

Implementation of Biological Inventory System in CPHL as a biosecurity measures

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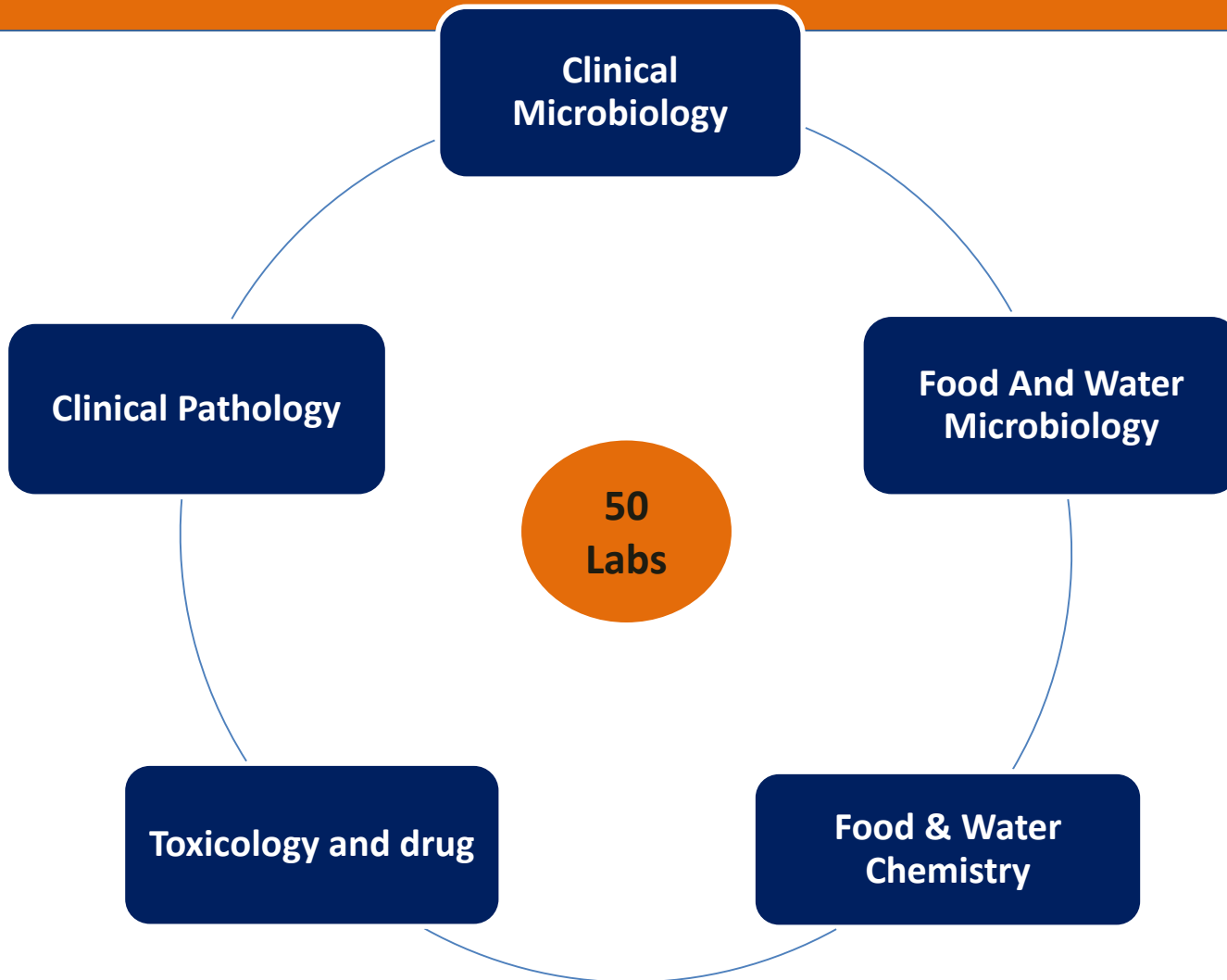
Biosafety Officer In CPHL
Biorisk management advisor in BRM MENA
network

Technical manager of food microbiology
department in CPHL



CPHL(MoHP)

General Technical Administrations



Overview (CPHL)

1

- ❑ Technical support to all clinical and testing laboratories in all governorates.
- ❑ Coordination and collaboration with communicable and surveillance department in sentinel site surveillance of SARI , ILI , pneumonia , meningitis ,AMR.

2

- ❑ Early detection of out breaks and provision of laboratory testing for confirmation .

3

Building capacity at different levels (central , periphery)

- ❑ Supervision and assessment
- ❑ Monitoring and follow up
- ❑ conduct workshops & On job training
- ❑ Evaluation

Overview (CPHL)

4

- ❑ Certifying all food handlers for infectious diseases
- ❑ culture and sensitivity for bacteria
- ❑ TB identification & Drug sensitivity.

5

- ❑ Serology, PCR, & Tissue culture for viral diseases
- ❑ Gene sequencing for measles, rubella and Influenza
- ❑ PCR for bacterial meningitis

6

- ❑ Testing water sources (drinking, dialysis, sewage)
- ❑ Testing food samples (imported & exported) for its availability for human consumption
- ❑ Detecting pesticides and heavy metals in food

Overview

7

- ❑ Laboratory testing and certifying all national citizen for visa applicant to gulf countries
- ❑ Laboratory confirmation and counseling for AIDS patient

8

- ❑ Testing samples for hematology , chemistry, tumor markers , hormones , metabolic disorders ,Pathology and drug abuse

The Service That Provided By Food microbiology department



Controls on **local** and **imported food** .

Examine the **materials** involved in **the manufacturing** of food item

Examine the cases of **food poisoning**

Detection of **various microbiological pollutants** for food

Technical supervision of laboratories involved in the provinces

Accreditation Certificates

ISO/IEC/17025:2012

Food Bacteriology labs had been accredited in 2009 and reaccredited 2013 and every year expanding the accreditation scope.

Water Bacteriology labs had been accredited since 2013 and expanded the accreditation scope in Jan 2016.

Pesticide residues lab in Toxicology department has been accredited from Jan 2016.

The accreditation renewed at 2021 with expanded scope to include all testing labs in CPHL .



Mycotoxins lab had been accredited since 2009 and expanded the accreditation scope in Jan 2016.

Food and Water chemical labs had been accredited since 2014 and expanded the accreditation scope in Jan 2016.

Heavy Metal lab has been accredited from Jan 2016.

Background

1

CPHL receives and sends out many types of biological samples because it is considered a reference lab for regional labs and is cooperating with international labs such as the CDC and WHO

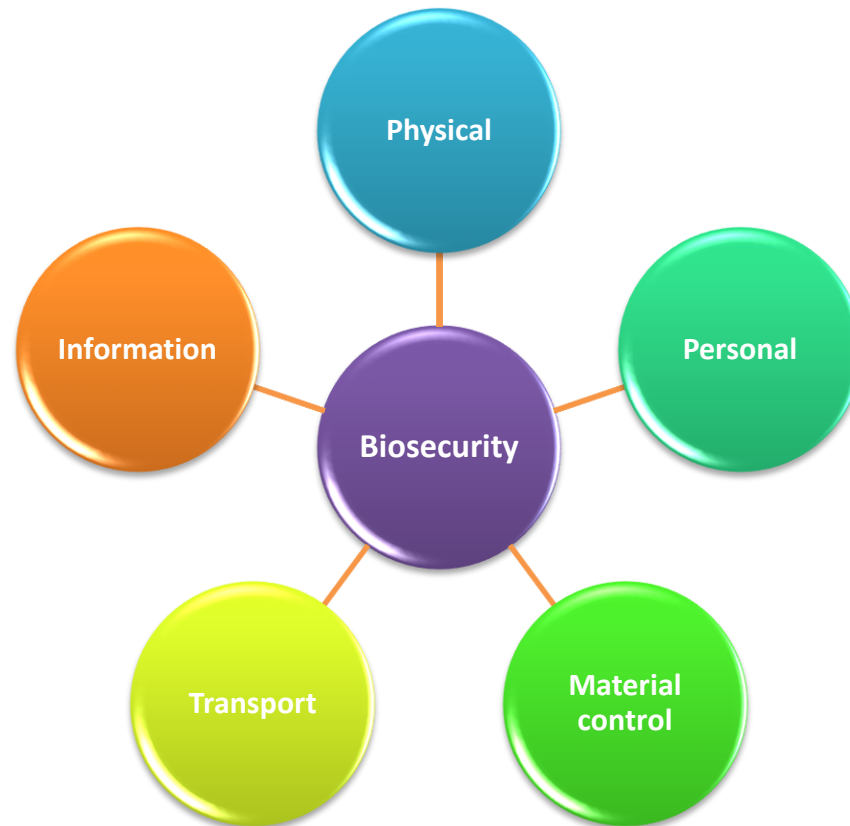
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CPHL did not have a biological inventory system in the clinical microbiology labs before this project

3

CPHL recognizes that implementation of a biological inventory system is very important for biosecurity in clinical microbiological labs as part of a biosafety program

Pillars of biosecurity



Biosecurity Risk Mitigation-5 Pillars

Physical security

- Only authorized individuals are allowed to access
- Defined perimeter
- Access controls
- Intrusion detection



Personal security

- Ask about who is authorized
- Personnel screening
- Visitor control
- Badges

Material Control & Responsibility

- What materials exist
- Where materials exist
- Who is responsible



Biosecurity Risk Mitigation-5 Pillars

Transport security

- Transferring materials between laboratories
- Package's physical security
- Who handles package?
- Reliable carriers
- Who is recipient?

Information security

- Protecting sensitive information from public release
 - Identify what is the sensitive information
 - Communication security
 - Network security (IT security)
-

Goals/objectives

- Document biological agents and amount in lab
- Enhancement of biosecurity in CPHL
- Standardization of lab practices and procedures for handling biological agents
- Enhancement of biosafety with development of pathogen safety data sheet (PSDS) hand book
- Increase awareness of biosafety and biosecurity

Methods



Determine the Gaps in biological inventory

Assign A person for biological inventory in each lab

Write and update PSDS for each pathogen

Create of inventory forms and SOPs

Train laboratory staff on inventory SOPs

Inventory log book

Reassess of inventory system

Results of pre assessment of inventory in clinical microbiology labs

- No assigned person for biological inventory
- No access control
- Most of labs don't have PSDS hand book
- No backup for storage
- Most of labs don't have inventory log book
- Most of labs don't know how to deactivate or dispose biological materials
- Most of labs don't segregate stock culture from working culture



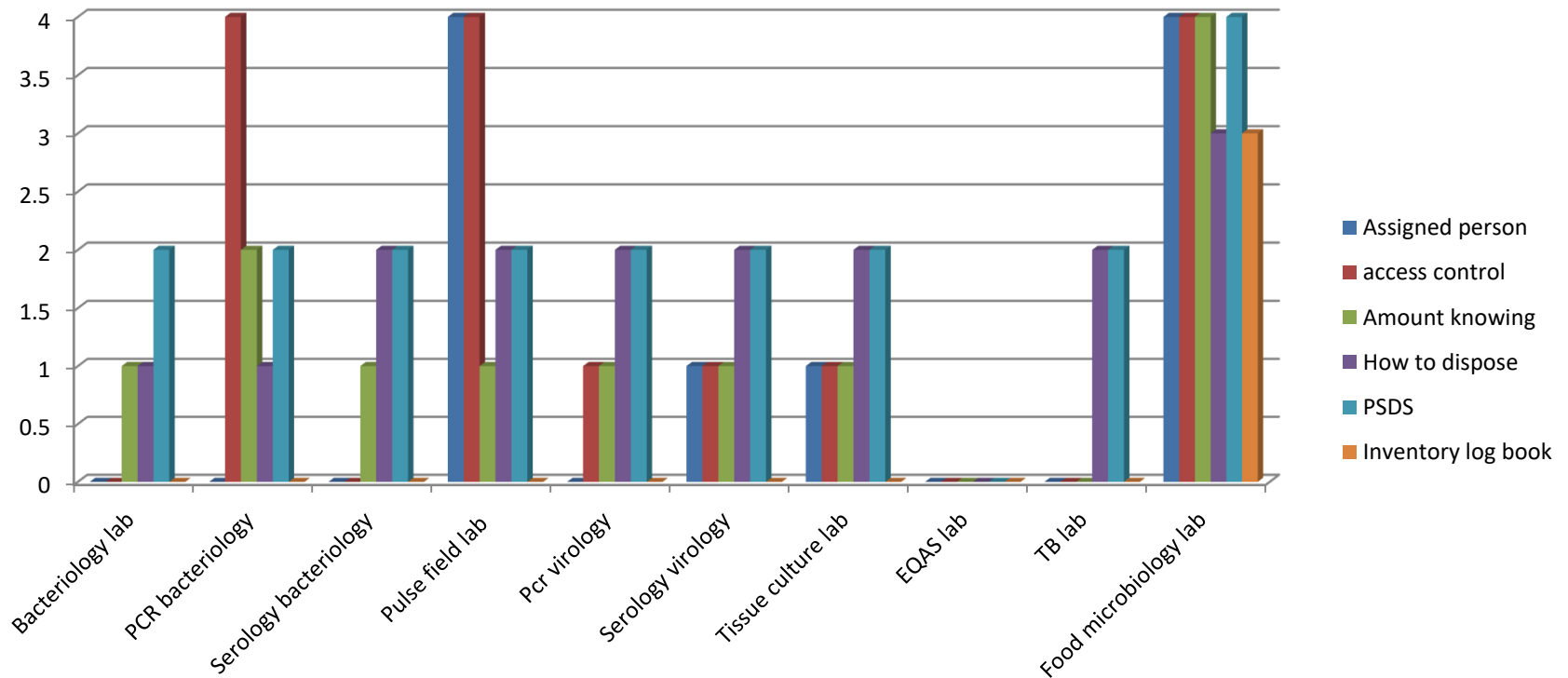
ASSESSMENT OF INVENTORY IN CLINICAL MICROBIOLOGY LABS

Evaluation of pre-implementation of the biological inventory system
score rating is 0-4

<u>0</u>	Procedures and practices do not exist
<u>1</u>	Some Practices and Procedures exist but most not implemented
<u>2</u>	Most practices and procedures exist and somewhat implemented
<u>3</u>	Practices and Procedures exist and implemented and staff are Trained
<u>4</u>	Practices and Procedures fully implemented



PRE ASSESSMENT OF BIOLOGICAL INVENTORY SYSTEM



Before project (bad inventory)



After implementation (good inventory)



Initial Inventory of New Select

Agent Acquisitions

Please use a separate form for each new select agent

and new strains of existing select agents

Initial Acquisition Source Reference Number to be completed by EH&S. This number will be used as a reference on the Monthly Inventory Control Form. EH&S will return a copy of this completed form to the select agent PI.

Name of Select Agent:

Strain:

Characteristics:

Source:

Date Acquired:

Quantity Acquired:

Storage Location of Agent:

Principal Investigator, (PI):

_____/_____/_____

(Print Name)

(Signature)

(Date)

Responsible Official, (RO) or Alternate Responsible Official, (ARO):

_____/_____/_____

(Print Name)

(Signature)

(Date)

I: Acquisitions / Productions:

Strain	Date of Agent's Acquisition / Production	Quantity Acquired / Produced (vials, tubes, containers, etc.)	Acquisitions Only		
			From (whom/entity)	Location of person/entity	Type of Acquisition, i.e., Internal or External

II : Transfers:

Strain	Date of Agent's Transfer	Quantity Transferred	To (whom/entity)	Location of person/entity	Type of Transfer (i.e., Internal or External)

III: Depletions / Destructions:

Strain	Date of Agent's Depletion or Destruction	Quantity Depleted / Destroyed	Method of Destruction (if applicable)

Investigator (PI) _____
 Name (print) Signature Date

mental Health & Safety _____

Name (print) Signature Date



for

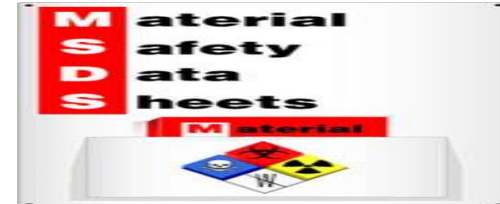
INVENTORY CHANGES

[illegible][illegible]

Name (print) _____ Signature _____ Date _____

Name (print)	Signature	Date
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PSDS



Science Lab.com
Chemicals & Laboratory Equipment

Material Safety Data Sheet
Sodium chloride MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium chloride
Catalog Codes: SLS3262, SLS1045, SLS3889, SLS1669, SLS3091
CAS#: 7647-14-5
RTECS: VZ4725000
TSCA: TSCA 8(b) inventory: Sodium chloride
CI#: Not applicable.
Synonym: Salt; Sea Salt
Chemical Name: Sodium chloride
Chemical Formula: NaCl

Contact Information:
Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396
US Sales: 1-800-901-7247
International Sales: 1-281-441-4400
Order Online: ScienceLab.com
CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
International CHEMTREC, call: 1-703-527-3887
For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Name	CAS #	% by Weight
Sodium chloride	7647-14-5	100

Toxicological Data on Ingredients: Sodium chloride: ORAL (LD50): Acute: 3000 mg/kg [Rat.], 4000 mg/kg [Mouse]. DERMAL (LD50): Acute: >10000 mg/kg [Rabbit]. DUST (LC50): Acute: >42000 mg/m 1 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:

Escherichia coli, enterohemorrhagic - Material Safety Data Sheets (MSDS) Page 1 of 3

Public Health Agency of Canada **Agence de la santé publique du Canada** **Canada**

Home > Emergency Preparedness > Laboratory Security > Material Safety Data Sheets (MSDS) - Infectious Substances > Escherichia coli, enterohemorrhagic - Material Safety Data Sheets (MSDS)

Escherichia coli, enterohemorrhagic - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Escherichia coli*, enterohemorrhagic

SYNONYM OR CROSS REFERENCE: Enterohemorrhagic *Escherichia coli* (EHEC), Verotoxin producing *Escherichia coli* (VTEC), Shiga toxin producing *Escherichia coli* (STEC)

CHARACTERISTICS: Gram negative rod; motile, aerobic; produce Vero / Shiga toxins (VT/Stx), 2 types, VT1/Stx1 and VT2/Stx2; serotyping to determine somatic and flagellar antigens

SECTION II - HEALTH HAZARD

PATHOGENICITY: Hemorrhagic colitis, intestinal disease accompanied by cramps and abdominal pain; initially watery, followed by bloody diarrhea; low grade fever; last about 8 days; 5-10% of hemorrhagic colitis victims may develop hemolytic uremic syndrome (HUS); affects all ages, higher death rates occur in elderly and young; can cause thrombocytopenic purpura (TTP) in elderly

EPIDEMIOLOGY: Sporadic and in outbreaks of bloody diarrhea; associated with 15-30% of patients where no other pathogen has been identified; main EHEC serotype in North America from infections is *E. coli* O157:H7

HOST RANGE: Humans; animals (O157:H7 - piglets, calves and cattle)

INFECTIOUS DOSE: Appears to have low infectious dose, may be similar to that of *Shigella* spp., 10 organisms by ingestion

MODE OF TRANSMISSION: Ingestion of contaminated food (undercooked hamburger meat, unpasteurized milk); fecal-oral transmission; person-to-person transmission (extremely high)

INCUBATION PERIOD: 2-8 days (median of 3-4 days)

COMMUNICABILITY: Communicable for duration of fecal excretion (7-9 days); 3 weeks in one third of children

SECTION III - DISSEMINATION

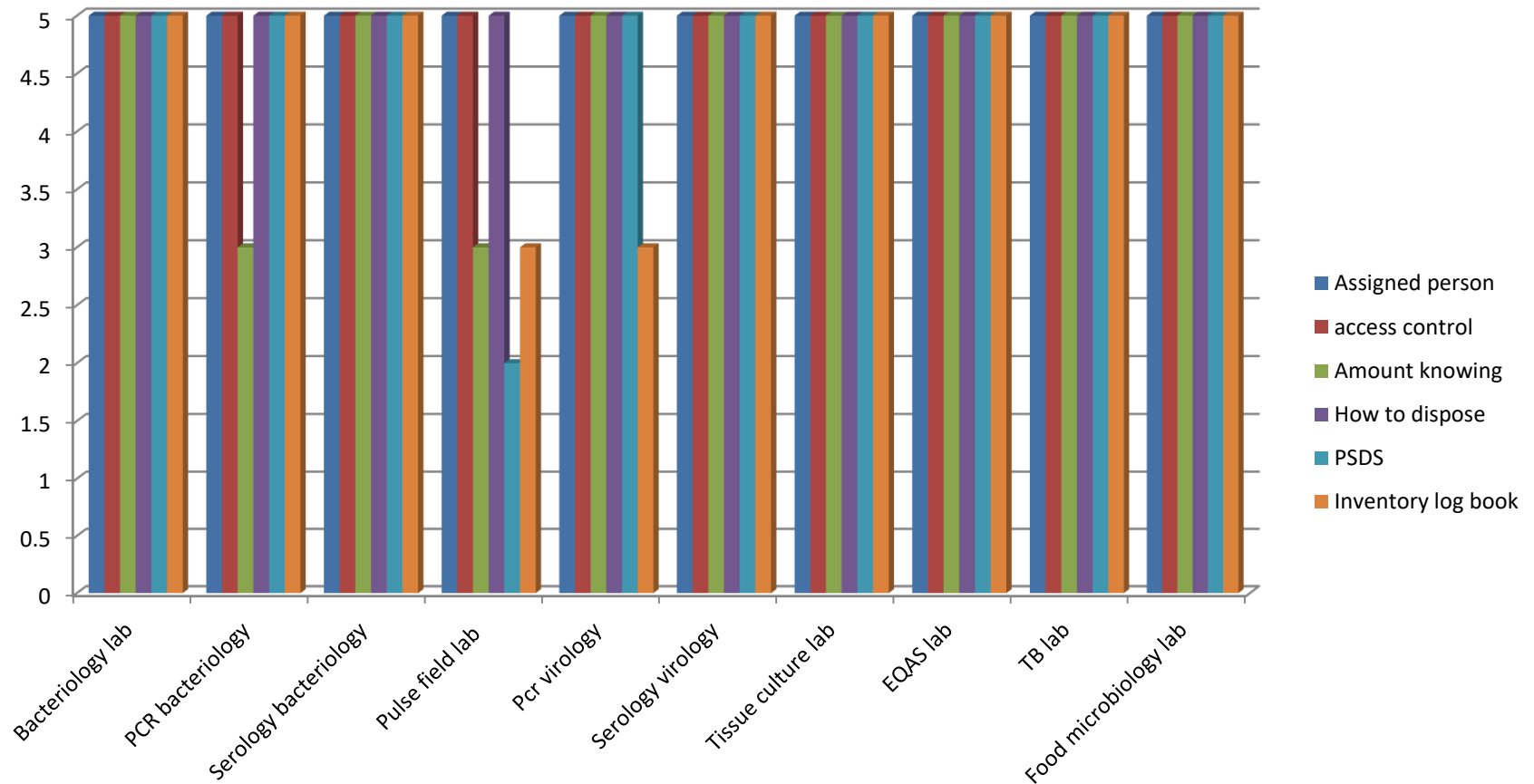
RESERVOIR: Infected persons, animals (sheep, goats, pigs, poultry, calves, cattle)

ZOOONOSIS: Yes - direct or indirect contact with infected animal and waste

VECTORS: birds may be a vector

SECTION IV - VIABILITY

Results of post assessment of biological inventory system



Results

- Identified and Prioritized Biological Materials to be secured
- Documented necessary resources for inventory log book, access control and monitoring
- Inventory forms, SOPs and training developed
- Biological agent inventory log book and PSDS hand book completed for 10 microbiology labs
- Three training sessions completed for 90 lab staff members

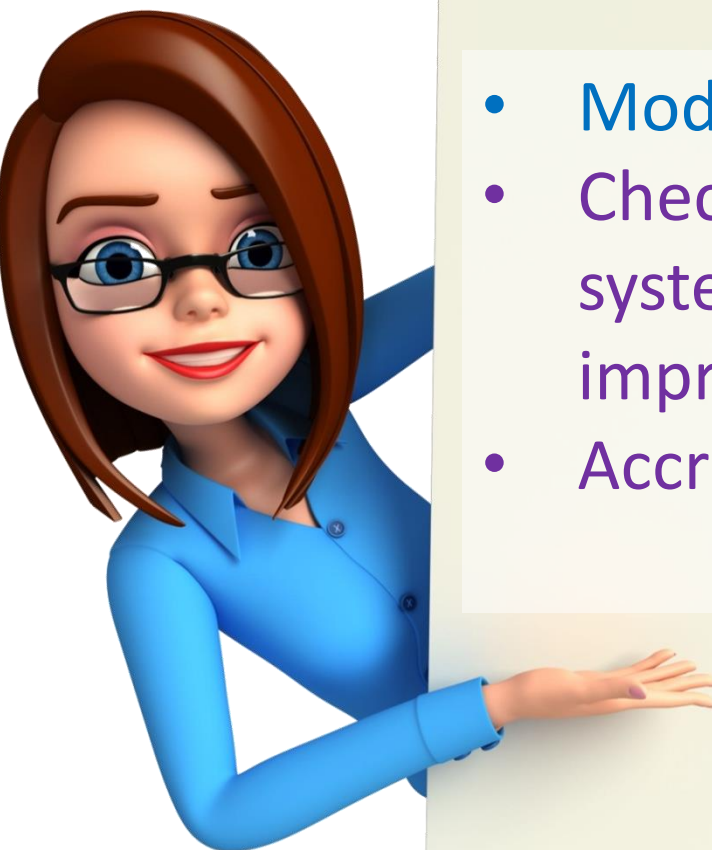
Lesson learned

- Implementation of inventory system in labs is very important as a biosecurity improvement
- How to collect and use data for inventory
- How to create biological inventory log book
- Leading my lab team & motivate them
- Effective time management
- Delegate responsibility to others when possible to right person
- Managing Conflicts in the Lab
- Importance of team work
- How can we over come our challenges

Conclusion

- The project plays an important role in improvement of biosecurity in CPHL as the implementation of biological inventory system is considered one of the effective type of biosecurity and will be a foundation for implementation of inventory system across the affiliated labs

Future Goals

- 
- Model for affiliated laboratories
 - Checklist for biological inventory system/ continuous program improvement & training
 - Accreditation ISO 350001

