas where clinical samples are handled.
- e. Environmental must be controls and facilities, furnishings, work surfaces and floor furnish must be appropriate to the activity being performed in the laboratory.
- f. Bench tops, chairs, flooring must be cleanable.
- g. Ensure that materials that have the potential to retain bio hazardous materials (e.g. Carpet) are avoided to minimize the risk to staff, patients or visitors.
- h. Corridors and passages to the exits MUST BE clear of obstructions.
- i. Sufficient unobstructed space for safe working, including adequate space around large pieces of equipment for maintenance personnel.
- j. Work place must be quiet and uninterrupted.
- k. Hand washing must be available on all areas where biological materials are handled and are placed near exits and hand-operated sink handles should be replaced with motion, elbow, knee or foot operated equipment wherever possible.
- l. Privacy of individual patients is protected

CILM building is separated as below area:

1. Sample reception room;
2. Sampling room;
3. Preparation room
4. Laboratory area where analytical is performed,
5. Bio-bank room;
6. Autoclave room;
7. BSL-3 container
8. Stock room;
9. Document archiving room;
10. Offices.

The properly workflow in the laboratory is prevent cross contamination showed in the below picture:



(Picture N° 02: CILM Laboratory workflow)

4.3. LABORATORY SECURITY

4.3.1. RISK ASSESSMENT:

 <p>ສູນຄົ້ນຄວ້າພະຍາດລູກເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຽ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 13 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

CILM conducts risk assessment annually by Biosafety Officer, Biosafety Assistant and Lab Manager. All risk findings must be count into account as SMART Plan.

Biosafety committee is the reviewer.

Referred to: [SSM-SOP001: Risk assessment.](#)

4.3.2. SECURITY PROGRAM:

Biohazard contaminated areas, storage of samples and laboratory information must be secured and only authorized can access.

- CILM entrance and laboratory areas (contaminated) are authorize access only.
- Laboratory samples storage are only authorized only lab personnel.
- Lab information areas are authorized only lab personnel and data manager.
- Chemical storages are authorized only inventory responsible and authorized staff only.

4.3.3. PHYSICAL SECURITY

- Laboratory entrances are lockable doors. These door locks are not prevented exit in an emergency.
- Laboratory access shall be restricted to authorized personnel.
- Additional security measures, such as lockable doors, locked freezers, limited access to specific personnel, etc., can be required when handling and storing highly hazardous samples, cultures, chemical reagents or supplies as indicated by the risk assessment.
- The threat of theft and tampering with biological agents, samples, chemicals and confidential information should be assessed, and appropriate steps taken to prevent these acts from happening.
- All personnel should be readily identifiable to guard from unauthorized access.
- Workers should be provided with ready access to telephones, panic buttons or other emergency alert devices.

4.3.4. INVENTORY

Biohazard, hazardous materials and chemical substance are controlled and maintained, access control, storage in safe place, and handling according to safety requirements.

4.3.5. INFORMATION MANAGEMENT AND SECURITY

Access to confidential information is being controlled in both electronic and paper base. Information management and security SOP is developed.

Referred to: [LIM-SOP001: Laboratory Information Management](#)

4.3.6. INCIDENT AND EMERGENCY RESPONSE

 <p>ສູນຄົ້ນຄວ້າພະຍາດລູກເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຽ ສວລມ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 14 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

Laboratory security considerations SHOULD be incorporated into incident and emergency response plans, investigation of incidents and implementation of corrective actions. The procedure for reporting incidents or suspicious activities should be established and disseminated.

5. SAFETY PROGRAM MANAGEMENT:

5.1. GENERAL CONSIDERATIONS

A comprehensive safety program must encompass all aspects of daily laboratory operations, including:

- a. Hazard identification and risk assessment;
- b. Biosafety and biosecurity hazards, to include blood-borne pathogens, respiratory protection;
- c. Chemical hazards;
- d. Physical hazards;
- e. Emergency preparedness and response;
- f. Fire safety;
- g. Laboratory ergonomics;
- h. Equipment safety;
- i. Personnel work practices;
- j. Personal protective equipment;
- k. Transport of samples and hazardous materials;
- l. Waste disposal;
- m. Housekeeping practices;
- n. Incidents, injury, accidents and, occupational illnesses;
- o. Safety education and training; and
- p. Record keeping.

5.2. MANAGEMENT REQUIREMENT

- a. **Visitors and contractors:** must follow CILM rules such as:
 - Entering laboratory must follow safety rules
 - Hepatitis and COVID-19 vaccinations are required for interns and CILM staff.
- b. **Staff health surveillance:** CILM staff health checks are conducted annually.
- c. **Risk assessment:** are conducted regularly and recorded and preventive action is defined.
- d. **Hazardous substance** movement must inform other related staff.
- e. **Safe practice handling hazardous materials:** (Referred to [SERV-MAN001-Service manual and PRE-SOP001 - Pre-examination SOP](#)).
- f. **procedures to prevent theft of high risk and contaminated materials:**
 - CILM has guardian for 24 hrs.,
 - Entrance to CILM is secured for authorized only,
 - Entrance to CILM office is secured for authorized only,
 - Entrance to laboratory is secured for authorized only;
 - CCTVs are around all placed that needs including inside of Bio-Bank Room;
 - Bio-Bank room is secured for authorized only;
- g. **Methods for identifying training needs and documentation:**
Referred to [PER-SOP003: Training Management Procedure](#);

	SAFETY MANUAL		Page 15 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- h. **MSDS:** folder is placed in Lab-3 near the chemical cabinet, to use the MSDS
Referred to: [SSM-MAN001-ANN01 - MSDS Master List](#);
- i. **Safe decontamination and maintenance of equipment:**
Referred to: [LRM-EQP030: Equipment management procedure](#)).
- j. **Spill** procedures: Referred to [SSM-MAN001-ANN05 and 06](#);
- k. **Incident** recording, reporting and investigation:
Referred to: [SSM-MAN001 – ANN01 and 12](#)
 - Incident must be record in Nonconformity form
 - All incident must be investigated for the root cause
 - Define measure to control the procedure to protect re-occurred.

5.3. MANAGEMENT RESPONSIBILITIES

Laboratory management is the primary responsibility for the safety of all employees and patients and/or laboratory visitors. The ultimate responsibility shall rest with the laboratory director or a named person of equivalent standing.

5.3.1. SCIENTIFIC DIRECTOR

Where applicable, an individual(s) with responsibility for medical laboratory management at the facility should also be designated with specific biorisk management responsibilities.

- a. Planning and coordinating work activities, and ensuring adequate staffing levels, time, space, and equipment are available;
- b. Ensuring (where necessary in consultation with the biorisk management advisor) that hazard identification and risk assessments have been performed, reviewed by affected workers, subjected to approvals required by the biorisk management system, and that the required control measures are in place;
- c. Ensuring required authorizations for work are in place;
- d. Ensuring that all at-risk workers have been informed of risk assessments and control measures, and/or provisions for any recommended precautionary medical practices;
- e. Ensuring that all work is conducted in accordance with established policies and guidelines described in this document;
- f. Supervising workers, including ensuring only competent and authorized workers have access and can work in areas under supervision; and
- g. Ensuring that processes are in place to routinely measure the effectiveness of the control measures, and to change the control measures as appropriate to improve biorisk management performance.

Referred to: [Scientific Director Job Description](#)

5.4. MANAGEMENT OF STAFF HEALTH

5.4.1. GENERAL

 <p>ສູນວິໄຈພະຍາດອຸ້ມເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢ ມາຣິເອ ສວລມ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 16 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

All CILM personnel should have documented evidence of training related to potential risks associated with working with any medical (clinical) laboratory facility.

5.4.2. IMMUNIZATION

Hepatitis B vaccine is required to all CILM personnel and other interns. Immunization records must be maintained. Referred to: Staff personnel file (at admin department).

COVID-19 vaccination is also required based on National Regulation.

5.4.3. PSYCHOLOGICAL HAZARDS;

5.4.3.1. GENERAL

Laboratory management is responsibility and actions to reduce organizational, environmental and personal factors that contribute to excessive stress.

5.4.3.2. ORGANIZATIONAL FACTORS

Laboratory management is taken responsibility and actions to reduce these factors includes:

- a. Workload assessment must be conducted at least once a year.
- b. Task and schedule re-design;
- c. Training program is implemented. Referred to SOP: [PER-SOP003: Training management procedure](#)
- d. CILM staff health checks are conducted once a year and records are maintained.

5.4.3.3. ENVIRONMENTAL STRESSORS

Approaches to manage environmental stressors is include:

- a. Lab meeting must be conducted regularly and record the minute of meeting.
- a. Procedures to address complaints and purchasing controls referred to SOP: [COMP-SOP001: Complaint Handling](#) and SOP: [LRM-PSP001 - Purchasing Management Procedure](#).

Actions to address personal stress management can include:

- a. Self-renewal activities referred to SOP: [PER-SOP003: Training Management Procedure](#)
- b. Improved health practices;
- c. Counselling;
- d. Communication opportunities; and
- e. Physician prescribed treatment.

5.4.3.4. EMPLOYEE IMPAIRMENT

- a. New staff must be conducted evaluation to ensure he/she is fulfilled job description after 3 months of probation period.
- b. Old lab technician must be conducted competency assessment at least once a year.

 <p>ສູນວິໄຈພະຍາດອຸປະສັກ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຽ Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 17 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

Referred to SOP: [PER-SOP002: Competency assessment procedure](#)

5.5. LABORATORY SAFETY OFFICER

An appropriately qualified and experienced laboratory safety officer shall be designated to assist the laboratory management with safety issues and directly report to the laboratory management.

This person must ensure the development, maintenance and monitoring of an effective laboratory safety programme that addresses all safety aspects of the laboratory's activities, including biological, chemical, physical, occupational, and radiological safety as applicable. An effective laboratory safety programme should include risk assessment and mitigation, education, orientation and training, audit and evaluation, and programmes to promote safe laboratory practice.

Responsibilities of the laboratory safety officer should include but are not limited to:

- a. Provide advice and guidance on the establishment and implementation of the laboratory safety policy and an up-to-date safety manual;
- b. Provide and maintain a current safety manual;
- c. Ensure applicable safety-related requirements, guidelines and practices are communicated to all staff involved in the laboratory work flow and operations and provide clarifications as needed;
- d. Advise on risk management issues within the organization (e.g. Laboratory management, biorisk management committee, occupational health department, security) and ensure that relevant and up-to-date information on risk management is made available to laboratory staff and management;
- e. Identify, assess, prioritize and document safety risks and hazards that exist as well as those that could arise within the laboratory or result from its activities and regularly review this documentation and make updates as needed;
- f. Develop risk reduction strategies and specify practices and procedures that will reduce safety risks and hazards to an acceptable level (or eliminate them) and verify, in conjunction with stakeholders, that all relevant safety risk considerations are addressed;
- g. Assist laboratory staff in developing standard operating procedures (sops) that incorporate safe practices;
- h. Ensure documentation of all safety related materials (e.g. Sds) and authorizations needed for specific work activities;
- i. Provide guidance on the selection and provision of appropriate personal protective equipment based on the risk assessment for each activity within the laboratory;
- j. Monitor the implementation of the laboratory safety requirements, practices, procedures, and programs, including conducting regular safety audits and inspections, and evaluating risk management performance;
- k. Advise and assist laboratory management in ensuring that all activities are performed in conformance with applicable safety standards;
- l. Conduct regular review of laboratory facilities, engineering controls, operation and maintenance practices (including housekeeping) to identify changes in practices, procedures and technology that can present new risks;
- m. Respond to safety risk alerts and work with the laboratory management to stop activities that are unsafe or pose immediate health risks to laboratory and/or non-laboratory personnel;

	SAFETY MANUAL		Page 18 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- n. Advise or participate in the reporting, investigation, follow-up, and documentation of accidents, incidents, near-misses;
- o. Ensure review of all incident reports, including remedial actions, by the laboratory director and other responsible personnel;
- p. Assist in responding to any regulatory actions or investigations;
- q. Oversee routine decontamination procedures and decontamination procedures after an accident and provide guidance on when work can resume after decontamination;
- r. Ensure the establishment of a waste management plan which considers applicable requirements and guidelines;
- s. Contribute to the development and delivery of laboratory safety training/education activities and Evaluate their effectiveness and identify needs for new and refresher trainings;
- t. Participate or assist in the assessment of ergonomic needs for laboratory staff and communicate them to the laboratory management;
- u. Actively participate in organizational safety improvement activities such as laboratory safety or biosafety committee(s);
- v. Serve as, at least, an ex officio member if not its chair-holder, on the laboratory's safety committee;
- w. Collaborate or serve as liaison with other personnel with safety-related responsibilities, such as radiation safety officer, biorisk management advisor, and emergency response services; and
- x. Ensure awareness of applicable statutory and regulatory requirements for a laboratory safety program.

5.6. SAFETY MANUAL

The safety manual must be readily available in work areas as required reading for all employees.

- a. Safety policy;
- b. Fire prevention;
- c. Electrical safety;
- d. Chemical safety;
- e. Radiation;
- f. Biological hazards; and
- g. Hazardous waste disposal.
- h. Safety data sheets (sds).

Safety manual must be reviewed and updated at least annually by laboratory management / safety committee.

5.7. SAFETY PROGRAM AUDITS AND INSPECTION

The safety programme should be audited and reviewed at least annually (by appropriately trained personnel) including, but not limited to, the following elements:

Requirements	Actions	Indicators
a. Safety and health policy	<ul style="list-style-type: none"> Update safety policy in the safety manual 	Last version of safety manual
b. Written work procedures that include safe work practices;	<ul style="list-style-type: none"> Update Risk assessment SOP Update other indexes or annexes related to safety management. 	Update current version of sops and safety document related.
c. Education and training of laboratory-associated staff;	<ul style="list-style-type: none"> Refresh safety manual training 	Training records.
d. Supervision of workers;	<ul style="list-style-type: none"> Emergency equipment maintenance records Competency assessment 	Eye washer, showers, spill kit and first aid kit maintenance records.
e. Regular inspections;	<ul style="list-style-type: none"> Go around the CILM room by room to see if everything is in safe condition 	Safety inspection record
f. Hazardous materials and substances;	<ul style="list-style-type: none"> Any samples that moved, have to inform other related staff. 	Records.
g. Health surveillance and prophylaxis;	<ul style="list-style-type: none"> Health checks including status of vaccination 	Staff health checks records.
h. First aid services and equipment	<ul style="list-style-type: none"> Check first aid kit materials + refresh training; 	First aid kit maintenance records (same topic D)
i. Investigation of accidents and illnesses;	<ul style="list-style-type: none"> Summary the trend of all incident records 	<ul style="list-style-type: none"> Trends of incidents SMART Action plan.
j. Health and safety committee review	<ul style="list-style-type: none"> Review all safety issue and find the preventive action 	
k. Records and statistics; and	<ul style="list-style-type: none"> Analyses the trend of incidents, find preventive action 	
l. Requirement for follow-up to ensure that all required actions arising from the audit are completed	<ul style="list-style-type: none"> Check the status of implementing action plan from the last safety audit. 	Completed action plan.

Laboratory management should be responsible for ensuring that safety inspections are undertaken.

Work sites shall be surveyed/ inspected at least annually. This is to ensure:

- a. The proper state of readiness and function of fire emergency apparatus, alarms and evacuation procedures;
- b. The status of procedures and materials for hazardous spillage containment, including emergency showers and eyewash facilities;

 <p>ສູນວິໄຈພະຍາດອຸ້ມເຊີ້ນ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຽ ສວລມ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 20 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- c. The proper containment and control for the storage of flammable and combustible, infective, radioactive, toxic materials; and
- d. The status of decontamination and disposal procedures.

NOTE 2 Records of safety audits and examination of trends of incidents can provide information for taking appropriate remedial actions.

(Table N°03: SAFETY PROGRAM AUDITS AND INSPECTION)

5.8. RECORD KEEPING

- Training records, monitoring records, assessment records must be storage in the easy accessibility area for all CILM personnel.
- Incident report and record, immunization records must be storage as private information on each personnel profile folder.

Referred to: [REC-SOP001: Control of record](#)

5.9. SAFETY TRAINING AND ORIENTATION

5.9.1. SCOPE OF PERSONNEL SAFETY TRAINING

Biosafety Officer must ensure that all laboratory personnel below are have been trained on safety management including:

- a. Technical and administrative;
- b. Transport;
- c. Maintenance;
- d. Housekeeping/cleaning;
- e. Students;
- f. Contract staff; and
- g. Volunteers.
- h. New employees

NOTE: In addition to safety training, laboratory management must ensure that all new employees are oriented/ trained in the laboratory's general and role specific safety requirements, regardless of how much experience they can have from their previous employment.

5.9.2. SAFETY TRAINING PROGRAMME

A comprehensive safety training programme shall:

- a. Include an introduction for new employees; see [PER-SOP003-ANN02: Induction checklist](#)
- b. Require periodic retraining for experienced employees; See: [PER-SOP003: Training management procedure.](#)
- c. Be job or task specific and tailored according to the employee's job description;

	SAFETY MANUAL		Page 21 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- d. Include appropriate considerations for conditions such as pregnancy, immunodeficiency and physical disability;
- a. Address at a minimum, fire prevention and preparedness, chemical and radiation safety, biological hazards, infection prevention, occupational health and safety (e.g vaccines) first aid and environmental protection;
- b. Be routinely updated; and
- c. Undergo ongoing monitoring/assessment of risks to assess the training/re-training needs.

Note:

Personnel training records should be retained in an accessible file for a period of time and include dates of safety orientation and annual updates of safety training for each employee.

Employees are be required to read the appropriate safety manual before beginning to work in an area.

Confirmation in writing should be obtained from the staff member that they have received appropriate training and that safety manuals have been read and understood, including the dates when these were carried out. The laboratory's accident/incident reports should also be considered as a source for determining the areas in which additional training is required. personnel who share the building

5.9.3. FIRE PREVENTION AND CONTROL TRAINING

Instruction and training shall be given to all laboratory workers and personnel who share the building.

- a. Recognition and evaluation of fire hazards;
- b. Planning to reduce the risk of fire; and
- c. All actions to take when fires occur.

5.9.4. FIRST AID TRAINING

The Laboratory Director and Manager must ensure that:

- a. Lab Director and Manager are assigned as first aid provider;
- b. Materials and procedures are provided to mitigate adverse effects and incidents occurring to people within the laboratory involving chemical, toxic or potentially infectious materials; and
- c. Laboratory personnel have ready access to first aid materials/kits at all times.

First aid and emergency job aid are available on each laboratory room, easily accessible include: needlestick injuries or exposure to infectious agents via other mechanisms. (Referred: [Annex 01-15](#))

6. HAZARD IDENTIFICATION AND RISK ASSESSMENT

6.1. HAZARD IDENTIFICATION

All hazard is identified as bellows:

Biohazard symbol



(Picture N° 03: Biohazard symbol)

Chemical hazard symbols:



Acute Toxic



Health Hazard



Flammable



Exclamation Mark



Flame over circle



Gas Cylinder



Exploding Bomb



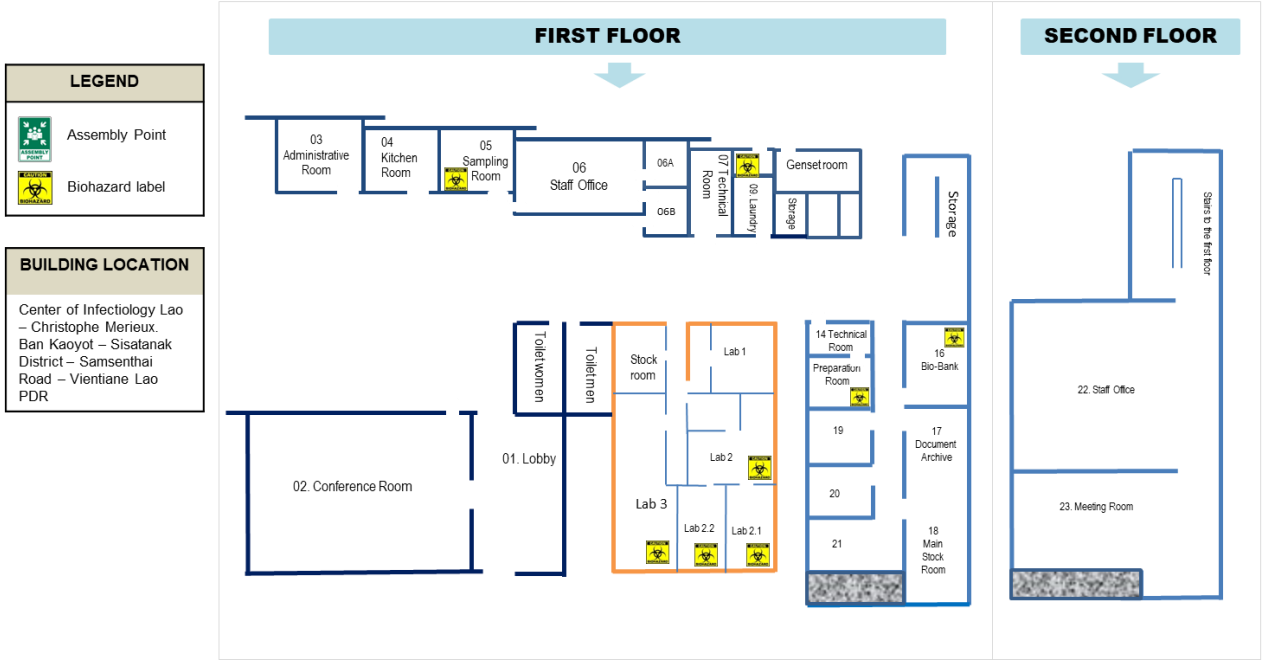
Environmental
Hazard



Corrosion

(Picture N° 04: Chemical hazard symbols)

Location of biohazardous samples



(Picture N° 05: Biohazard / contamination area)

6.2. JOB HAZARD ASSESSMENT

Job hazard is included in the risk assessment process referred to: [SSM-SOP001: Risk assessment procedure](#).

Biosafety officer/assistant, Safety committee are the key responsible for the process.

6.3. RISK ASSESSMENT

Safety committee must ensure that:

- a. That there is a formalized system of risk assessment;
- b. That suitable methodologies for assessing and prioritizing risks are identified, implemented, maintained and documented;
- c. That risk assessments encompass a base-line safety assessment and take into account activity- or protocol-specific information, and should be based on the unique context of those activities and protocols;
- d. That risk assessment identifies all potential scenarios of a particular activity that could produce a negative outcome;
- e. That risks are prioritized based on an evaluation of the likelihood and consequences of each of the risks;
- f. That the risk assessment determines the most appropriate control measures and how the system will measure the effectiveness of those control measures; and

	SAFETY MANUAL		Page 24 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- g. That approaches to risk assessment are defined with respect to scope, natures, and timing in order to be proactive rather than reactive.

Referred to: [SSM-SOP001: Risk assessment](#)

6.4. RISK REDUCTION

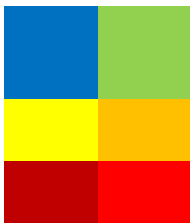

The risk from each safety hazard shall be reduced to as low a level as practicable and as acceptable, using the following order of priority

- a. By elimination;
- b. By substitution; or
- c. By containment; or
- d. By safe instruction and training; or
- e. By the use of personal protective measures and equipment

Referred to: [SSM-SOP001: Risk assessment](#)

6.5. LABORATORY SAFETY SIGNS:

The color table below indicate the color of safety signs in the laboratory:

	<p>BLUE or GREEN: means instruction, safety and security; <i>Note: Some instruction of emergency or facilities are red color because it is very important and want people to focus or easier to find.</i></p>
	<p>YELLOW or ORANGE: means warnings;</p> <p>RED: means dangerous, forbidden and fire activities are mentioned.</p>

(Picture N° 05: Sing identification colors)

- Safety signs are placed all the biohazard contaminated area
- Lab staff(s) are trained on good laboratory practice (GLP).
- Biohazard contaminated areas must be cleaned regularly.
- Telecom is ready for use in each laboratory room.

7. BIOSAFETY AND BIOSECURITY HAZARDS

7.1. GENERAL

7.1.1. WORK PRACTICES

The policies, processes and procedures (SOP) for handling, examination and disposal of material of biological origin should utilize good microbiology practice standards.

Work practices should be such as to reduce the risk of contamination. Work practices in contaminated areas should be implemented such as to prevent personal and environmental exposure.

	SAFETY MANUAL		Page 25 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

7.1.2. ENGINEERING CONTROLS

To provide the highest level of hazard control, the laboratory must implement engineering and administrative controls. Examples of engineering controls include but are not limited to:

- a. Laboratory design; must be complied with the safety level of the pathogen performing in the laboratory.
- b. Ventilation and air conditioning systems: are implemented;
- c. Use of biological safety cabinets (bsc) and aerosol reducing equipment;
- d. Self-sheathing needles or re-cap with one hand;
- e. Safety-engineered medical sharps;
- f. Plastic blood collection tubes;
- g. Sharps disposal containers;
- h. Engineered transport containers; and
- i. Aerosol barrier pipette tips.
- j. Humidity is record regularly.

7.1.3. ADMINISTRATIVE CONTROLS

Administrative and elimination controls include rules, processes, safe work procedures, training and other processors that should be put into place by laboratory management and followed or implemented by laboratory staff. Examples include, but are not limited to:

- a. Elimination or substitution of a biological hazard for one that poses lower risk;
- b. Immunization programs;
- c. Accurate hazard assessments;
- d. Designation of containment levels;
- e. Procedures that reduce exposure;
- f. Laboratory signage with hazards identified with symbols or pictograms;
- g. Decontamination methods (e.g. Autoclaves, incinerators);
- h. Employee training;
- i. Decontamination and spill response procedures;
- j. Attention to personal hygiene and housekeeping; and
- k. Post-exposure protocols.

7.1.4. BIOSAFETY POLICY

Biosafety policy is being maintained.

Referred to: [SSM-MAN001: Safety Manual / topic 1. BIOSAFETY POLICIES](#) ນະໂຍບາຍຄວາມປອດໄພດ້ານຊີວະພາບ

7.2. HAZARD GROUP

Hazard group is referred to: [SSM-MAN001: Safety Manual / topic 3.1. RISK GROUP CLASSIFICATION.](#)

 <p>ສູນວິໄຈພະຍາດອຸ້ມເຊື້ອ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຊ ສວລມ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 26 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

7.3. CONTAINMENT LEVELS

Containment level is referred to: [SSM-MAN001: Safety Manual / topic 3.2. BIOSAFETY LEVEL.](#)

7.4. AEROSOLS

Laboratory work practices must be designed and undertaken in such a way as to reduce the possibility of personal contact with harmful aerosols, whether of chemical or biological origin including:

- a. Samples should be centrifuged only in safety-capped enclosures.
- b. All samples being vortex-agitated shall be contained in containers with lids.
- c. Procedures which can generate infectious aerosols shall be performed in a biological safety cabinet.
- d. Local ventilation devices shall be used to capture toxic emissions at the source using a laboratory fume hood or cabinet to transfer and work with organic solvents.
- e. The use of localized air containment for large pieces of analytical equipment that could generate aerosols, and the use of custom-built extraction hoods to handle small apparatus manipulation is strongly recommended.
- f. Localized air extraction is essential where harmful chemical fumes can be present.

7.5. DECONTAMINATION

Decontamination and cleaning in the laboratory must be performed by trained personnel only.

Decontamination process is referred to [DEC-SOP001: Decontamination procedure.](#)

7.6. STAND STANDARD PRECAUTIONS, ROUTINE PRACTICES AND ADDITIONAL PRECAUTIONS

Lab personnel must be trained on standard safe practice, for performing with patient and patient's samples including airborne, that including:

- a. Hand hygiene;
- b. Personal protective equipment;
- c. Environment control;
- d. Administrative control;

All samples and biohazard waste must be treated as infectious waste. Referred to: [ENV-SOP001: Waste management](#)

7.7. BIOLOGICAL SAFETY CABINETS

Biosafety Cabinet (BSC): must be used when performing aerosol activities, by trained staff and must be calibrated annually referred to: [LRM-EQP020 - Use and maintenance BSC LA2-4A1](#)

	SAFETY MANUAL		Page 27 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

7.8. BIOLOGICAL SPILLS

Spill kit and job aid must be ready and accessible for all lab personnel in the work places referred to: [SSM-MAN001-ANN05: Spill kit job aid](#)

8. CHEMICAL HAZARDS;

8.1. GENERAL:

- Chemical should be clear labelling on each container;
- staff are trained on chemical spills and how to use SDS;
- **Safety Data Sheets (SDS)** is available near by the chemical performance area;
- PPE is available;
- Chemical must be performed in chemical hood as appropriate way;
- Emergency shower and eye washer are available in the lab that performs chemical, and has been maintenance regularly.

8.2. TOXIC CHEMICAL

Ethidium Bromine, location that performing and waste are only allowed to authorized staff ONLY.

8.3. CORROSIVE MATERIALS

Sodium Hypochlorite / liquid bleach) must be diluted in 10% for use, gloves and eye protection must be worn. Irrigating skin and eyes thoroughly for 15 min in the event of contact. And separating stored acids from bases.

8.4. CHEMICAL STORAGE:

- There are 3 Chemical cabinets such as: Flammable chemical, Acid chemical and base chemical cabinet.
- Powder must be in the first shelves and liquid must storage in the lowest shelves.
- The cabinet must be locked all the time and authorized access ONLY.
- Chemical must be stored according to it recommendation temperature (avoid heat, sun light and highly variable temperatures).
- Inventory up-to-date must be maintained;
- Used, surplus, out-of-date or otherwise unwanted materials must be disposed of on a regular basis.

8.5. CHEMICAL SPILL:

- Assess the situation determine the appropriate action;
- Post warning sign;
- Inform other staff (nearby that location);
- DO NOT TURN OFF the fume hood;
- Use SPILL KIT;
- If necessary, use EYE WASH and Emergency Shower nearby that location.

 <p>ສູນວິໄຈພະຍາດອຸ້ມເຊີນ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຽ CILM Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 28 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

8.6. CHEMICAL WASTE

Chemical waste is referred to: [EMP-SOP001: Waste management](#)

9. PHYSICAL HAZARDS

9.1. VENTILATION AND INDOOR AIR QUALITY

Chemical must be always performed in the fume hood by trained staff only.

BSC Class II type A2 are used at CILM.

9.2. ELECTRICAL

- Electrically equipment selected are basic considered on safety requirements
- Critical equipment must connect to uninterruptible power supply (UPS);
- only trained and competence person authorized to use, maintenance, decontaminate and repaired the equipment;
- The use of extension cords and multiple adaptors is avoided;
- Unauthorized work is forbidden.

9.2.1. ELECTRICAL SAFETY

For electrical safety, cords, plugs and connections must be regularly inspected for deterioration or corrosion.

All plugs must NOT be installed near by the hand washing sinks, and must higher from the floor 18 cm.



(Picture N° 06: Electrical Symbol)

9.3. TEMPERATURE AND HUMIDITY

- Temperature is control, monitored and record regularly;
- Humidity monitored and record regularly;
- Laboratory humidity is safety and comfort for laboratory workers.
- The room that contain equipment generating excessive heat, the temperature must be controlled.

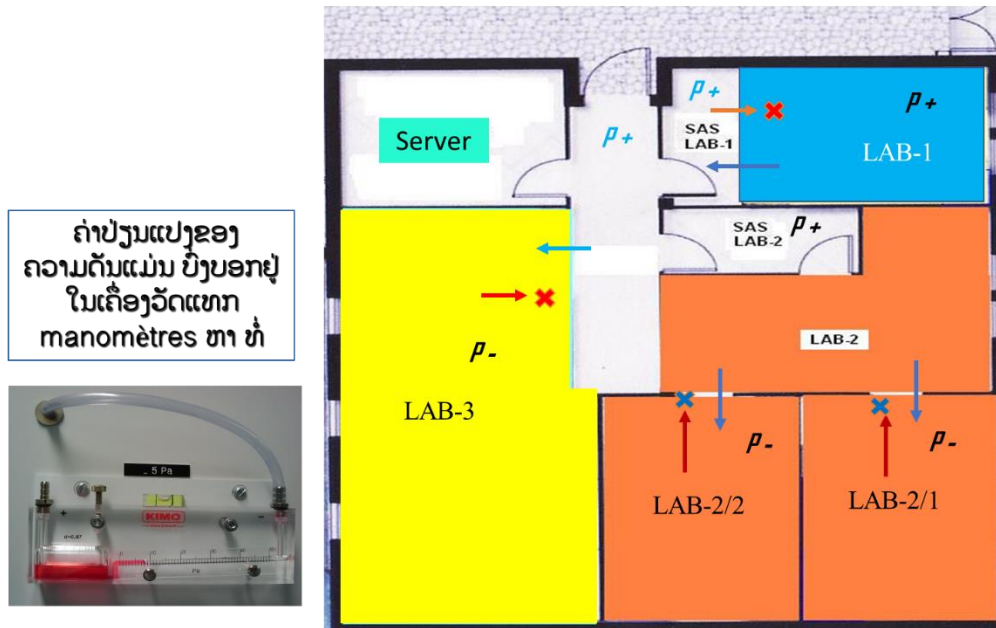
9.4. NOISE

- No equipment generate noise in the laboratory.
- Telephone is available on each lab room.

9.5. PRESSURE

There is difference pressure in the CILM laboratory according to the picture below:

- Clean air must be NEGATIVE pressure;
- Contaminated air must be Positive pressure.



(Picture N°07: CILM Laboratory pressure system)

10. EMERGENCY PREPAREDNESS AND RESPONSE

10.1. GENERAL

The laboratory implements:

- a. Emergency response plans in place to mitigate any potential emergency;
- b. Ensure all staff are well versed in the plans;
- c. Conduct practice drills periodically;
- d. Make emergency response equipment available in accordance with standard operating
- e. Procedures; and
- f. Post the emergency plan in conspicuous locations throughout the laboratory.

Referred to: Annex 16: [SSM-MAN001-ANN16 - Contingency plan](#)

10.2. FIRST AID EQUIPMENT AND PROCEDURES

- First aid box includes: sterile dressings set;
- Located in each lab room, clear labelled.
- First aid provider is Lab manager.

	SAFETY MANUAL		Page 30 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

10.3. EYEWASH FACILITIES

Eye washing stations are available on each lab room, maintenance regularly and recorded.

Portable eyewash bottles are usually designed to use on one eye and do not deliver the quantity of flushing solution required and do not stay open permitting continuous flushing. These units shall be well maintained to prevent contamination.

Referred to: Annex 11: [SSM-MAN001-ANN11 - Normal Saline solution for eye wash instruction of use](#)

10.4. EMERGENCY SHOWER

Emergency shower is available on Lab-3, most performing chemical area. Maintenance regularly and records are maintained.

Referred to: Annex 08: [SSM-MAN001-ANN08 - Emergency shower job aid](#)

10.5. SPILL RESPONSE

All spills of samples, chemicals or cultures should be cleaned up by trained personnel and the area decontaminated after risk assessment.

Referred to annex bellows:

- [SSM-MAN001-ANN05 - Spill kit job aid](#)
- [SSM-MAN001-ANN13 - Spill inside the BSC job aid](#)
- [SSM-MAN001-ANN06 - Spill kit maintenance form](#)

11. FIRE SAFETY

11.1. FIRE PREVENTION AND CONTROL

11.1.1. CONSTRUCTION

- Fire exist signs are posted on each door and office rout
- Assembly point are 2-5 minutes to get out from the laboratory to the assembly point.

11.1.2. FLAMMABLE MATERIAL STORAGE

- Flammable chemical is storage in a limited amount in the laboratory.
- Safety handling of flammable chemical is implemented

11.1.3. ALARM SYSTEM

- Smoke alarm system is set up, inspection and maintenance regularly.
- Fire leader is appointed "Maintenance Manager and Safety Biosafety Officer"
- Audible from dark area / test the voice, record the functioning testing.

	SAFETY MANUAL		Page 31 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- Staff are trained how to use alarm system regularly.
- Public fire department assistant urgent phone number is available on each telecom in the laboratory.

11.1.4. FIRE RISK REDUCTION STRATEGIES

- Only minimum quantity of ethanol in each laboratory
- Spill kit is on each lab room.

11.1.5. FIRE PREVENTION AND TRAINING PROGRAM

11.1.5.1. TRAINING PROGRAM

- New staff must be trained on fire safety.
- Fire training must be refreshed in every 2-3 years that include: fire factors and how to act when fire occurred.

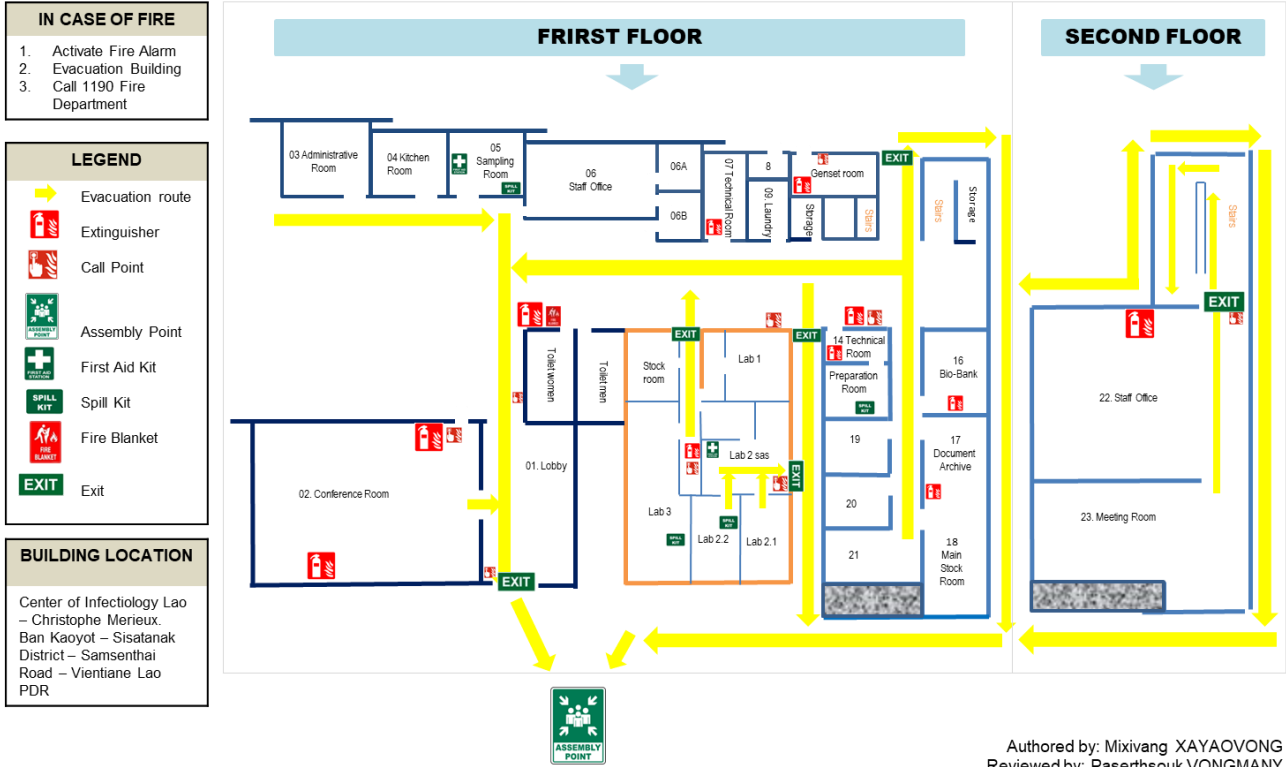
11.1.6. FIRE FIGHTING EQUIPMENT

- Fire extinguishers are properly installed and maintenance regularly.
- Fire blanket is available at the exit route (toilet area)

11.2. EMERGENCY EXITS AND EVACUATION PLAN

- Evacuation map is posted on at regular intervals throughout the building and trained all staff.
- Patient and visitors can easily visible

CILM EVACUATION MAP



(Picture N°08: CILM fire evacuation plan)

12. LABORATORY ERGONOMICS;

Laboratory activity, workspace and equipment workstations, computer keyboards and displays), as well as vibration-producing and ultrasonic equipment, etc., should be designed or positioned to reduce the risks of ergonomic distress disorders and accidents.

Employers should be responsible for:

- a. Performing a task analysis to review how work is done and what motions are required and to evaluate problems associated with awkward or repetitive motions;
- b. Including ergonomic considerations in purchasing requirements or standards;
- c. Considering the various types of workers who will be working at a workstation for proper workstation design;
- d. Considering the use of adjustable equipment, benches, and work stations to facilitate flexibility to various body types; and
- e. Training workers, particularly in proper body mechanics to ensure good ergonomics in the laboratory.

	SAFETY MANUAL		Page 33 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

NOTE Common ergonomic challenges in the laboratory include, but are not limited to:

- a. Frequent pipet ting;
- b. Use of optical microscopes for prolonged periods;
- c. Computer workstations;
- d. Biological safety cabinets (BSC); and

13. EQUIPMENT SAFETY;

Lab staff are trained and competence to use all lab equipment according to it SOP, their job description and authorization matrix mentioned including: centrifuges, mixers, pipettes, BSC, automate analysis equipment for sample examinations.

- **Centrifuge** must be balanced, open the lid when it stops rotating, tubes must be properly closed.
- **Biosafety Cabinet (BSC):** must be used when performing aerosol activities, by trained staff and the BSC must be calibrated annually.
- **Fume hood:** must be used for all performing of chemical by trained staff and maintenance regularly.
- **Mixers:** must be closed and all the time when using.
- **Pipettes:** must be used when performing chemical and biological agents.

13.1. AUTOMATED ANALYSIS EQUIPMENT FOR SAMPLE EXAMINATIONS:

The following should be taken as precautionary measures applicable to automated analysis equipment:

- a. Ensuring all reagents are stored according to requirements;
- b. Checking that all tubing and connections are in place prior to operating equipment;
- c. Using clear plastic safety shields in front of sample probes;
- d. Ensuring that only authorized and knowledgeable workers service equipment when it malfunctions;
- e. Reviewing local regulations for all waste line discharges and receptacles;
- f. Using closed sampling instruments whenever possible;
- g. Keeping drip trays clean;
- h. Avoiding overfilling sample cups; and
- i. Transferring required aliquots using a pipettor.

14. SAFE PERSONNEL WORK PRACTICES;

All the safety rules below must be followed all the time in the laboratory:

14.1. FOOD, DRINK AND LIKE SUBSTANCES:

- **Not allowed** in laboratory areas.
- Stored only in specifically designated refrigerators located in non-laboratory areas;
- Lab equipment must be labelled as biohazard and their intended use.

	SAFETY MANUAL		Page 34 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

14.2. COSMETICS, HAIR, JEWELLERY

14.2.1. COSMETICS AND CONTACT LENSES

Application of cosmetics and the handling of contact lenses is **prohibited** in technical work areas.

Hand creams may be used.

NOTE Oil-based hand creams or lotions can cause deterioration of some glove material. are forbidden in the laboratory areas.

14.2.2. HAIR

Women's hair: must be tied and wear head-cover.

Men's hair: wear head-cover.

14.2.3. JEWELRY

That will affect to the staff safety and caught equipment or contaminated by infectious substances or chemical must not be worn in the laboratory.

14.3. SMOKING

Smoking is **prohibited** in the laboratory including electronic cigarettes.

14.4. PERSONAL PROPERTY

14.4.1. GENERAL CONSIDERATIONS

Personal property such as port able electronic devices, clothing, cosmetics, and beverage containers should not be placed in areas where contamination can occur.

For security and infection prevention and control purposes, these items should be kept in a secure storage area such as lockers (at offices).

14.4.2. PERSONAL ELECTRONIC DEVICES

Personal electronic devices (e.g cell **phones**, personal digital assistants, wireless communication devices, portable music players, and radios with headphones) shall not be used in the technical work area in the following circumstances:

- a. When working with hazardous materials of any category (chemical or biological).
- b. When wearing gloves or other PPE with the exception of a lab coat.
- c. While performing work in laboratory samples, data or process that can affect testing outcomes.
- d. When in an area in which they might distract or interrupt others.
- e. When in an area in which accidental release of protected health information could occur.

	SAFETY MANUAL		Page 35 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- f. If they interfere with an employee's ability to detect potential hazards, such as hearing an alarm or an approaching obstacle.

All personal electronic devices should be protected from laboratory hazards and possible contamination.

14.5. FESTIVE DECORATIONS

Festive and other decorations that present potential contamination and/or fire hazards should not be used in technical work areas.

Decorations should never be attached to lights, light fixtures or technical instruments.

14.6. HAND HYGIENE:

must be perform before and after performing lab activities and before leaving the laboratory, after toilet, before eating or smoking. Where is not applicable for hand washing sink must use Alcohol-based.

14.7. MOUTH PIPETTING

Mouth pipetting is forbidden in the laboratory.

14.8. SHARPS:

Needle must be re-cap be careful by one hand, all sharps must be placed in the sharp box, the sharp box must be placed below eye level and must be treated as biohazard waste.

- a. Sharps, including used needles, should not be sheared, bent, broken, recapped or re-sheathed by hand, or manually removed from syringes or holders.
- b. Reviews of working practices should include the objective to reduce the use of sharps wherever possible.
- c. Sharp objects for disposal, including needles, glass and disposable scalpels shall be placed in specified puncture-resistant containers immediately after use.
- d. Sharp containers should be placed within arm's reach, below eye level and not be filled to more than two-thirds of their capacity before replacement.
- e. Procedures for the safe disposal of the used containers and their contents shall take into account applicable local, regional and national statutory and regulatory requirements.

15. PERSONAL PROTECTIVE EQUIPMENT;

PROTECTIVE CLOTHING IN THE LABORATORY:

- PPE must be ready and adequate for all lab staff and visitors or maintenance service staff.
- PPE selection based on transition of pathogen that performing in the laboratory;
- Used lab coat and shoes must be soaked on Hypochlorite 10% before laundry.
- TB lab coat must be autoclaved before laundry.
- All disposal PPE must be treated as infectious waste;

	SAFETY MANUAL		Page 36 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

- Staff must be trained before use PPE.
- Clean protective clothing should only be hung on suitable devices provided for that purpose. These hooks shall be away from radiators, steam pipes, heating instruments, and open flames transport of samples and hazardous materials;
- PPE must be removed before leaving the laboratory.

NOTE: home-laundry is not allowed!

PROTECTIVE CLOTHING OUTSIDE THE LABORATORY:

Phlebotomists and other workers whose duties take them out of the laboratory should be required to wear clean coats, gowns or tunics while working with patients.

GOGGLES: Must be worn when handling hazardous material. Eye protection SHOULD be worn with contact lenses.

NOTE: Personal eye glasses and contact lenses are not considered adequate protection from splashes!

GLOVES: Should be available for use in the laboratory to provide protection: chemical, biological hazards, cold and heat.

- Choose for the right size, check for leak before use.
- Overlap the coat sleeves.
- Change between patient
- No re-use
- Remove before leaving the laboratory
- Dispose and treat as biohazard waste
- Lab workers must be trained before use.

NOTE: All telephones, doorknobs and handles, computer keyboards, keyboards, etc. are considered contaminated unless these areas/items are protected by a barrier that allows for decontamination

FOOTWEAR: Foot wear must be comfortable, with nonslip soles. Shoes shall cover the foot to include heel, toes and instep.

RESPIRATORY PROTECTION: Respiratory protection: using N95 for TB lab where is performing TB and COVID-19 testing,

Transport of samples and hazardous materials

 <p>ສູນວິໄຈພະຍາດອຸ້ມເຊັ່ນ ລາວ-ຄຣິສໂຕຟ ເມຣີເຢຽ Center Infectiology Lao-Christophe Merieux</p>	SAFETY MANUAL		Page 37 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

16. TRANSPORT OF SAMPLES AND HAZARDOUS MATERIALS

- For transport of specimens inside the facility, engineering controls such as carts, leak-proof carrying containers, and absorbent materials is being implemented.
- Personnel transporting specimens must use the appropriate PPE for the materials they are handling.
- All samples must be transported to the laboratory in such a manner as to prevent contamination of workers, patients, or the environment.
- It is presupposed that laboratories are aware of applicable statutory and regulatory requirements for specimen transport.
- Samples should be transported in approved, inherently safe, leak proof containers.
- Samples, cultures and other biological material transported between the laboratory or other facilities should be sent in a manner compliant with facility safety rules so as to ensure the integrity of the sample and the safety for the carrier, the general public and the receiving laboratory.

17. WASTE DISPOSAL;

HAZARDOUS WASTE:

- Biohazard waste must be discarded in the biohazard bag in the bins;
- Container must be leak proof and well labelling as biohazard;
- Sharp must be discarded in the sharp box;
- Waste container must be tied when it full as 2/3 of the bag, and remove to the autoclave room then replace a new biohazard bag.
- Transportation container must be leak-proof;
- Must be autoclave at 121°C and 45 minutes and incineration.

NON-HAZARDOUS WASTE:

- Discard in the normal waste bins;
- Filled containers must be removed from work area regular basic;
- Laboratory rubbish and routine paper waste that has not been contaminated with reagents or body fluids can be handled and processed as non-hazardous waste.

18. HOUSEKEEPING PRACTICES;

- Cleaning and disinfecting all equipment and work surfaces that are used for processing contaminated materials with appropriate agents at the end of each working shift and whenever spills or other contamination has occurred;
- Cleaning staff must be trained before starting perform the cleaning tasks.

Referred to: [ENP-SOP001: Decontamination and cleaning](#)

	SAFETY MANUAL		Page 38 of 38
	ISO15190:2022 / 5.6. Safety manual	Code : SSM-MAN001	Version: 06
		Application date: 24/10/2022	Next revision date: 24/10/2024

19. INCIDENTS, INJURY, ACCIDENTS AND, OCCUPATIONAL ILLNESSES;

All incident must be reported to Lab manager and Biosafety officer;

Staff must record the incident immediately after each incident include:

- Details/description, cause, recommendation to prevent re-occur
- Incident reports, including remedial actions, shall be reviewed by lab manager or lab director; safety committee or biosafety officer.
- The review should assess these opportunities for improvement and the need for any changes to policy, process or procedures.

Referred to: [Annex: 01-16.](#)

20. DOCUMENTATION

All the safety records are archived in the QUALITY CABINET.

21. ANNEXES:

- SSM-MAN001-ANN01 - MSDS Master List
- SSM-MAN001-ANN02 - Hand Washing job aid
- SSM-MAN001-ANN03 - Medicine instruction of use
- SSM-MAN001-ANN04 - First aid kit maintenance form
- SSM-MAN001-ANN05 - Spill kit job aid
- SSM-MAN001-ANN06 - Spill kit maintenance form
- SSM-MAN001-ANN07 - Disinfection when skin and eyes contact with infectious object
- SSM-MAN001-ANN08 - Emergency Shower job aid
- SSM-MAN001-ANN09 - Fire extinguisher job aid
- SSM-MAN001-ANN10 - Fire Blanket job aid
- SSM-MAN001-ANN11 - Normal Saline solution for eye wash instruction of use
- SSM-MAN001-ANN12 - Needle stick handle
- SSM-MAN001-ANN13 - Spill inside the BSC job aid
- SSM-MAN001-ANN14 - Hot water burn job aid
- SSM-MAN001-ANN15 - Ice Burn job aid
- SSM-MAN001-ANN16 – Contingency plan