Philippines National TB Control Program

Enhanced TB Microscopy Training of Trainers
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**About SIAPS**

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

**Recommended Citation**

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**Systems for Improved Access to Pharmaceuticals and Services**

**Center for Pharmaceutical Management**

Management Sciences for Health

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Website: www.siapsprogram.org
# ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFB</td>
<td>acid-fast bacilli</td>
</tr>
<tr>
<td>DOH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>EQA</td>
<td>external quality assessment</td>
</tr>
<tr>
<td>HFN</td>
<td>high false negative</td>
</tr>
<tr>
<td>HFP</td>
<td>high false positive</td>
</tr>
<tr>
<td>LFN</td>
<td>low false negative</td>
</tr>
<tr>
<td>LFP</td>
<td>low false positive</td>
</tr>
<tr>
<td>MjQE</td>
<td>major quantification error</td>
</tr>
<tr>
<td>MnQE</td>
<td>minor quantification error</td>
</tr>
<tr>
<td>NTP</td>
<td>National TB Program</td>
</tr>
<tr>
<td>NTRL</td>
<td>National TB Reference Laboratory</td>
</tr>
<tr>
<td>OIF</td>
<td>oil immersion field</td>
</tr>
<tr>
<td>RO-7</td>
<td>DOH Regional Office for Central Visayas</td>
</tr>
<tr>
<td>RO-9</td>
<td>DOH Regional Office for Zamboanga Peninsula</td>
</tr>
<tr>
<td>SIAPS</td>
<td>Systems for Improved Access to Pharmaceuticals and Services</td>
</tr>
<tr>
<td>TDU</td>
<td>Training and Development Unit, NTRL</td>
</tr>
<tr>
<td>TOT</td>
<td>training of trainers</td>
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</table>
This document is a compilation of the training materials used for the course entitled “Enhanced TB Microscopy Training of Trainers.” The course was held on July 25 to 29, 2016, at the Cebu TB Reference Laboratory in Cebu City, Philippines, and is part of the activities under the National TB Program (NTP) Laboratory Training Decentralization Strategy. This training of trainers (TOT) was planned, organized, and implemented jointly by SIAPS/PH, the National TB Reference Laboratory (NTRL), and the Department of Health (DOH) Regional Office for Central Visayas (RO-7).

The training design and the materials used for this course were developed by a team of senior trainers composed of staff from NTRL, DOH Central Visayas (RO-7), DOH Zamboanga Peninsula (RO-9) and SIAPS/PH technical advisors. This team also conducted the training.

The development process was underway from March to June 2016 and involved the review and updating of the previous TOT’s topics and presentation materials; development of new topics and their respective materials; creation of competency rubrics; and preparation of standardized training smear slides. Logistical and financial support for these activities was provided by SIAPS and DOH RO-7.

The materials for this course were designed so that they can be used in the original or modified version in future TOTs for TB microscopy or for other NTP laboratory training. Trainers from the NTP will benefit from these materials as they will find them useful when they plan and conduct future trainings.

Arthur B. Lagos, MD
Lynette P. Adorio-Arce, MD, PhD
SIAPS Philippines
Metro Manila
March 2017
ACKNOWLEDGMENTS

The enhanced microscopy training of trainers was successfully conducted through the invaluable support of the following individuals:

1. National Tuberculosis Reference Laboratory
   Dr. Cecilia G. Ama (Head)

2. Senior trainers
   Lucy B. Aguiman RMT (Regional Coordinator DOH-RO7)
   Joselito L. Cua, RMT (Regional NTP Coordinator DOH-RO9)
   Marienella Galit (NTRL)

3. Course management team
   Ryan Castro RMT (Head, NTRL-TDU); Cresilda C. Tobe RMT (Regional NTP Medical Technologist Coordinator, DOH-RO7); Angela Carla De Ocampo RN (NTRL-TDU); Paola Angeleca Gargantiel RMT (NTRL-TDU); Karen Cavite RN (NTRL-TDU); Marlon L. Bayot, RMT (SIAPS); Dorotea Bacalso RMT (SIAPS Consultant)

4. DOH Central Visayas (RO7)
   Director Jaime S. Bernadas, MD, MGM, CESO III (Director IV)
   Dr. Jonathan Erasmo, MD, MPH (Chief, Local Health Support Division)
   Dr. Sharon Laurel (NTP Medical Coordinator)

5. Cebu City Health Office
   Dr. Alma S. Corpin, MD, RN (OIC, Cebu City Health Office)
INTRODUCTION

The process of decentralizing laboratory trainings was started in 2016 to address backlogs in laboratory training. The decentralization strategy was designed to build the capacity of intermediate-level (regional and provincial/city) offices and program managers who are functioning as trainers and managers in the NTP laboratory training program.

One of the activities in the capacity-building process is to enhance the training of trainers (TOT) course, starting with the training on sputum-smear microscopy. The enhancement of this TOT course aims to broaden the participants’ competencies in conducting and managing the microscopy training program in their respective regions or localities. The desired competencies include (a) effective training skills; (b) correct assessment of smear quality and microscopy reading; (c) providing effective feedback; (d) management and use of training data; (e) effective report writing; (f) training management including planning, monitoring and evaluating the training program; and (g) assessing trainees’ performance in the laboratory and providing technical support for improvement. The changes in this TOT course include:

1. Expansion of the content of previous topics such as quality assurance, biosafety, waste management, and planning. In the previous course, these topics were discussed only briefly and treated as “nice to know” information. The change was made to increase participants’ awareness and knowledge and to highlight the significance of quality assurance methods and approaches, safe working practices, and the environmental impact of laboratory waste materials and waste management practices.

2. Review, update, and shift in discussion focus. The content for sessions on assessing smear quality and slide reading were reviewed and improved. In this version, addressing systemic issues was emphasized, in addition to lab techniques; previously, the focus was on lab techniques alone.

3. Improving teaching methods to facilitate learning. In previous courses, lectures were used exclusively to provide information; individual exercises were utilized to develop the trainers’ skills in performance assessment and coaching. In this course, there was more use of discussions and group work to promote experiential learning using one’s own and other participants’ experiences to learn new knowledge, skills, practices, and attitudes.

4. Enhanced communication and presentation skills by expanding the session on developing effective presentations.

5. Inclusion of new topics relevant to training managers:
   a. Overview of the training process and training management to increase knowledge and skills in training-program management and implementation
b. Management of training data to improve participants’ capabilities in the analysis and use of training data to better understand trainees’ performance

c. Writing skills to improve training reports so that they are more useful for managing and improving training programs

d. Monitoring and evaluation of the training program

6. Standardized rubrics to measure performance: In previous trainings, the desired competencies were not clearly defined or measured. This course uses standardized rubrics to measure participants’ performance during training.

7. Streamlined schedule (program agenda) to improve efficiency and time management within the stated duration of training, despite the additional topics. The activities were arranged in the proper sequence and the amount of time for each topic was revised to ensure adequate time to tackle the topics’ activities.

**Course Methods**

This course utilizes adult-learning and experiential approaches to facilitate learning, such as short lectures, presentations, plenary and small group discussions, group and individual exercises, role play, and readings. Off-session informal sessions and tutorials were held to provide the trainees more opportunities to discuss, share, and increase learning.

**Certification**

At the end of the workshop, a certificate of attendance will be given to participants who met the workshop requirements. A certificate of training will be given to participants who have applied the learned competencies in a formal microscopy training session under the supervision of NTRL and DOH senior trainers.
SESSION 1. OVERVIEW OF THE TRAINING PROCESS AND TRAINING MANAGEMENT

This session discusses the differences between training capacity-building, the steps in the training process, and management of training. Participants with experience in training management and implementation are encouraged to share their insights.

Objectives

At the end of the session, participants will be able to:

1. Describe the difference between capacity building and training
2. Enumerate the steps in the training management cycle
3. Enumerate the steps in the training process

Methods

1. Presentation and discussion
2. Exercise (designing training and learning objectives) using a training planning matrix

Materials

1. PowerPoint presentation
2. Training planning matrix

Session activity

Presentation and discussion

Desired competencies

1. Able to develop a training plan by filling out the training planning matrix

Duration: 1 hour 45 minutes
Training of Trainers
Basic TB Microscopy Training Course
Cebu TB Reference Laboratory, Cebu City
July 25-29, 2016

Session 1
Overview of the Training Process
and Training Management

Authors: Arthur B. Lagos MD, Lynette P. Adorio-Arce MD
Management Sciencesfor Health

What is the session all about?

☐ We will discuss the elements of capacity building and training, and look at the differences between them.

☐ We will introduce to you the steps (1) in training management and (2) in the training process.
Session objectives

- At the end of the session, the participants will be able to:
  - Describe the difference between capacity building and training,
  - Enumerate the steps in the training management cycle,
  - Enumerate the steps in the training process.

Capacity building
What is capacity building?

- A process that aims to enhance the ability to evaluate and address crucial questions related to policies and implementation of development options based on an understanding of the needs, as perceived by the people, and of the environment’s potentials and limitations.
  (Adapted from UNDP, 1997)

- It aims to address the needs of the institution, or organization, and individuals.

- A long-term continuing process involving all stakeholders

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Elements of capacity building

- Capacity building includes the following elements:

  1. The creation of an enabling environment with appropriate policy and legal frameworks
  2. Organizational development
  3. Human resource development
  4. Strengthening managerial systems
Capacity building:

1. Institutional and legal framework development

- Creation of an enabling environment with the appropriate institutional and legal framework, and regulations through policies, standards, and guidelines.

- This enables the organizations, institutions, and agencies at all levels and in all sectors to enhance their capacities.

2. Organizational development

- Planned development and reinforcement of organizational strategies, structures, and processes to improve the organization's effectiveness. (Cummings and Worley)

- Planned, systematic change in employees' attitudes, beliefs, and values through long-term training programs.

- This enables the organization to adapt to the fast-changing external environment - community, new markets, regulations, and technologies.
Capacity building:

3. Human resource development

- Human resources is the set of *individuals* who make up the workforce of an organization, business sector, or an economy.

- Human resource development (HRD) is the integrated use of *training, organizational development, and career development* to improve individual, group, and organizational effectiveness.

  (http://www.xavier.edu/human-resource-development/)

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Capacity building:

4. Strengthening Management Systems

- Management system is a *framework of policies, processes and procedures* used by an organization to ensure that it can fulfill all the tasks required to achieve its objectives. (Wikipedia)

- It is designed for continuous improvement through a cycle of *planning, implementing, evaluating and reviewing*.

  Occupational Health and Safety Management System Model, Australia/New Zealand Standard.
### Complexity and time dimensions of capacity building

**Level of complexity**

- Easier and more technical
- Harder and more socio-cultural

**Time to implement change**

- Tools
- Individual capacity building
- Training (skills building)
- Staff and facilities
- Institutional capacity building
- Structures, Systems and Roles

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### Example of capacity building framework:

**The Fully Functional TB Diagnostic Services Framework for the Philippines**


**Inputs**
- Infrastructure, Equipment
- Consumables, Transport, Staff and Mone

**Systems & Processes**
- Leadership and Management
- Planning, Laboratory organization (including & referral systems)
- Quality Improvement systems and EQA
- Supply chain management
- Equipment management, Labatic
- Information management, Human resource management, Supervision, Monitoring and evaluation, Infection control, Waste management and Health promotion

**Measurable Outputs**
- Proficient staff
- High quality, reliable test results
- Accredited laboratories
- Service efficiency
- Increased clinician confidence in laboratory performance and Patient satisfaction

**Outcomes: Clinical & Public Health Impact**
- Decreased morbidity & mortality
- Rapid diagnosis and treatment for individuals
- Increased TB case detection rate
- Early & increased detection of drug resistance
- Reduction of relapse defaulter
- Early detection of treatment adherence problems and treatment failures

Providing quality TB diagnostic services requires robust policy, governance and regulatory framework to guide the provision of quality inputs as well as essential systems and processes. All of these must be present together, and managed efficiently and effectively, in order to ensure fully-functional TB diagnostic services. This will produce improved sustainable and measurable outputs that will influence outcomes and impact the quality of care and control of tuberculosis.
Training Management

What is Training?

- Training is an organized activity aimed at imparting information and/or instructions to improve performance or help attain a required level of knowledge or skill. (http://www.businessdictionary.com/definition/training.html#kaz4E5k2W73t)

- Training tries to reduce or eliminate the “performance gap”
  - By equipping workers with knowledge and skills, and
  - By encouraging them to build and enhance their capabilities.

- In training, improving the capability of workers to solve an identified problem is considered a unique service.
Training management cycle

- Training management
  Application of knowledge, skills, tools and techniques to training activities to achieve the desired outcome of training.

- The Training Management Cycle
  A conceptual framework to manage the training as a cycle that includes the following steps:
  1. Planning
  2. Implementation
  3. Evaluation
  
  3 steps

Training management cycle:

1. Planning

- Planning is a process that includes the following steps:
  1. Training Needs Assessment - identify and prioritize training needs and objectives
  
  2. Training Planning - creation of the Training Plan shows a clear picture of how participants will apply the skills, techniques, and knowledge that they acquired from the training.
  
  3. Training Preparation – determine the tasks to be done; prepare materials; sequence of activities and time required; and budget (estimated costs)
Training management cycle:

2. Implementation

- Implementation is the execution of **planned activities according to a pre-fixed timeframe**.

- In this process, some flexibility is important but the project has a **fixed timeframe**. A significant delay can create a negative impact on the results.

- If **planning** is well done, it is not difficult to implement training.

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Training management cycle:

3. Evaluation

- Evaluation is crucial for collecting lessons learned from previous training.

- Training accomplishment is measured.
  - If accomplishment is **below expectations**, hindering factors are examined.
  - If an **unexpected positive impact** is realized, critical success factors are identified and analyzed.

- Such information will be useful for improving similar training in the future.
The Training Process

Training process 1/4

- The training process consists of the following:
  
  1. Identify Training Needs (Training Needs Assessment)
  
  2. Establish Specific Objectives
  
  3. Select training methods
  
  4. Implement the training
  
  5. Evaluate the training program
  
  6. Feedback evaluation results

6 steps
Training process 2/4

1. Identify Training Needs
   - Training need measures the difference between standard (desired) performance and actual performance – this is the performance gap.

2. Establish Specific Objectives
   - After TNA, determine and prioritize training objectives
   - Formulate training objectives; focus on reducing or eliminating the performance gap.
   - The goal of training is to bring the worker to the desired level of performance.

Training process 3/4

3. Select training methods based on organizational training needs and resources.
   1. Instructor-led or classroom training (lectures, presentations)
   2. Interactive training (quiz, case studies, group discussions)
   3. Hands-on training (coaching, demonstration, apprenticeships)
   4. Computer-based training
   5. Online or e-learning (audio or video-conferencing, web meetings, email)
Training process 3/4

4. Implement Programs
   ▪ The prepared plans and programs are implemented
   ▪ Employees are trained for better performance of organizational activities

5. Evaluate Program
   ▪ Evaluation of various aspects of training to know whether the training program was effective.
   ▪ Measures the effect of training on employees' performance
   ▪ Provides information for improvement of future training

Training process 4/4

6. Feedback or reporting of evaluation results
   ▪ Identify the users of the report... primary users are the project managers, directors, donors or other decision makers.
   ▪ Use an appropriate form of communication depending on the readers' perspective and information needs.
   ▪ Outline of an evaluation report: (1) Summary, (2) Program Description, (3) Evaluation Design Methods, (4) Findings and Results, (5) Recommendations and (6) Appendices.
## Sample Training Plan Matrix

Adapted from: Designing Training Plans and Learning Objectives, Carlin McMahon. (http://managementfirst.org/learning-systematic/designing-learning.html)

<table>
<thead>
<tr>
<th>Training Goal</th>
<th>Learning Objectives</th>
<th>Learning Methods / Activities</th>
<th>Documentation / Evidence of learning</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

**Training Goal**
- Overall results or capabilities and competencies that workers aim to achieve through training
- Example: 1. Pass the lab supervisor qualification exam

**Learning Objectives**
- What workers **will be able to do** as a result of the learning activities in this plan
- Examples: 1. Exhibit required skills in problem solving and decision making 2. Show required skills in delegation

**Learning Methods / Activities**
- What workers **will do** in order to achieve the learning objectives.
- Examples: 1. Complete a course in basic supervision 2. Address a major problem that includes making major decisions

**Documentation / Evidence of learning**
- Evidence produced during training. These are results that someone can see, hear, feel, read or smell.
- Examples: 1. Course grade 2. Written evaluation of your problem solving and decision making approaches

**Evaluation**
- Assessment of evidence in order to conclude whether worker achieved the learning objectives.
Session 1. Overview of the Training Process and Training Management

Summary 1: Capacity building

- Capacity building is more than training
- It is a long-term continuing process involving all stakeholders and includes 4 elements:
  1. Creation of appropriate policy and legal framework to enable the environment
  2. Organizational development
  3. Human resource development
  4. Strengthening managerial systems

Summary 2: Training Management Cycle

- Training management cycle is a conceptual framework to manage training as a cycle.

- The cycle includes 3 steps:
  1. Planning
  2. Implementation
  3. Evaluation
Summary 3: Training Process

- Training is an organized activity that aims to improve performance and tries to reduce or eliminate the “performance gap” by providing workers with knowledge and skills, and by encouraging them to build and enhance their capabilities.

- The steps in the process are:
  1. Assess Training Needs
  2. Create Specific Objectives
  3. Select training methods
  4. Implement the training
  5. Evaluate the training
  6. Feedback the evaluation results

References

SESSION 1 WORKSHEET. TRAINING PLAN MATRIX

*Enhanced TOT on Basic TB Microscopy*

<table>
<thead>
<tr>
<th>Training goal</th>
<th>Learning objectives</th>
<th>Learning methods/ activities</th>
<th>Documentation/evidence of learning</th>
<th>Evaluation</th>
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</thead>
<tbody>
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<td></td>
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</tr>
</tbody>
</table>
Enhanced TOT on Basic TB Microscopy

Session 1: Training Planning Competency Scoring Rubric

Name of trainee: ____________________ Roster number: ____________________
Position and area of assignment: ____________________

<table>
<thead>
<tr>
<th>Indicators</th>
<th>%</th>
<th>Rating</th>
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<tbody>
<tr>
<td>Training goal</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Learning objectives</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Learning methods/activities</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Documentation/evidence of learning</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
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<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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</table>

Passing score: 90%
SESSION 2: LABORATORY BIOSAFETY, WASTE MANAGEMENT, AND QUALITY CONTROL

SESSION 2A: PRINCIPLES AND PRACTICES OF TB LABORATORY BIOSAFETY

This session provides an overview of the principles and standard practices in laboratory safety. It also describes approaches to prevent infections arising from the handling of hazardous materials, such as specimens and waste materials in the TB laboratory.

Objectives

At the end of the session the participants will be able to:

1. Enumerate the principles of biosafety in the TB laboratory
2. Enumerate the practices of biosafety in the TB laboratory

Methods

Lecture, discussion, home reading

Materials

1. PowerPoint presentation
2. Handouts

Session activity

Presentation and discussion of principles and practices in biosafety

Desired competencies

1. Understand the principles of biosafety in the TB laboratory
2. Understand the practices of biosafety in the TB laboratory

Duration: 30 minutes
Training of Trainers on TB Microscopy

Session 2:
BIOSAFETY PRINCIPLES & PRACTICES

Marienella P. Galit
Senior Science Research Specialist
National TB Reference Laboratory
Research Institute for Tropical Medicine

SESSION OBJECTIVES

- Explain the importance of biosafety in TB Laboratory
- Define Key terms: hazard, biohazard, risk and biosafety
- Describe biosafety principles and practices:
  - Hierarchy of Controls
  - Administrative Controls
  - Good Laboratory Practices
  - Containments
  - Biosafety levels
SESSION OBJECTIVES

- Describe the process of protecting laboratory worker’s health
- Discuss the biosafety measures in the different procedures in Mycobacteriology laboratory

CONTENT OUTLINE

1. Importance of Biosafety in TB Laboratory
2. Definition of Key Terms:
   - Hazard
   - Biohazard
   - Risk
   - Biosafety

3. Laboratory Biosafety principles and practices
   - Hierarchy of Controls
   - Administrative Controls
   - Good Laboratory Practices
   - Containments
   - Biosafety levels
CONTENT OUTLINE

3. Process of Protecting Lab Worker’s Health

4. Classification of TB Laboratory
   – Low-risk Laboratory
   – Medium-risk Laboratory
   – High-risk Laboratory

Why is Biosafety Needed in Mycobacteriology Laboratory?

• Risk of infection with *Mycobacterium tuberculosis* is 3-9x higher for TB lab workers than for other lab workers

• Infection usually results from unrecognized production of infectious aerosols containing tubercle bacilli
Risk of occupational TB in NTP laboratories in Korea
(Int J Tub Lung Dis 2007; 11(2): 138-142)

Table 2. Rate ratios of laboratory technicians’ risk of contracting tuberculosis according to specific laboratory procedures.

<table>
<thead>
<tr>
<th>Type of work</th>
<th>Rate ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microscopy vs. non-laboratory workers</td>
<td>1.4</td>
<td>0.2-10.0</td>
</tr>
<tr>
<td>Culture vs. non-laboratory workers</td>
<td>2.6</td>
<td>0.2-13.3</td>
</tr>
<tr>
<td>Culture vs. microscopy</td>
<td>1.1</td>
<td>0.2-9.5</td>
</tr>
<tr>
<td>DST vs. non-laboratory workers</td>
<td>21.1</td>
<td>4.5-102.5</td>
</tr>
<tr>
<td>DST vs. microscopy</td>
<td>15.8</td>
<td>3.2-72.9</td>
</tr>
<tr>
<td>DST vs. culture</td>
<td>11.4</td>
<td>2.4-54.2</td>
</tr>
</tbody>
</table>

Cl = confidence interval; DST = drug susceptibility testing.

OCCUPATIONAL DISEASES All Industries
(Establishments employing 20 and over)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>2011</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cases</td>
<td>85,483</td>
<td></td>
</tr>
<tr>
<td>1. Work-Related Musculoskeletal Diseases</td>
<td>45,572</td>
<td>53.31%</td>
</tr>
<tr>
<td>2. Cardiovascular Diseases</td>
<td>13,271</td>
<td>15.52%</td>
</tr>
<tr>
<td>3. Peptic ulcer</td>
<td>6,967</td>
<td>8.15%</td>
</tr>
<tr>
<td>4. Tuberculosis</td>
<td>4,505</td>
<td>5.27%</td>
</tr>
<tr>
<td>5. Occupational Dermatitis</td>
<td>4,374</td>
<td>5.11%</td>
</tr>
<tr>
<td>6. Other infections</td>
<td>3,773</td>
<td>4.41%</td>
</tr>
<tr>
<td>7. Occupational Asthma</td>
<td>3,662</td>
<td>4.27%</td>
</tr>
<tr>
<td>8. Heat stroke, cramps, exhaustion</td>
<td>1,044</td>
<td>1.22%</td>
</tr>
<tr>
<td>9. Other diseases</td>
<td>952</td>
<td>1.11%</td>
</tr>
<tr>
<td>10. Deafness</td>
<td>868</td>
<td>1.02%</td>
</tr>
<tr>
<td>11. Cataract</td>
<td>314</td>
<td>0.37%</td>
</tr>
<tr>
<td>12. Frostbite, freezing</td>
<td>99</td>
<td>0.12%</td>
</tr>
<tr>
<td>13. Acute poisonings</td>
<td>91</td>
<td>0.11%</td>
</tr>
</tbody>
</table>

Source of data: 2011/2012 BLES Integrated Survey (BITS)
Definition of Terms

HAZARD

- source, situation, or act with a potential harm in terms of human injury or ill health, or a combination of these
- anything with the potential to cause bodily injury, and includes any physical, chemical, biological, ergonomic and safety hazards

HAZARD IDENTIFICATION – process of recognizing that hazard exists and defining its characteristics
**Definition of Terms**

**BIOHAZARD**
- refer to **biological substances** that pose a threat to the health of living organisms, primarily that of humans.
- include medical waste or samples of a microorganism, virus or toxin (from a biological source) that can affect human health.

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**Definition of Terms**

**RISK**
- situation involving exposure to danger (hazard)
- Likelihood that a hazard will cause a specific injury (ill-health) to any person

Hazard + Exposure = HEALTH RISK
No Hazard + No Exposure = NO HEALTH RISK
With Hazard + No Exposure = NO HEALTH RISK
Classification of Microbes by Risk

<table>
<thead>
<tr>
<th>Risk Group Classification</th>
<th>NIH</th>
<th>WHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Group 1</td>
<td>Not associated with disease in healthy adult humans</td>
<td>No or low individual &amp; community risk</td>
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<td>Risk Group 2</td>
<td>Associated with human disease, rarely serious, prevention methods &amp; treatments often available</td>
<td>Moderate individual risk, low community risk</td>
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<td>Risk Group 3</td>
<td>Associated with serious or lethal human disease, prevention methods &amp; treatments may be available</td>
<td>High individual risk, low community risk</td>
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<td>Risk Group 4</td>
<td>Likely to cause serious or lethal human disease, prevention methods &amp; treatments not usually available</td>
<td>High individual &amp; community risk</td>
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Modified from BMBL 5th ed. Table 1 – Classification of Infectious Microorganisms by Risk Group

Definition of Terms

**BIOSAFETY**

- Bio = life; Safety = free from harm or danger
- The application of a combination of administrative controls, containment principles, laboratory practices and procedures, safety equipment, and laboratory facilities to enable laboratory staff to work safely with potential infectious microorganisms.  - Center for Disease Control (CDC)
**Laboratory Biosafety**

WHO describes this as:
- containment principles
- technologies
- practices
- implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release

---

**Principles of Laboratory Biosafety**

To protect:
- yourself (lab. worker)
- other persons outside the laboratory
- the environment
Administrative Controls

- Supervision by an experienced scientist/laboratory supervisor
- All personnel are well trained, proficient, aware of hazards, follow rules
- Routine medical surveillance
- Biosafety and operations manuals
- Emergency plans for spills, accidents, etc.
- Appropriate facilities and safety equipment
**Good Laboratory Practices**

- Restrict or limit access when working
- Biohazard warning signs
- Prohibit eating, drinking and smoking
- Prohibit mouth pipetting
- Minimize splashes and aerosols
- Decontaminate work surfaces daily
- Decontaminate wastes

---

**Containment**

- *Conditions under which infectious agents can be safely manipulated.*

1. **Primary containment**: protect worker and immediate laboratory environment
   - Good microbiologic techniques
   - Safety equipment

2. **Secondary Containment**: protect the environment outside the laboratory
   - Facility design
   - Waste management
**Biosafety Level (BSL)**

- Condition under which an infectious agent can ordinarily be safely handled
- Conditions are a combination of:
  - Laboratory practices and techniques
  - Safety equipment
  - Laboratory facilities
- Usually agent and procedure specific
  
  Refer to the reference: Summary of Recommended Biosafety Level for infectious agents

---

**Process of Protecting Worker’s (Laboratory Staff) Health**

- Hazard Identification
- Risk Assessment
- Management intervention
- Control Procedures
- Monitoring & Evaluation of programs
**Biosafety Level 2 (BSL 2)**

Suitable for working involving agents of moderate potential hazard to personnel and the environment

- Mycobacterium species other than members of M. tuberculosis complex
- Non-aerosol generating manipulations of clinical specimens from TB patients
- BSC is to be used for aerosol generating procedures

**Biosafety Level 3 (BSL 3)**

Suitable for work with infectious agents which may cause serious or potentially lethal disease as a result of exposure by the inhalation route.

- members of M. tuberculosis complex
Classification of TB Laboratories

3 main levels of procedural risk, based on the activities being performed and their associated risks:
- low TB risk;
- moderate TB risk;
- high TB risk (such as a TB containment laboratory).

BSL 2: Low-risk TB Laboratories

Direct AFB Smear Microscopy
Xpert MTB/RIF Assay

Limited risk of generating infectious aerosols
- Work can be done on an open bench
  • Restricted access to the laboratory
  • Separate bench for smear preparation
- Adequate ventilated laboratory
  • 6-12 ACH, directional airflow
  • Natural or mechanical ventilation
- Proper disposal of infectious materials
**Low-risk TB Laboratories**

Limited risk of generating infectious aerosols  
(*Direct AFB Smear Microscopy & Xpert MTB/RIF Assay*)

- Work can be done on an open bench
  - Restricted access to the laboratory
  - Separate bench for smear preparation
- Adequate ventilated laboratory
  - 6-12 ACH, directional airflow
  - Natural or mechanical ventilation
- Appropriate PPE
- Proper disposal of infectious materials

---

**Medium-risk TB Laboratories**

Risk of generating infectious aerosols during centrifugation and specimen manipulation  
(*Smear, TB Culture, Molecular Test*)

- Laboratories must have restricted access and be separated from public areas
- Impermeable surfaces for easy cleaning
- Airflows into laboratory without re-circulation to non-lab areas (directional airflow)
  - 6-12 ACH, passive or mechanical ventilation
  - Closed windows
- Proper disposal of infectious materials
Medium-risk TB Laboratories (2)

- Class I or II Biosafety Cabinet used for all open manipulation of agents
  - BSC must be properly installed and certified at least annually
  - BSC exhaust may be
    - Ducted to outside using a hard duct or thimble fitting
    - Re-circulated into the room if assured that the BSC is functioning properly
- Use aerosol-containment centrifuge rotors

High-risk TB Laboratories (1)

High risk of generating infectious aerosols during manipulation of liquid suspension
(Smear, Subculture, DST, Molecular Test)

- Work in a containment lab which has restricted access and a double door entry
- Impermeable surfaces for easy cleaning
  - Room penetrations sealed to enable fumigation
- Airflows into laboratory without re-circulation to non-lab areas (directional airflow)
  - 6-12 ACH, mechanical ventilation, sealed windows
High-risk TB Laboratories (2)

- Autoclave available in the site
- Class I or II Biosafety Cabinet used for all open manipulation of agents
  - BSC must be properly installed and certified at least annually
  - BSC exhaust may be
    - Ducted to outside using a hard duct or thimble fitting
    - Re-circulated into the room if assured that the BSC is functioning properly

High-risk TB Laboratories (3)

- Respiratory protection as needed
  - N95 respirator or equivalent
  - Powdered Air-purifying Respirator (PARR)
- Use aerosol-containment centrifuge rotors
- Decontaminates spills promptly
**Are all of the requirements for a BSL-3 Laboratory necessary?**

If a facility does not have all required BSL3 features (e.g. sealed penetrations, solid ceiling), an acceptable level of safety for conducting routine procedures, including culture, may be achieved in a BSL2 facility providing:

- Directional inward airflow is maintained and exhaust air is discharged to the outside
- Access to the laboratory is restricted when work is being performed
- The recommendations for BSL3 practices, procedures, and safety equipment are rigorously followed

---

**TAKE HOME MESSAGE**

- The risk of acquiring TB infection by the TB laboratory workers is higher than that of other laboratory workers.
- The three inter-related levels of biosafety are:
  - Good laboratory practice
  - Safety equipment
  - Facility design and lay-out
- Proper identification of hazards and the risks that exist in the laboratory is important to effectively assign and implement the biosafety control measures.
**TAKE HOME MESSAGE**

- The 3 main levels of procedural risk, based on the activities being performed in and their associated risks:
  - Low-risk TB laboratories
  - Medium-risk TB laboratories
  - High-risk TB laboratories
- Each class of TB laboratories require different control measures to ensure safety of the laboratory workers, the specimens and the environment.

**References**

- Biosafety in the Mycobacteriology Laboratory – Stop TB Partnership
- Biosafety recommendations for TB diagnostic – Stop TB Partnership
  [www.stoptb.org/wg/qli/assets/documents/BiosafetyGuidanceefactsheet.pdf](http://www.stoptb.org/wg/qli/assets/documents/BiosafetyGuidanceefactsheet.pdf)
References

- National Tuberculosis Laboratory Biosafety Manual. June 2012. Department of Heath, Research Institute for Tropical Medicine, National Tuberculosis Reference Laboratory.
SESSION 2B: PRINCIPLES AND PRACTICES IN LABORATORY WASTE MANAGEMENT

This session describes the processes and steps in managing waste materials generated in the TB laboratory, from safe handling to disposal.

Objectives

At the end of the session the participants will be able to enumerate the principles of waste management in the TB laboratory.

Methods

Lecture, discussion, home reading

Materials

Handouts

Session activity

Discussion of principles in laboratory waste management

Competency

Understand the principles of waste management in the TB laboratory

Duration: 30 minutes
Training of Trainers
Basic TB Microscopy Training Course
Cebu TB Reference Laboratory, Cebu City
July 25-29, 2015

Session 2
Health Care Waste Management
Principles and Practice

Authors: Arthur B. Lagos MD, Lynette P. Adorio-Arce MD
Management Sciences for Health

What is the session all about?

- In this session, we will look at the principles that form the bases for health care waste management

- Session objectives
  1. Enumerate the principles of laboratory waste management
Introduction

- Health-care activities lead to the production of waste that can result to adverse health effects.

- Most health care waste are not more dangerous than regular household waste.

- Some health-care wastes represent a higher risk to health especially infectious wastes which make up from 15% to 25% of total health-care waste.

Health risks of health care waste materials (1/2)

- Health-care waste contains potentially harmful microorganisms which can infect patients, health workers and the general public.

- Other potential infectious risks may include the spread of drug-resistant microorganisms from health facilities into the environment.
Health risks of health care waste materials (2/2)

- Other health risks:
  1. Radiation burns;
  2. Sharps-inflicted injuries;
  3. Poisoning and pollution from pharmaceutical products such as antibiotics and cytotoxic drugs;
  4. Poisoning and pollution through waste water and through toxic elements (e.g. mercury or dioxins) that are released during incineration.

Types of health care waste and examples (1)

1. *Infectious waste*: waste contaminated with blood and other bodily fluids, cultures and stocks of infectious agents from labs, wastes from patients and equipment (e.g. swabs, bandages and disposable medical devices);

2. *Pathological waste*: human tissues, organs, fluids, body parts and contaminated animal carcasses;

3. *Sharps*: syringes, needles, disposable scalpels and blades, etc.;

4. *Chemicals*: solvents for laboratory preparations, disinfectants, and heavy metals in medical devices (e.g. mercury in broken thermometers) and batteries;
Types of health care waste and examples (2)

5. *Pharmaceuticals*: expired, unused and contaminated drugs and vaccines;

6. *Genotoxic waste*: highly hazardous, mutagenic, teratogenic or carcinogenic, such as cytotoxic drugs used in cancer treatment and their metabolites;

7. *Radioactive waste*: products contaminated by radionuclides including radioactive diagnostic material or radio-therapeutic materials;

8. *Non-hazardous or general waste*: does not pose any particular biological, chemical, radioactive or physical hazard.

Sources of health care waste

- **Major sources of health-care waste:**
  1. Hospitals and other health facilities
  2. Laboratories and research centers
  3. Mortuary and autopsy centers
  4. Animal research and testing laboratories
  5. Blood banks and collection services
  6. Nursing homes for the elderly
The way forward

- The management of health-care waste requires attention and diligence to avoid the substantial disease burden associated with poor practice, including exposure to infectious agents and toxic substances.

Key elements in health-care waste management

- Build a comprehensive system that addresses responsibilities, resource allocation, handling and disposal.

- Raise awareness regarding risks of health-care waste and of safe practices;

- Select safe and environment-friendly management options to protect people from hazards when collecting, handling, storing, transporting, treating or disposing of waste.

- Government commitment and support at national and local level is needed for universal and long-term improvement.
SESSION 2B. WORKSHEET ON LABORATORY WASTE MANAGEMENT

Enhanced TOT on Basic TB Microscopy Course

Name of trainee: ____________________  Roster number: ____________________
Position and area of assignment: __________________________________________

Activity: Describe the waste management practices in your laboratory network per type of laboratory procedure.
SESSION 2C. PRINCIPLES AND PRACTICES OF QUALITY ASSURANCE

This session revisits the elements and procedures of quality assurance for TB microscopy. It provides insight regarding the problems in the implementation of the external quality assessment (EQA) program.

Objectives

At the end of the session the participants will be able to:

1. Enumerate the principles of quality assurance in the TB laboratory
2. Enumerate the practices of quality assurance in the TB laboratory

Methods

Lecture, discussion, home reading

Session activities

Presentation and discussion of principles and practices in laboratory quality assurance

Materials

Presentation, handouts

Competencies

1. Understand the principles of quality assurance in the TB laboratory
2. Understand the practices of quality assurance in the TB laboratory
Principles and Practices of Quality Assurance

JOSELITO L. CUA, RMT, MPA
National Senior NTP Laboratory Trainer

Objectives

1. Enumerate correctly the different principles of Quality Assurance in the TB Microscopy laboratory.

2. Enumerate correctly the different practices of quality assurance in the TB Microscopy laboratory.
Why Quality Assurance?

I. What is Quality Assurance (QA)?

Quality Assurance (QA) is a system designed to improve the reliability and efficiency of laboratory services.
Quality Assurance System

External Quality Assessment
- Blind Re-checking
- On-site Evaluation
- Panel Testing

Analysis of results
- Interpretation of Error

Feed-back and Corrective Action
- Quality Improvement

Laboratory Service
- AFB Microscopy

Quality Control

- A systematic internal monitoring of work practices, technical procedures, equipment, and materials including quality of stains.

- Elements of QC
  - Administration (workplace, staffing, SOP, Lab register, data collection, equipment and lab safety)
  - Specimen Submission (collection, transport and handling)
  - Microscopy (smear prep., staining, reporting)
Quality Control of AFB Stains

- Good quality solutions and staining technique make reading and reporting easier and more reliable.

- Purpose: to ensure that the solutions work well and that they are not contaminated with AFB.

- Accurate record keeping of preparation and testing provides confidence in your results.

External Quality Assessment

- A process to assess lab’s capabilities and performances by comparing their results with other labs in the network

- Focuses on the identification of laboratories where there may be serious problems resulting in poor performance.
Process of External Quality Assessment

- Process of EQA includes
  1. Sample slide collection using LQAS
  2. Blinded rechecking
  3. Analysis and interpretation of rechecking results
  4. Feedback
  5. On-site evaluation of laboratories

Quality Improvement

- A process by which the components of smear microscopy services are analyzed
- Aim is to identify and permanently correct any deficiencies
- Involves data collection, data analysis, and creative problem solving.
- Process of QI
  - Data collection and analysis
  - Review of QC results
  - Feedback from on-site evaluation
## System and Procedures

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsible Role</th>
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<tbody>
<tr>
<td>Slide Storage</td>
<td>Microscopist</td>
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<td>Collection of Valid Slide Sample</td>
<td>Provincial/ City Coordinator</td>
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<tr>
<td>Blinded Rechecking</td>
<td>Controller</td>
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<tr>
<td>Analysis and Interpretation</td>
<td>Provincial/ City Coordinator</td>
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<td>On-site Evaluation</td>
<td>Provincial/ City Coordinator</td>
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<tr>
<td>Follow-up</td>
<td>Provincial/ City Coordinator</td>
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</table>

“Quality laboratory services depend on the proper implementation of quality assurance system!”
SESSION 3. STANDARDIZED ASSESSMENT OF STAINED SMEARS

This session provides participants with the steps involved in training on smear preparation using the appropriate forms and provides guidance on providing effective feedback.

Objectives

At the end of the session, the participants will be able to:

1. Demonstrate the standardized assessment of stained smears
2. Demonstrate the use of forms 1, 2, and 3 in the assessment of individual trainees on smear preparation
3. Demonstrate how to give effective feedback

Methods

Discussion, lecture, and exercise

Session content (activities)

1. Plenary discussion: Review of standard smear assessment points
   a. Smear checkpoints template, with corresponding unacceptable smear quality results, will be posted on the wall
   b. Using idea cards, each participant will write down the causes and corrective measures for each of the identified smear problems.

2. Exercise 1: Small group exercise session on smear assessment; introduction and filling out form 1 using 4 sets of 10 panel slides per participant/10 standard smears–75 minutes
   a. The trainer will introduce form 1 to be used in this activity
   b. Each participant assesses 10 slides while filling out form – 1 to 15 minutes
   c. Trainer discusses individual assessment results compared to the 10 standard slides–30 minutes
   d. Plenary session–30 minutes

3. Presentation: Conduct of smear preparation session: 15 minutes

4. Presentation: Introduction and use of forms: 20 minutes
   a. Exercise 2: Transfer data from form 1 worksheet to a blank form 1–1 to 5 minutes
   b. Exercise 3: Introduce form 2–10 minutes
      — Each participant transfers answers from form 1 to form 2
   c. Exercise 4: Introduce form 3–5 minutes
      — Each participant transfers answers from form 2 to form 3

5. Exercise 5: Participants’ demonstrate use of forms 1, 2, and 3 and discuss findings and recommended actions–1 hour
Output

1. Correctly filled out forms 1, 2, and 3, including findings and recommendations for each participant
2. Results of assessment done by participants vs standard assessment results—technical evaluation

Competencies

1. Perform standardized assessment of smear quality
2. Filling up forms 1, 2, and 3 correctly
3. Good understanding of the issues that affect smear quality and able to deliver effective feedback to participants

Duration: 4 hours
SESSION 3. ANSWER KEY FOR STANDARDIZED ASSESSMENT OF STAINED SMEARS

Note: The answer key below is specific for the set of slides used during this particular training.

<table>
<thead>
<tr>
<th>Specimen quality</th>
<th>Staining</th>
<th>Cleanness</th>
<th>Thickness</th>
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## SESSION 3. ASSESSMENT RUBRIC FOR EXERCISE ON FEEDBACK

### Enhanced TOT on Basic TB Microscopy

Name of trainee: __________________________  Roster number: __________________________
Position and area of assignment: __________________________

<table>
<thead>
<tr>
<th>Indicators for effective feedback</th>
<th>Weight</th>
<th>Actual rating</th>
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<tbody>
<tr>
<td>Correct assessment of slides</td>
<td>30%</td>
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<tr>
<td>• 1-3 of 10 slides = 10%</td>
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<td>• 4-6 of 10 slides = 20%</td>
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<td>• 7-10 of 10 slides = 30%</td>
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<td>Correct use of forms 1, 2, and 3</td>
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<td>• 1 of 3 forms = 7%</td>
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<td>• 2 of 3 forms = 14%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Recommendations are correct</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>• 1 of 6 assessment areas = 7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 2 of 6 assessment areas = 14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 3 of 6 assessment areas = 21%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 4 of 6 assessment areas = 28%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 5 of 6 assessment areas = 35%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• All 6 areas = 40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messages communicated effectively</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>• Not effective = 5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Somewhat effective = 7.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Effective = 10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Senior trainer: __________________________________________
## SESSION 3: EVALUATION SHEET FOR EXERCISE ON FEEDBACK

### Enhanced TOT on Basic TB Microscopy Course

Name of trainee: ____________________  Roster number: ____________________  
Position and area of assignment: __________________________________________

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Passing rate</th>
<th>Actual rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performance of standardized assessment (at least 90%)</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>2. Correct filling out of forms 1, 2, and 3 (at least 90%)</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>3. Able to deliver effective feedback (at least 90%)</td>
<td>90%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-indicators</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct assessment of slides</td>
<td>30%</td>
</tr>
<tr>
<td>Correct use of forms 1, 2, and 3</td>
<td>20%</td>
</tr>
<tr>
<td>Recommendations are correct</td>
<td>40%</td>
</tr>
<tr>
<td>Messages communicated effectively</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Senior trainer: _____________________________________________________________________
SESSION 4. MICROSCOPY READING

This session provides a review of the process of slide reading assessment used in microscopy training, including the use of the proper forms, providing feedback, and preparing standardized training slides.

Objectives

At the end of the session, the participants will be able to:

1. Interpret in a standard manner the National AFB Reporting Scale
2. Demonstrate and explain training steps with the use of appropriate forms
3. Assess reading performance and identify weaknesses using indicators
4. Demonstrate how to provide feedback
5. Correctly prepare a standard set of slides for microscopy reading

Methods

Lecture, practice, discussion, demonstration, group sessions

Session activities

1. Discussion of standard reporting scale–15 minutes

2. Exercise 1: Practice reading of 10 standard slides; comparison of reading results with standard reader results–1 hour 15 minutes (practice)
   a. Each participant will be given 5 minutes to read each slide and write their answers on the answer sheet (form A) provided
   b. Participants will move to the next microscope when the buzzer sounds
   c. Trainers will collect the answer sheets after the participants have read the 10 slides
   d. Trainers will check the answers vs the standard reading key; use form A to fill out the correlation table
   e. Plenary discussion of exercise results–30 minutes
      Product: At least 90% reading agreement rate

3. Presentation and demonstration on how to conduct training on microscopy reading and filling out forms A, B, C, and D–30 minutes; includes:
   a. Preparation of standard training slides
   b. Conduct training on microscopy reading
   c. Use of appropriate forms

4. Exercise 2: Arranging coded slides; participants will
   a. Be given a panel of 10 coded slides and the random number table
   b. Transfer slides from practice 1 to practice 2
c. Check the slide arrangement before proceeding to practice 2
d. Practice transferring and arranging the slides until practice 4
   Product: Correctly arranged coded slides for each microscopy reading practice

5. Exercise 3: Analysis of practice reading results and filling out form C–30 minutes
   a. Each participant will be given a set of results (form A) from one participant as an example
   b. Using the random numbers table from exercise 2, they will fill out the correlation table of forms A and C
   c. Participants will provide their analysis of the participant’s performance
   d. Product: Properly filled out form C with correct analysis

Competencies

1. Correctly filling out microscopy forms with a score of at least 90%
2. Achieve at least 90% agreement with no major errors
3. Discuss microscopy results and provide feedback effectively
4. Able to prepare a set of standard slides (this will be assessed in the future when the trainee will conduct the Basic TB Microscopy Course for microscopists)

Duration: 6 hours
SESSION 4. ASSESSMENT RUBRIC FOR EXERCISE ON MICROSCOPY READING

Name of trainee: ___________________ Roster number: ___________________ 

Position and area of assignment: ___________________ 

Competency:

1. Correctly filling out microscopy forms with a score of at least 90%
2. Achieve at least 90% agreement with no major errors
3. Discuss microscopy results and provide feedback effectively
4. Able to prepare a set of standard slides (this will be assessed in the future when the trainee will conduct BTMC for microscopists)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Passing rate</th>
<th>Actual rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performance of standardized microscopy reading (at least 90%)</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>2. Correct filling out of forms A, B, and C (at least 90%)</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>3. Able to deliver effective feedback (at least 90%)*</td>
<td>90%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-indicators</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microscopy readings are correct</td>
<td>30%</td>
</tr>
<tr>
<td>Correct use of Forms A, B and C</td>
<td>20%</td>
</tr>
<tr>
<td>Recommendations are correct</td>
<td>40%</td>
</tr>
<tr>
<td>Messages communicated effectively</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Use sub-indicators a,b,c, and d to compute indicator 3 (able to deliver feedback)
Session 4: Microscopy Reading

SESSION OBJECTIVE

- To interpret in standardized manner the National AFB Reporting Scale
- Demonstrate and explain training steps with the use of appropriate forms
- Assess reading performance and identify weaknesses using indicators
- Demonstrate method of providing correct feedback
- Correctly prepare standard set of slides for microscopy reading
### PHILIPPINE NATIONAL STANDARD

**AFB REPORTING SCALE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>+ n</td>
<td></td>
</tr>
<tr>
<td>1+</td>
<td></td>
</tr>
<tr>
<td>2+</td>
<td></td>
</tr>
<tr>
<td>3+</td>
<td></td>
</tr>
</tbody>
</table>

**End of presentation 1**
### PHILIPPINE NATIONAL STANDARD ON AFB REPORTING SCALE

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No AFB seen in 300 OIF</td>
</tr>
</tbody>
</table>
| + n   | 1 – 9 AFB /100 OIF  
*Write actual no. of AFB seen (e.g. +1, +2, +3 etc.)* |
| 1+    | 10 – 99 AFB /100 OIF |
| 2+    | 1 – 10 AFB /OIF in at least 50 fields |
| 3+    | More than 10 AFB /OIF (Oil Immersion Field) in at least 20 fields |

### Exercise 1: Slide Reading Practice

10 slides x 5 mins./trainee – <1 hour
2. How to conduct training on Microscopy Reading

Flow Chart on Microscopy Reading Practice

I. Preparation of Panel Standard Slides
   <Trainer>
   
II. Reading of Slides
   <Trainee>
   
III. Analysis of Results
   <Trainer>

   Form A, B, C, D
   
IV. Feedback
   <Trainer>

   Rearrange slides by code numbers table
I. PREPARATION OF PANEL STANDARD SLIDES

1. A panel standard slides consist of 10 slides.
2. The components of 1 panel are:
   a) 5 negative slides
   b) 2 scanty positive slides (+n)
   c) 1 moderately positive slide (1+)
   d) 2 heavy positive slides: 1 slide (2+); 1 slide (3+)
3. Engrave each slide with a unique number (see table on next slide).

Code Numbers Table

<table>
<thead>
<tr>
<th>Slide Code No.</th>
<th>Standard Reading Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>+1-9</td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1+</td>
</tr>
<tr>
<td>9</td>
<td>2+</td>
</tr>
<tr>
<td>10</td>
<td>3+</td>
</tr>
</tbody>
</table>
Session 4: Microscopy Reading

PREPARATION OF SMEAR NEGATIVE AND POSITIVE STANDARD SLIDES

- Prepare a **negative slide group** from any muco-purulent quality specimen and stained with 0.1% Methylene Blue, the counterstain of Zeihl-Neelsen method. Re-reading of the slide during the practice will not be considered.

- Obtain a **positive slide group** from routine laboratory microscopy specimens. Select slides specimen from a new case patient and which have the same **AFB grading scale** of 2 or 3 readings for **standard positive results**.

---

Session 4: Microscopy Reading

Evaluation and Feedback Forms for Microscopy Reading

<table>
<thead>
<tr>
<th>Form A (Trainee)</th>
<th>Form B (Trainee)</th>
<th>Form C (Trainee)</th>
<th>Form D (Trainee)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Worksheet for Microscopy</td>
<td>• Worksheet for Microscopy for Consolidation of Results</td>
<td>• Feedback Sheet by Correlation Table</td>
<td>• Feedback Sheet by Scoring System</td>
</tr>
</tbody>
</table>
Form A – Worksheet for Microscopy
- Form use for trainee to enter reading result
- All filled up Form A from practice 1 to 3 will be compiled for the technical evaluation on slide reading practice

Form B – Worksheet for Microscopy for Consolidation of Results
- Form use for trainer to consolidate results as a summary for the three practices
- Trend and the level of performance at each reading practice session will be observed.
- Utilized for the arrangement of the slide code numbers from practice 1, 2 and 3
Session 4: Microscopy Reading

- **Form C** – Feedback Sheet by Correlation Table
  - Form use for trainer to compare results between trainee with the standard using Correlation Table and
  - To further enhance their skills for quality improvement.
  - Form use for trainer to determine the skills in reading slides that the level of agreement and disagreement will be identified in terms of major error and minor errors.

---

**Form D** – Feedback Sheet by Scoring System

- Data entered in this form are based on Form C.
- A passing score is 90 or more points.
- This determines the skills in reading slides
- Final judgement will be pass or fail.
II. READING OF SLIDES

<Trainee>

1) Provide each trainee with **10 standard slides** to read using the standard scanning and the AFB reporting scale and to use **Form A** to enter reading results.

2) Repeat the procedure in different sessions with the slide no. changed according to **Coded Nos. Table** or **Form B**

3) Collect, analyze results and compile all Form A with results.

CONDUCT OF SLIDE READING PRACTICE SESSION

- Trainees will be given a panel for 3 different sessions, where the order of the numbered slides is re-arranged using the **code numbers table**.

- Conduct **at least 3 sessions** to accurately assess the progress on the skills in reading.

- Feedback will be given specifically the weak and strong points on technical aspects that were observed on the initial phase of practice to improve the level of performance and to obtain a reliable and accurate results in the laboratory diagnosis.
For Practice #1 on Slide Reading:

1. Provide each trainee with a set of **10 panel test standard slides** for reading practice, spend 5 mins. per slide.

2. Arrange the slides for Practice 1, 2 & 3 using the Code Number's Table or Form B.

For Practice #1 on Slide Reading:

1. Instruct to fill up Form A - Worksheet for Microscopy with the following:
   - name
   - date
   - box no.
   - no. of practice

2. Reading result of the slide will be entered on "Your result column" and

3. Use red pen for positive results.
### Session 4: Microscopy Reading

#### Arrangement of Slides for Practice #1 on Slide Reading

1. Utilize Form B as the Code Number’s Table. Slide Code No. 1 to 5 with a negative (0) result will be positioned at the Mappe #5, 9, 10, 6 and 7.
2. Slide code #6 and 7 with scanty (+) result positioned at Mappe #2 & 8.
3. Slide code #8 will be positioned at Mappe #3.
4. Slide code #9 will be positioned at Mappe #4.
5. Slide code #10 will be positioned at mappe#1.
6. Label the slides with water resistant adhesive tape on one end of the slide.

<table>
<thead>
<tr>
<th>Slide code no.</th>
<th>Standard Reading Result</th>
<th>1st Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>+1-9</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>1+</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>2+</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>3+</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Arrangement of Slide No. for Practice #2 on Slide Reading:

1. Column 1 on Form B, Slide Code #1 to 5 with a negative (0) result will be positioned at the Mappe #5, 9, 10, 6 and 7 for Practice #1 will be transferred to Mappe #2, 3, 7, 9 & 4 for Practice 2.
2. Slide code #6 and 7 with scanty (+) result that positioned on P1 in Mappe #2 & 8 will be transfer at Mappe #5 & 8.
3. Slide code #8 at Mappe #3 will be transfer to Mappe #1.
4. Slide code #9 at Mappe #4 will be transfer to Mappe #6.
5. Slide code #10 will be at mappe#1 will be transfer to Mappe #10. Then, label the slides with water resistant adhesive tape on one end of the slide.

<table>
<thead>
<tr>
<th>Slide code no.</th>
<th>Standard Reading Result</th>
<th>1st Practice</th>
<th>2nd Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>+1-9</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>8</td>
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</tr>
<tr>
<td>8</td>
<td>1+</td>
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<td>9</td>
<td>2+</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>3+</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>
Session 4: Microscopy Reading

**Arrangement of Slide No. for Practice #3 on Slide Reading:**

1. On the 1st Column, Transfer Slide Code #1 to #5 with a negative (0) result that positioned at the Mappe #2, 3, 7, 9, and 4 on Practice 2 will be placed to Mappe #1, 3, 4, 9, and 2 for Practice 3.
2. Slide code #6 and 7 with scanty (+) positioned at Mappe #5 and 8 will be placed at Mappe #10 & 7.
3. Slide code #8 that positioned on Mappe #1 will be placed to Mappe #5.
4. Slide code #9 that positioned on Mappe #6 will be placed to Mappe #8.
5. Slide code #10 that positioned on Mappe #10 will be placed to Mappe #6.
6. Then, label the slides with water resistant adhesive tape on one end of the slide.

<table>
<thead>
<tr>
<th>Slide code no.</th>
<th>Standard Reading Result</th>
<th>1st Practice</th>
<th>2nd Practice</th>
<th>3rd Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>9</td>
<td>3</td>
<td>3</td>
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<tr>
<td>3</td>
<td>0</td>
<td>10</td>
<td>7</td>
<td>4</td>
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<td>4</td>
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<td>5</td>
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<td>6</td>
<td>+1-9</td>
<td>2</td>
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<tr>
<td>8</td>
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<tr>
<td>9</td>
<td>2+</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>3+</td>
<td>1</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

**THINGS TO DO AFTER SLIDE READING PRACTICE**

- Collect Form A with results and the standard slides from participant
- Slides will be dipped into the jar containing xylene to remove oil and remove the tape
- Analyze the results using the Correlation Table on Form A and transfer data to Form C – Feedback Sheet by Correlation Table
- Compile all result on slide reading practices
- Utilize Form C to give feedback to the participant’s results that are found in practice #1 specifically the major errors to reduce and eventually eliminate, any high false reading results prior to practice 2.
III. ANALYSIS OF RESULTS BETWEEN STANDARD AND TRAINEE <Trainer>

1) Enter all results from Form A – Worksheet for Microscopy into Form B – Worksheet for Microscopy for consolidation of reading results.

2) Compare results obtained by trainee with standard results using Correlation Table in Form C. Observe type of errors (major / minor error).

3) Determine and indicate the total no. of errors by each type and get the agreement of total correct results per practice using Form D by Scoring System. Form D is used to determine the skills in reading proficiency whether the trainee is Pass or Fail. A passing score is 90 or more points. This form is utilize for Feedback in Microscopy Reading.

ANALYSIS AND INTERPRETATION OF RESULTS
Based on the Classification of Errors

### Major Error
(disagreement > 1 level)

- High False Positive (HFP)
- High False Negative (HFN)
- Quantification Error (QE)

### Minor Error
(disagreement by 1 level)

- Low False Positive (LFP)
- Low False Negative (LFN)
- Quantification Error (QE)
**INTERPRETATION OF ERRORS**

- Use classification as indicated in the National Quality Assurance Manual (pink color).

- The most important task is for the **trainee** to read **negative slides** as "negative" and **positive slides** as "positive".

- The goal of training should be to reduce and eventually eliminate, any high false positive and high false negative results.

- Minor errors are considered less serious, however, frequency must be observed as they may indicate technical deficiencies.

---

**EQUIVALENT SCORES ON TYPE OF ERROR**

<table>
<thead>
<tr>
<th>Type of Error</th>
<th>Equivalent Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct (including the numbers within the bold line):</td>
<td>10</td>
</tr>
<tr>
<td>QE Quantification error (Minor error):</td>
<td>5</td>
</tr>
<tr>
<td>LFP Low False Positive (Minor error):</td>
<td>0</td>
</tr>
<tr>
<td>LFN Low False Negative (Minor error):</td>
<td>0</td>
</tr>
<tr>
<td>HFP High False Positive (Major error):</td>
<td>0</td>
</tr>
<tr>
<td>HPN High False Negative (Major error):</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result by Controller/Standard Result</th>
<th>0</th>
<th>1-9 AFB/100vf</th>
<th>1+</th>
<th>2+</th>
<th>3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result by Microscopist/Trainee</td>
<td></td>
<td>LFP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFN</td>
<td></td>
<td>Correct</td>
<td></td>
<td></td>
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<tr>
<td>QE</td>
<td></td>
<td>Correct</td>
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</tr>
<tr>
<td>HFN</td>
<td></td>
<td>Correct</td>
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</tr>
<tr>
<td>QE</td>
<td></td>
<td>Correct</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Session 4. Microscopy Reading

1. Enter all results from Form A into Form B. This will guide the trainer to identify the type of major and minor errors that occur. Observe the level of performance at each reading practice session.

   **FORM A**
   
   **FORM B**

2. Compare results between trainee with the standard using Correlation Table. A feedback will be given to trainee after the initial result to further enhance their skills for quality improvement using Form C.
3. Fill up Form D—from the data on Form A to determine the skills in reading proficiency whether trainee is Pass or Fail.

**FORM A**

<table>
<thead>
<tr>
<th>Slide Code No.</th>
<th>Standard Result</th>
<th>Trainer Result</th>
<th>Trainer Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**FORM D**

<table>
<thead>
<tr>
<th>Raw</th>
<th>Type of Error</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>HPP</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>HPN</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Sub-total</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>LFP</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>LFN</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Sub-total</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>QE</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>QE Score (0 x 5)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Correct</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Correct Score (1 x 10)</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Total Score* (100)</td>
<td>55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| L   | Final Judgement | Pass | Fail | Fail | Fai

**Session 4: Microscopy Reading**

**IV. FEEDBACK**

**<trainer>**

**WHAT TO GIVE FEEDBACK?**

IDENTIFY THE TYPE OF ERRORS ON OVER READING

**WHAT TO GIVE FEEDBACK?**

IDENTIFY THE TYPE OF ERRORS ON UNDER READING

**Improvement of the Results**

HOW MANY SLIDE READING RESULTS WITH THE SAME RESULTS BETWEEN STANDARD AND TRAINEE

**WHAT ARE THE CORRECTIVE ACTION TO IMPROVE THE LEVEL OF PERFORMANCE, TO ACHIEVE THE SCORE OF 90 POINTS OR 0% MAJOR ERROR TO HAVE A REASABLE AND ACCURATE RESULTS**
Session 4. Microscopy Reading

**BLIND RECHECKING**

<5% MAJOR ERROR>

**NAME: Z. DOLINO - PRACTICE 1**

<table>
<thead>
<tr>
<th>Over reading:</th>
<th>Result by trainee</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFP=0</td>
<td></td>
</tr>
<tr>
<td>HFP=0</td>
<td></td>
</tr>
<tr>
<td>MajorQE=0</td>
<td></td>
</tr>
<tr>
<td>MinorQE=2</td>
<td></td>
</tr>
<tr>
<td>Under reading:</td>
<td></td>
</tr>
<tr>
<td>LFN=0</td>
<td></td>
</tr>
<tr>
<td>HFN=0</td>
<td></td>
</tr>
<tr>
<td>MajorQE=1</td>
<td></td>
</tr>
<tr>
<td>MinorQE=0</td>
<td></td>
</tr>
<tr>
<td>Agree on the ff:</td>
<td></td>
</tr>
<tr>
<td>0/0, +/+n, 1+/1+, 2+/2+, 3+/3+</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard result</th>
<th>0</th>
<th>1-9 AFB/100f</th>
<th>1+</th>
<th>2+</th>
<th>3+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over reading:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFP=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFP=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MajorQE=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MinorQE=2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under reading:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LFN=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HFN=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MajorQE=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MinorQE=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree on the ff:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0/0, +/+n, 1+/1+, 2+/2+, 3+/3+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SESSION 4: MICROSCOPY READING**

**IV. FEEDBACK**

<trainer>

Possible Causes of False Reading Results
(see guide on Possible Causes and Suggested Actions and influence of Poor Smear Preparation on False reading, EQA manual on page 34 and AFB microscopy Training on page 38)

**EMPHASIZE** the need to be consistent in the use of the reporting scale and make use of Findings and Recommendations to determine the solutions and to improve the performance.

**IMPROVEMENT OF THE RESULTS**

EXPLAIN the single, pairs or v shape and clumping appearance of the AFB and POINT OUT the single, v forms and clumps AFB on the slide under 100x magnification.

**EMPHASIZE** the need to use the iris diaphragm for the color contrast of the AFB and fine adjustment knob of the microscope to detect scanty positive smears.
Exercise #2 – Analysis of Reading Practice Results Between Standard and Trainee for Practice 1, 2, and 3 using the appropriate Forms

and

Exercise #3 – Arranging Coded Slides For Microscopy Reading Practice

End of Presentation!
SESSION 5. TRAINING DATA MANAGEMENT AND REPORT WRITING

This session provides the participants with the knowledge and skills to manage training data and use the information to write reports. The process of writing effective training reports is also discussed.

Objectives

At the end of the session, participants will be able to:

1. Manage training data
   a. Collate training data
   b. Organize training data
   c. Summarize data and present these in meaningful graphical forms

2. Analyze and interpret data on participants’ training performance

3. Write a training report

Method

Lectures, exercises, group case study, report writing

Session activities

1. Lecture on measures of central tendency, tables, charts and graphs – 30 minutes
2. Exercise 1: Case study
3. Activities
   a. Organizing, collating, and summarizing data with meaningful graphical forms – 1 hour
   b. Analyzing and interpreting data on participants’ training performance – 1 ½ hours
   c. Writing a training report – individual assignment

Outputs

1. Collated, organized, and summarized data
2. Correct use of graphical presentations of participants’ training performance
3. Analyzed and correctly interpreted data on participants’ training performance
4. Training report

Competencies

• **Indicator 1: Manages data correctly**
  1. Organizes data correctly 20%
  2. Performs descriptive statistical computations correctly 20%
  3. Constructs tables correctly 25%
  4. Selects appropriate graphical presentation of data and draws graphical presentations correctly (graphs, charts, maps) 35%
• **Indicator 2: All elements of the written report are demonstrated in proper sequence**
  1. Introduction (20%)
  2. Methods (20%)
  3. Results (20%)
  4. Analysis and interpretation (20%)
  5. Conclusions and Recommendations (20%)

**Duration:** 5 hours
### SESSION 5. ASSESSMENT RUBRIC FOR EXERCISE ON TRAINING DATA MANAGEMENT AND REPORT WRITING

Name of trainee: __________________________  Roster number: __________________________
Position and area of assignment: __________________________

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Passing rate</th>
<th>Actual rate</th>
<th>Final rate (total of actual rate for the indicator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Manages data correctly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Organizes data 20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Performs descriptive statistical computations 20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Constructs tables 25%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Selects appropriate graphical presentation of data and draws graphical presentations correctly (graphs, charts, maps) 35%</td>
<td>90%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. All elements of the written report are demonstrated in proper sequence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Introduction (20%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Methods (20%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Results (20%)</td>
<td>90%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Analysis and interpretation (20%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Recommendations (20%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Senior trainer: __________________________

Page | 83
Introduction:

- Need for summarizing accumulated training data
- Using simple statistics in reporting training results
- Show training data using graphical displays
- Analysis of training results
- Searching for the meaning of training data
- Training information as basis for future actions
Outline of Presentation

1. Measures of central tendency and variability/dispersion
2. Ratios, Proportions, Rates
3. Organizing Data using Tables
4. Summarizing and Analyzing Laboratory Training Data
5. Organizing Data using Charts, Maps and Graphs
6. Report Writing

1. Measures of Central Tendency

How similar are the scores of the trainees?

Significance: Summary measures used to describe the most typical value in a set of values

- Mean – arithmetic average
- Median – the median is the point at which exactly half of the data are above and half below. These halves meet at the median position
  - better indicator if a set of scores/values has an outlier or extreme value that differs greatly from other values
- Mode – most common observation

Recitation/Exercise
How to obtain the median

- Arrange the observations in order from smallest to largest value.
- If there is an odd number of observations, the median is the middle value.
- If there is an even number of observations, the median is the average of the two middle values.

- Formula: \( \frac{n+1}{2} \)

2. Measures of Variability or dispersion

How different are the scores of the participants?

Significance: Summary measures used to describe the amount of variability or spread in a set of data

- **Range** – difference between the largest and smallest values in a set of values
- **Interquartile Range (IQR)**
- **Variance** – how far each number is from the mean
- **Standard Deviation** – square root of the variance
**Ratios, Proportions, Rates**

Dr. Lynette P. Adorio-Arce  
Dr. Arthur B. Lagos

July 26, 2016  
CTRL, Cebu City

---

**Ratios, Proportions and Rates**  
(General Formula)

*Formula:*

\[
\frac{x}{y} \times 10^n
\]

*Where:*

\[x \text{ and } y \text{ are quantities being compared}\]
**Ratios**

- Expressions of a relationship between 2 quantities which can be related or totally independent of each other
- Simplest of all statistical measures
- There are no conditions on their use

*Formula:* \( \frac{X}{Y} \)

*Examples:*

\[
\text{female} \quad \frac{\text{male}}{\text{male + female}}
\]

---

**Proportion**

- A ratio in which the numerator is included in the denominator
- Read as percentage

*Formula:*

\[
\frac{X}{Y} \times 100
\]

*Where:*

- \( x \) is a part of \( y \)
Exercise:

A school rule states that the passing grade is at least 75%.

The entrance exam has 100 items. In a group of 12 students, 7 failed the exam. Two barely passed and 3 got a perfect score.

What is the proportion of students who passed?

Answer:

- $N = 12$
- $n = 5 (= 2$ barely passed $+ 3$ perfect score$)$
- Solution:
  - $X = (5 \div 12) \times 100$
  - $X = 0.417 \times 100$
  - $X = 41.7\%$
  - $X = 42\%$
Rate
A proportion which measures the occurrence of an Event in a population over time.

Formula:

\[
\text{Number of occurring events/unit of time}
\]

For example:

Number of trainings per year
Number of microscopists trained per year
Number of new smear positives per month

Organizing Data Using Tables
Dr. Lynette P. Adorio-Arce
Dr. Arthur B. Lagos

July 26, 2016
CTRL, Cebu City
What is a table?

A set of data arranged in rows and columns
Why do we construct tables?

- Organize, summarize and display data clearly and effectively
- Clear presentation of individual numeric values
- Communicate laboratory training and services findings
- Basis for preparing more visual displays of data such as graphs and charts

Why do we construct tables?

- Demonstrates patterns, exceptions, differences, and other relationships (e.g., proportions)
- Provide ease in making comparisons
- Provide ease in analyzing data sets
- Identify, explore, understand and present distributions, trends and relationships in the data
Session 5. Training Data Management and Report Writing

### Parts of a Table

**Table 1. Number of Sputum Positive TB Cases**  
Quezon City, 2011

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4</td>
<td>0</td>
</tr>
<tr>
<td>5 - 14</td>
<td>1</td>
</tr>
<tr>
<td>15 - 24</td>
<td>6</td>
</tr>
<tr>
<td>25 - 44</td>
<td>35</td>
</tr>
<tr>
<td>45 - 64</td>
<td>34</td>
</tr>
<tr>
<td>65 and above</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>86</strong></td>
</tr>
</tbody>
</table>

Source: QCHO

### Proportion

**Table 1. DSSM Training Participants by Profession (N=132)**  
Region ABC  
Jan-Dec 2015

<table>
<thead>
<tr>
<th>DSSM Trainees</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensed Medical Technologist</td>
<td>81</td>
<td>61</td>
</tr>
<tr>
<td>Unlicensed Medical Technologist</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>Nurse</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Others *</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>132</td>
<td>100</td>
</tr>
</tbody>
</table>

*Doctor, Sanitary inspector, Midwife,  
Source: ________ Training Program
Comparison

Table 2. Site of Sputum Examination (N=108)
Province X, February to March, 2013

<table>
<thead>
<tr>
<th>Site</th>
<th>February (N=108)</th>
<th>March (N=85)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>RSS</td>
<td>58</td>
<td>54</td>
</tr>
<tr>
<td>Health Center</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Hospital</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td>108</td>
<td>100</td>
</tr>
</tbody>
</table>

Interval data

Class Intervals

<table>
<thead>
<tr>
<th>Score</th>
<th>No. of Trainees</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1-5</td>
<td>1</td>
</tr>
<tr>
<td>6-10</td>
<td>6</td>
</tr>
<tr>
<td>11-15</td>
<td>3</td>
</tr>
<tr>
<td>16-20</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>
Steps in Creating Class Intervals

1. Find the range \( r \) which is the difference between highest and lowest value.

\[ r = \text{highest value} - \text{lowest value} \]

2. Divide range of values into class intervals.
   a. Choose the class interval size \( i \) (e.g., 2, 5, 10, 25, 50, 100, etc)
   b. Decide on number of class intervals:

   \[
   \text{Number of class intervals} = \frac{r}{i}
   \]

Steps in Creating Class Intervals

3. Choose the Apparent Limits for the highest interval.
   - The ends of a class interval are called class limits, and the middle of an interval is called a class mark.
   - Remember that the lowest interval must contain the lowest score and the highest interval must contain the highest score.

4. Create the apparent limits of the class intervals

Remember that the apparent limits do not have to be equal to the highest or lowest scores.
Summarizing and Analyzing Laboratory Training data

Dr. Lynette P. Adorio-Arce
Dr. Arthur B. Lagos

July 26, 2016
CTRL, Cebu City

Person, Place Time, Laboratory
Factors to Consider in Person Data

- Number of trainers
- Number of trainees
- Profession of trainees
- Functions of trainees
- Training Performance of trainees

Factors to consider in Geographic Data

- Address of trainees (Individual datum)
- Geographic Distribution of Labs
  - Region
  - Province
  - Municipality; City
  - Barangay
- Type of geographic site (GIDA; Disaster)
- Type of laboratory – Facility (RHU; hospital)
- Type of laboratory services – RSS, TMLs; Culture; Gx; LPA; DST
- Legend
Variables to consider in time data

By year
By quarter
By month

Variables to Consider in Laboratory Data

- Type of laboratory services by technology (TML, Gx, Culture, DST, RSS)
- Public or private laboratory
- Facility (RHU, HC, Hospital)
- Location (Region, Province, District, City/Municipality)
**Pie Charts**

**The Basics**
- Show proportions/percentages, especially their comparison, for a total of 100%.
- Display a "whole" with smaller parts and how they relate to each other.
- Good for highlighting the largest or smallest piece of something.

**Do**
- Make sure the largest slice is pointed at 12 o'clock.
- Display slices clockwise in descending order.
- Use short labels and position them horizontally and outside the pie.
- Use pointers if using external labels.
- Use contrasting colors if using internal labels.
- Use distinct contrasting colors or patterns.

**Do not**
- Show more than six slices.
- Use green and red colors side by side.


---

**Vertical Bar Chart**

**Percent**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured</td>
<td>100</td>
</tr>
<tr>
<td>Tx Completed</td>
<td>0</td>
</tr>
<tr>
<td>Died</td>
<td>0</td>
</tr>
<tr>
<td>Failure</td>
<td>0</td>
</tr>
<tr>
<td>Lost to follow-up</td>
<td>0</td>
</tr>
<tr>
<td>Not evaluated</td>
<td>0</td>
</tr>
</tbody>
</table>
**Horizontal Bar Chart**

- **Type of staff**
  - BHWs
  - midwife
  - nurse
  - medtech

**Number trained**

**Vertical Bar Charts or Column Bar Chart**

**The Basics**
- Bars represent a group of data with heights/lengths showing independent categories of data measured in discrete values.
- Axes allow display of two or more individual numeric values.
- Good for displaying magnitude or comparative magnitude between groups of data.
- Can show relative differences or patterns between/across groups.
- Horizontal orientations allow text labels to be placed in an easy-to-read position.
- Vertical orientations are best for showing a comparative rise or fall in counts over levels of one or more variables.

Reference:

**Vertical Bar Charts or Column Bar Chart**

- **Do**
  - Use six or fewer bars per chart
  - Use color/shading with strong contrast
  - Use a line to show a baseline value (Y axis always starts at zero)
  - Use short and easy-to-understand titles, labels, key messages
  - Select beginning and ending values and interval widths for axes that represent patterns in the data without distortion.

- **Do not**
  - Use segmented or stacked bar charts to demonstrate how proportions compare to the whole (1 bar = 1 category only)
  - Use green and red colors side by side

Reference:

---

**Stacked Bar Chart (Intro)**

*Vertical and Horizontal*

![Stacked Bar Chart Example](chart_example.png)

Reference:
USAID SIAPS

---

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Stacked Bar Chart with Grand Total Line

100% Stacked Bar Chart
(Vertical or Horizontal)
Enhanced TB Microscopy Training of Trainers

Stacked Bar Charts

Do
- Bars use data with discrete values
- Use proportions/percentages
- Use color/shading with strong contrast
- Use a line to show a baseline value (Y axis always starts at zero)
- Use short and easy-to-understand titles, labels, key messages

Do not
- Use more than two segments to demonstrate how proportions compare to the whole
- Use green and red colors side by side


Exercise: Which of the charts is easy to read?
Grouped or Cluster Bar Chart

Grouped Bar Charts

The Basics
- Shows comparisons of occurrence through time
- Bars represent a group of data with heights/lengths showing independent categories of data measured in discrete values
- Axes show numeric values
- Time value is plotted on X axis

Reference:
### Grouped Bar Charts

**Number of Sputum Specimens Processed by Laboratory**

- **Do**
  - Use color/shading with strong contrast
  - Use a line to show a baseline value (Y axis always starts at zero)
  - Use short and easy-to-understand titles, labels, key messages

- **Do not**
  - Use more than three bars to demonstrate comparisons
  - Use green and red colors side by side

Reference:

### Line Graph

**Analysis**

- **Count**

Reference:
USAID, SIAPS
**Line Graph**

*Number of Specimens Processed by Laboratory*

- **The Basics**
  - Good for showing a connected sequence of data, such as trends over time
  - Before and after differences
  - If numbers are going up, down, or remaining stable

- **Do**
  - Use arrow or text to highlight key events or data
  - Place labels close to their lines
  - Include baseline data for comparison purposes
  - Use short and easy to understand titles, labels, key messages
  - Select beginning and ending values and interval widths for axes that faithfully and ethically represent patterns in the data without distortion.

- **Do not**
  - Add unnecessary labels or symbols
  - Use more than four trend lines

Reference:

---

**Bar-Line Combination Chart**

- **Attribute 1**
- **Attribute 2**
- **Attribute 3**
- **Attribute 4**
- **Attribute 5**

**Target**
**Actual**

Reference:
USAG, SIAPS
Radar Chart

- A radar chart is a graphical method of displaying multivariate data in the form of a two-dimensional chart of three or more quantitative variables represented on axes starting from the same point.

- The relative position and angle of the axes is typically uninformative.

Also known as:

- web chart
- star chart
- cobweb chart
- polar chart
- spider chart
- star plot
- irregular polygon
- kiviat diagram
Example: Results of Standardized Assessment of Smears
Example: Results of Standardized Assessment of Smears

![Diagram showing the results of standardized assessment of smears, including Specimen Quality, Evenness, Staining, Cleanliness, Size, and Thickness. The diagram also includes a bar chart showing the percent distribution of these parameters.]

USAID SIAPS
**The Basics**

- Help illustrate how frequencies are distributed geographically
- Support interpretive tasks, such as comparisons
- Use codes/symbols to show discrete data

1 dot = 1 count

**Do**
- Use lines to demarcate discrete entities (geographic borders)
- Write clear titles and make labels short and to-the-point but complete
- Use callouts to highlight some regions when necessary
- Use color to enhance attractiveness and illustrate variation in data
- Use a sequential progression of colors from light to dark

**Do not**
- Place red and green side by side
- Use more than 3 to 4 colors or assume that color schemes displayed on computer monitor will look the same in print

---

**Spot Maps**

Reference:
- US Department of Health and Human Services National Institutes of Health

---

**Chloropleth Maps**

Reference:
- US Department of Health and Human Services National Institutes of Health
3. Describing Data Patterns/Analysis of Charts

1. Center

2. Spread

3. Shape
   - Symmetry
   - Peaks
   - Skewness

4. Unusual features
   - Gaps
   - Outliers

---

Describing Data Patterns

1. Center

The center of a distribution is located at the median of the distribution. This is the point where about half of the observations are on either side...
Describing Data Patterns

2. Spread of the distribution refers to the variability of the data.

If the observations are clustered around a single value, the spread is smaller.

If the observations cover a wide range, the spread is larger

---

Describing Data Patterns

3. Shape
   - Symmetry
   - Peaks
   - Skewness

---
Describing Data Patterns

4. Unusual features
   • Gaps – distribution where there are no observations
   • Outliers – extreme values that differ greatly from other observations

Report Writing

Dr. Lynette P. Adorio-Arce
Dr. Arthur B. Lagos

July 26, 2016
CTRL, Cebu City
Outline: The IMRAD Method

I - Introduction
M - Methods
R - Results
A - Analysis
D - Discussion and Interpretation
C - Conclusions
R - Recommendations

Outline of the Report

• Introduction - what who why where when
• Methods – how it was prepared and conducted
  - measurements
• Results – quanti and quali outputs, products
• Analysis – explanation of results
• Discussion – connects methods, results and analysis
• Conclusion – major points from discussion
• Recommendations – suggestions, advice
References:

How to describe data patterns in statistics.

End of Presentation
### Session 5. Training Data Management and Report Writing

**SESSION 5. EXERCISE ON TRAINING DATA MANAGEMENT AND REPORT WRITING (CASE STUDY)**

- **Training:** Basic TB Microscopy Course
- **Region:** Region 4B
- **Venue:** DOH RO 4A Training Center
- **Participants:** 12
- **Methodology:** Lecture presentation and laboratory practicum

**Laboratory practicum**

- Smear preparation: 4 smear preparation practicum; 10 smears per practicum
- Slide reading: 3 slide reading sessions; 10 smears per practicum

**Evaluation**

- Pre- and post-test
- Technical evaluation: results from smear preparation and slide reading practicum

**Course evaluation**

#### Table 1: Pre- and Post-Test Results (N=50 items)

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Table 2 cont'd: Smear Preparation Results

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### Table 3: Slide Reading Results

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</table>

HFP—high false positive  
HFN—high false negative  
MjQE—major quantification error  
LFP—low false positive  
LFN—low false negative  
MnQE—minor quantification error

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#### Practice reading 2

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<td>6. Jona Sweett</td>
<td>8</td>
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<td>7. Theress Menaling</td>
<td>9</td>
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<td>8. Rick Palencia</td>
<td>9</td>
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<tr>
<td>9. Loraine Grengia</td>
<td>8</td>
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<tr>
<td>10. Beatrice Alvarez</td>
<td>8</td>
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<td></td>
<td>1</td>
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<tr>
<td>11. Mario Salluta</td>
<td>8</td>
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<tr>
<td>12. Ichin Daclan</td>
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</tbody>
</table>

### Mean

### Median

### Mode

### Range
**Course Evaluation**

<table>
<thead>
<tr>
<th>Course management</th>
<th>Excellent</th>
<th>Good</th>
<th>Average</th>
<th>Below average</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Achievement of course objectives</td>
<td>6</td>
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<tr>
<td>Achievement of personal expectations</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Relevance of course to work</td>
<td>8</td>
<td>4</td>
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<tr>
<td>Organization of the course</td>
<td>8</td>
<td>4</td>
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<tr>
<td>Usefulness of the training materials</td>
<td>8</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Opportunities to ask questions and interact with trainers</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource persons have good mastery of topics</td>
<td>10</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training facilities</td>
<td>10</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time management</td>
<td>6</td>
<td>6</td>
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<td>Administrative support</td>
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<tr>
<td>Food</td>
<td>8</td>
<td>3</td>
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<tr>
<td>Accommodation</td>
<td>10</td>
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</table>

<table>
<thead>
<tr>
<th>Course length</th>
<th>Too long</th>
<th>Just right</th>
<th>Too short</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Overall rating of the course</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
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<td>1</td>
<td>8</td>
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</tbody>
</table>

1. Is there anything about the course that you think should have been included?
   - None

2. Was there anything about the course that you think should have been excluded?
   - None

3. Please list two or three topics on which you would like to spend MORE TIME or receive MORE INFORMATION
   - Waste management, especially for a facility with no space to bury infectious wastes
   - Quality control in TB laboratory

4. Please list topics on which you would like to spend LESS TIME or receive LESS INFORMATION
   - None

5. Additional comments
   - More practice in new recording and reporting forms
   - Some slides are difficult to read; many artefacts
SESSION 6. PLANNING, MONITORING, AND EVALUATION OF TRAINING PROGRAM

This session describes the steps in planning, monitoring, and evaluating training. Practical guidance is provided in the preparation of a training plan and a corresponding M&E plan.

Objectives

At the end of the session, the participants will be able to:

1. Discuss the importance of planning and M&E for training
2. Develop a regional microscopy training plan
3. Develop M&E indicators and plan for the implementation of the training plan

Methods

1. Lecture and discussion
2. Group work
3. Plenary presentation of plans for Luzon, Visayas, and Mindanao

Session content

1. Presentation and discussion on planning for training
   a. Pre-training activities
   b. Activities during training implementation
      – Post-training activities: Evaluation, reporting flow
2. Presentation and discussion on training monitoring
3. Presentation and discussion on training supervision
4. Presentation and discussion on training evaluation
5. Planning workshop–1 hour
   Product–Regional microscopy training plans (for Luzon, Visayas, Mindanao); M&E plans
6. Presentation of plans for Luzon, Visayas, and Mindanao–1 hour

Competencies

1. Develop evidence-based regional training plans (Luzon, Visayas, Mindanao)
2. Presents the plans clearly and logically

Duration: 3 hours
Overview of Planning, Monitoring and Evaluation as Management Functions

Joselito L. Cua, RMT, MPA
National Senior NTP Laboratory Trainer

Management functions

- Planning
- Organizing
- Leading
- Controlling
**Management function: Planning**

- Develop plans based on methods and logic
- 4 steps: establish goals, analyze current situation, identify aids/barriers, develop set of activities
- Deciding “what needs to be done, when and how it will be done, and who will do the actions”
- Analyze resources and decide how to use these to reach the objectives

---

**The planning cycle**

1. Gather Information
2. Mission & Goals
3. Devise Strategies
4. Implement Plan
5. Monitor Performance
6. Evaluate Plan
Steps in Planning

- Situational Analysis (TNA)
- Barrier or problem analysis
- Identify priority challenges
- Set priority objectives
- Develop activities

Importance of Plans

- Plans provide the organization's objectives, activities and procedures to reach the objectives and allow workers to carry out these activities

- Allow the organization to obtain and use resources to attain the objectives

- Allow managers to monitor and evaluate (measure) progress towards the objectives
### Action Plan

**Objective:**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Timeline</th>
<th>Products</th>
<th>Results / Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct 1 batch of Basic Training Course on TB Microscopy (BCTM)</td>
<td>2nd qtr. 2017</td>
<td>10 MTs trained</td>
<td>10 functional TMLs</td>
</tr>
</tbody>
</table>

### Monitoring and Evaluation

- Collective use of social science and epidemiologic methods

- Aim is to assess progress towards planned objectives, and address weaknesses in program performance

- Provides program managers with information / insight for...
  - Strategic planning
  - Program design and implementation
  - Decision making on human and financial resources
Monitoring

- **Monitoring** is an on-going process of collecting and analyzing information about program implementation.

Purpose:

a.) To assess whether or not activities are being carried out as planned and how these activities are being done.

b.) identifying problems and implementation bottlenecks. Data and information gathered through monitoring should be immediately processed, analyzed, and disseminated to stakeholders who can make the best use of such.

How to plan for training monitoring

Ideally planning for training monitoring should be carried out one to two quarters after the training due to the following considerations:

- This is to give adequate time for microscopist to prepare the laboratory set up.

- To obtain adequate accomplishment data. (At least for 1-2 quarter)

Before the activity, one needs to consider the following:

- Monitoring date (no conflict of schedule)
- Resources needed
- Availability of vehicle
- Monitoring checklist
Goal of monitoring

➢ To assess and evaluate microscopist performance in the field, if they adhere to the standard of the basic training course they have attended and completed.
   
   Example:
   - Completeness and accuracy of Laboratory Recording and reporting.
   - Standard Laboratory Set-up (smearing, staining and microscopy area) including collection area.
   - Laboratory Quality Control being practiced.
   - Observing Standard smearing, staining, microscopy etc.

Evaluation

The regular assessment of the process or development of any given program or project with particular focus on its effectiveness and impact.

Purpose:

● Better understand how the training is working.
● Make informal decisions regarding operations.
● Ensure most effective and efficient use of resources.
● Look at the extent to which the program/project is having or has had the desired impact and
● Fine-tune future program impact.
• Monitoring and evaluation ideally go hand-in-hand. While monitoring entails observation and description of how the project/program is being conducted, evaluation involves interpretation of results or change over time.

• The question in monitoring is: Are things going all right?

• The question in evaluation is: So, did it work?

Purpose of monitoring and evaluation

M&E

- measure program effectiveness
- identify problem areas
- improve overall performance
- gather lessons learned
Plans and MSE

- Plans provide the organization's objectives, activities and procedures to reach the objectives and allow workers to carry out these activities.

- Allow the organization to obtain and use resources to attain the objectives.

- Allow managers to monitor and evaluate (measure) progress towards the objectives.

---

M&E Plan

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Method of data collection</th>
<th>Person responsible for data collection and reporting</th>
<th>Frequency of data collection and reporting</th>
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</thead>
<tbody>
<tr>
<td>1. Number of MTs trained: 8</td>
<td>Training reports</td>
<td>RC</td>
<td>Annual</td>
</tr>
<tr>
<td>2. Number of functional TMLs:6</td>
<td>Monitoring reports</td>
<td>RC</td>
<td>Annual</td>
</tr>
</tbody>
</table>
A GOAL without a PLAN IS JUST A WISH!
SESSION 6. PLANNING FORMAT

*Regional Training Plan*

<table>
<thead>
<tr>
<th>Group:</th>
<th>Date:</th>
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<table>
<thead>
<tr>
<th>Objective</th>
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<table>
<thead>
<tr>
<th>Activities</th>
<th>Timeline</th>
<th>Resources</th>
<th>Product</th>
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## SESSION 6. MONITORING AND EVALUATION FORMAT

### Regional Training Plan

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<th>Objective</th>
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<table>
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<th>Activities</th>
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<th>Resources</th>
<th>Product</th>
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</table>
SESSION 7: DEVELOPING TEACHING SKILLS

This session provides the participants with the steps and insights in making effective presentations, including the development of visual aids, and tips in preparing for the presentation. Each participant will be given the opportunity to demonstrate presentation skills.

Objectives

At the end of the session, the participants will be able to:

1. Describe the steps to make effective presentations
2. Demonstrate effective presentation skills

Method

1. Presentation, discussion, and demonstration
2. Individual work to develop an effective presentation
3. Participants demonstrate delivery of effective presentation

Session content and products

1. Lecture and discussion on effective presentation
2. Workshop to develop an effective training presentation
3. Participants will draw lots on the topic for developing presentations
4. Participants’ demonstrate an effective presentation–8 hours

Product: individual 20 minute presentations

Competency

1. Able to develop an effective presentation
2. Able to deliver an effective presentation
Session 7

Developing Teaching Skills

Author: Arthur B. Lagos MD
Management Sciences for Health

Session objectives

Participants will be able to:
1. Describe the steps to make effective presentations;
2. Demonstrate effective presentation skills
Introduction

- Training is more than giving a lecture or demonstration...
- Training success rests on how well you equipped workers to improve their performance.
- Your goal is to facilitate learning... not to bore, ignore, or alienate individuals who are undergoing training.
- Your presentation skills is the way through which learning occurs – to make learning easy and accessible.

Steps to effective presentations

1. Preparation is the key to a high-impact presentation: involves researching the topic, writing the presentation, consulting, and practicing the presentation.

2. Steps...
   1) Basic preparations
   2) Final preparations
1. Basic Preparations

Basic Preparations

1. Understand the occasion

2. Develop the session objectives

3. Develop the topic and training aids or materials based on the objectives

3 Steps
Basic Preparations:

1. Understand the occasion

1. What is the purpose of the training?
2. What are objectives of the training program?
3. Profile the audience:
   - training needs (the performance gap)
   - demography
   - background
4. What is the size of the training group?
5. Know the venue

Basic Preparations:

2. Develop the session objectives

- Objectives: what the participants must achieve at the end of your session
- Your direction guide for the presentation
- Your objectives should conform with the program’s objectives and should address the participants’ needs
  - SMART objectives:
    - Specific,
    - Measurable,
    - Attainable,
    - Realistic,
    - Time-bound
Basic Preparations:

3. Develop the topic

- Examine the session objectives
- Focus on the major points to deliver to the audience
- Include the major knowledge and skills needed by the audience to attain the objectives
- Avoid or minimize unnecessary information
- Treat each audience as unique – avoid “canned” presentations

Prepare Training Aids (1)

- **Select** your training aids: Power Point slides, overhead transparencies, models, charts, pictures, etc.
- **Identify** the training needs to be addressed
- **Plan** and **design** your training aids
- **Produce** and **test** your aids – revise as needed
- **Finalize** the training aids
Characteristics of Effective Visual Aids

Visible: easily seen, easily read

Interesting: attracts attention; promotes retention

Simple: easy to understand; highlight key words or concepts

Accurate: information is updated, factual, and complete

Practical: content is application oriented

Suggestions for Preparing Slides

- 7x7 rule: not more than 7 lines per slide
  - not more than 7 words per line

- Minimum 24 font size

- Use titles or headings

- Use key words only

- Use a maximum of 3 colors

- Use drawings or artwork for interest
Delivering the presentation

Pointers: Delivering the Presentation

- 3 parts of the presentation:
  - Introduction
  - Discussion
  - Conclusion
**Giving the Introduction**

- **“Attention getters”** – related stories, anecdotes, visual aids, shocking statements, statistics, question technique, etc.

- **“Preview”**
  - “what is the session all about?”
  - “what’s in it for the audience?”
  - “present an outline of the talk”

**Delivering the discussion**

- 3 principles for an effective discussion

  - **Main points are clear**
  - Arranged in a logical sequence
  - Supported by facts or data:
    - Statistics
    - Experiences (your own)
    - Demonstrations
    - Analogy
    - Testimony
    - Exhibits
Concluding the presentation

- Review or recap the discussion with 1 or 2 sentences - *in past tense!*

- End the presentation with a *memorable* statement
  - a final quotation
  - a question
  - an “attention getter”

Suggestions for Preparing Slides

- **7x7 rule**: not more than 7 lines per slide
  - not more than 7 words per line

- Minimum **24 font** size

- Use **titles** or headings

- Use **key words** only

- Use a maximum of **3 colors**

- Use drawings or **artwork** for interest
Looking at Presentation skills

- Verbal delivery skills
  - Have a good start: a good introduction
  - Set the mood: start on time, control your enthusiasm
  - Voice: pace, pitch, volume, interest / meaning

- Non verbal delivery skills
  - Body: posture, position, mannerisms
  - Hand gestures, facial expressions, eye contact
  - Avoid: side to side swaying, fiddling with objects, meaningless gestures, to and fro pacing

Handling difficult participants

- Argumentative, antagonistic or disagreeable participants

- Overly talkative or dominant participants

- Those engaged in side conversations

- Those with wrong or irrelevant responses

- Quiet or shy participants
Final Preparations (1/2)

- Rehearse the presentation… *practice* your skills

- Verbal delivery skills:
  - be… pleasant, natural, dynamic, expressive, and easily heard

- Non-verbal delivery skills:
  - posture,
  - hand gestures,
  - body movements,
  - facial expressions,
  - eye contact
Final Preparations (2/2)

- Check and review your notes

- Prepare your attire
  - Avoid over or under dressing
  - Use appropriate attire

- Check the venue
  - Audio and video equipment
  - Conference room layout
  - Seating arrangement
### SESSION 7. RUBRICS FOR DEVELOPING TEACHING SKILLS

Name of trainee: ______________________  Roster number: ______________________
Position and area of assignment: ______________________

<table>
<thead>
<tr>
<th>Core competencies</th>
<th>Demonstrated effectiveness</th>
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<td></td>
<td>Not effective</td>
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<tr>
<td><strong>Teaching methods</strong></td>
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</tr>
<tr>
<td>1. Provides an effective introduction</td>
<td></td>
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<tr>
<td>2. Establishes rapport</td>
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<td>3. Emphasizes and provides examples of key points</td>
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<td>4. Exhibits knowledge of material</td>
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<tr>
<td>5. Answers questions effectively</td>
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<td>6. Facilitates discussion</td>
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<td>7. Manages participants' behavior</td>
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<td>8. Makes smooth transitions</td>
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<td>9. Provides effective explanations</td>
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<td>10. Provides clear summaries</td>
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<tr>
<td><strong>Facilitation skills</strong></td>
<td></td>
</tr>
<tr>
<td>1. Encourages group participation</td>
<td></td>
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<tr>
<td>2. Checks for understanding</td>
<td></td>
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<tr>
<td>3. Uses training equipment effectively</td>
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<td><strong>Verbal skills</strong></td>
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<tr>
<td>1. Pleasant</td>
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<td>2. Natural</td>
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<td>3. Dynamic</td>
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<td>4. Expressive</td>
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<td>5. Easily heard</td>
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<tr>
<td><strong>Nonverbal skills</strong></td>
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</tr>
<tr>
<td>1. Posture</td>
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<tr>
<td>2. Hand gestures</td>
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<td>3. Body movements</td>
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<td>4. Facial expressions</td>
<td></td>
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<td>5. Eye contact</td>
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<td><strong>Trainer support materials</strong></td>
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</tr>
<tr>
<td>1. Effective teaching materials</td>
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<td>2. Visible, effective flip charts</td>
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</tr>
<tr>
<td>3. Visible, effective overheads</td>
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<td>4. Visible, effective print materials</td>
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</tr>
<tr>
<td>5. Visible, effective slides</td>
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</table>

Senior trainer: ______________________
## ANNEX 1: PROGRAM OF ACTIVITIES

<table>
<thead>
<tr>
<th>Time</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
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</thead>
<tbody>
<tr>
<td>8:00–8:15</td>
<td>Registration</td>
<td>Session 4</td>
<td>Session 5 continued (oral presentation</td>
<td>Session 7 continued (participants'</td>
<td>Workshop Evaluation and post-test</td>
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<tr>
<td></td>
<td></td>
<td>Microscopy Reading</td>
<td>of written report and critiquing)</td>
<td>demonstration)</td>
<td></td>
</tr>
<tr>
<td>8:15–8:30</td>
<td>Opening program/course orientation</td>
<td>Presentation and discussion on filling</td>
<td>Planning, Monitoring, and Evaluation of</td>
<td></td>
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<tr>
<td></td>
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<td>out forms</td>
<td>Training Program</td>
<td></td>
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<tr>
<td>8:30–8:45</td>
<td>Pre-test</td>
<td>How to conduct training on microscopy</td>
<td>Planning exercise</td>
<td></td>
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<tr>
<td>8:45–9:00</td>
<td>Session 1 (presentation and discussion)</td>
<td>Reading</td>
<td>Presentation of Luzon, Visayas, and</td>
<td>Session 7 continued (participants'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overview of the Training Process and</td>
<td>• Review of standard reporting scale</td>
<td>Mindanao plans</td>
<td>demonstration)</td>
<td></td>
</tr>
<tr>
<td>9:00–9:30</td>
<td>Training Management</td>
<td>• Exercise 1</td>
<td></td>
<td>Developing Teaching Skills</td>
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<td>9:30–10:00</td>
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<tr>
<td>10:15–10:45</td>
<td>Session 2A (presentation and discussion)</td>
<td>Session 4 continued</td>
<td>Session 6 continued</td>
<td>Session 7 continued (participants'</td>
<td>Closing</td>
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<tr>
<td></td>
<td>Principles and Practices of TB Laboratory</td>
<td>How to conduct training on microscopy</td>
<td>Planning, Monitoring, and Evaluation of</td>
<td>demonstration)</td>
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<td></td>
<td>Biosafety</td>
<td>Reading</td>
<td>Training Program</td>
<td>Developing Teaching Skills</td>
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<tr>
<td>10:45–11:15</td>
<td>Session 2B (presentation and discussion)</td>
<td>Presentation and discussion on filling</td>
<td>Planning exercise</td>
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<td></td>
<td>Principles and Practices of TB Laboratory</td>
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<td>Presentation of Luzon, Visayas, and</td>
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<td></td>
<td>Waste Management</td>
<td></td>
<td>Mindanao plans</td>
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<tr>
<td>11:15–11:45</td>
<td>Session 2C (presentation and discussion)</td>
<td>Exercise on microscopy reading</td>
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<td>Principles and Practices of Quality</td>
<td>Discussion of microscopy results and</td>
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<td>Assurance</td>
<td>feedback</td>
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<td>11:45–12:00</td>
<td>Plenary discussion</td>
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<tr>
<td>1:00–3:00</td>
<td>Session 3 (presentation and discussion)</td>
<td>Session 4 continued</td>
<td>Session 7 (presentation, discussion, and</td>
<td>Session 7 continued</td>
<td>Tutorials by trainers</td>
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<td>Standardized Assessment of Stained Smears</td>
<td>Practice Session on Arranging Coded Slides</td>
<td>demonstration)</td>
<td>continued (participants' demonstration)</td>
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<td>Review of standard smear assessment points</td>
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<td>Developing Teaching Skills</td>
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<td></td>
<td>and introduction of form 1</td>
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<td>2:00–3:00</td>
<td>Presentation and discussion on stained</td>
<td>Session 5 (presentation and discussion)</td>
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<td>Writing</td>
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<td>3:15–5:00</td>
<td>Session 3 continued (presentation and</td>
<td>Session 5 continued</td>
<td>Session 7 continued (workshop)</td>
<td>Session 7 continued (participants'</td>
<td>Tutorials by trainers</td>
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<td></td>
<td>discussion)</td>
<td>Training Data Management and Report</td>
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<td>demonstration)</td>
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<td></td>
<td>Standardized Assessment of Stained Smears</td>
<td>Writing</td>
<td></td>
<td>Developing Teaching Skills</td>
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<td></td>
<td>Exercise on filling out forms 2 and 3</td>
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ANNEX 2: SESSION CHAIRS AND FACILITATORS

Date: July 25-29, 2016

Course title: Enhanced Training of Trainers for Basic TB Microscopy

<table>
<thead>
<tr>
<th>Session #</th>
<th>Session title</th>
<th>Name of chair/facilitators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of the Training Process and Training Management</td>
<td>Chair: Dr. Arthur B. Lagos</td>
</tr>
<tr>
<td>2A</td>
<td>Principles and Practices of TB Laboratory Biosafety</td>
<td>Chair: Ms. Marienella P. Galit</td>
</tr>
<tr>
<td>2B</td>
<td>Principles and Practices in Laboratory Waste Management</td>
<td>Chair: Dr. Arthur B. Lagos</td>
</tr>
<tr>
<td>2C</td>
<td>Principles and Practices of Quality Assurance</td>
<td>Chair: Joselito L. Cua RMT</td>
</tr>
<tr>
<td>3</td>
<td>Standardized Assessment of Stained Smears</td>
<td>Chair: Marienella P. Galit, Facilitators: Lucy B. Aguiman RMT, Joselito L. Cua RMT</td>
</tr>
<tr>
<td>4</td>
<td>Microscopy Reading</td>
<td>Chair: Lucy B. Aguiman RMT, Facilitators: Joselito L. Cua RMT, Marienella P. Galit</td>
</tr>
<tr>
<td>5</td>
<td>Data Management and Report Writing</td>
<td>Chair: Dr. Lynette P. Adorio-Arce Facilitator: Marienella P. Galit</td>
</tr>
<tr>
<td>6</td>
<td>Planning, Monitoring, and Evaluation of Training Program</td>
<td>Chair: Joselito L. Cua RMT</td>
</tr>
<tr>
<td>7</td>
<td>Developing Teaching Skills</td>
<td>Chair: Dr. Arthur B. Lagos, Facilitators: Dr. Lynette P. Adorio-Arce, Marienella P. Galit, Joselito L. Cua RMT, Lucy B. Aguiman RMT,</td>
</tr>
</tbody>
</table>
ANNEX 3: PRE-TEST QUESTIONS

Name: ___________________________________________ Technical Unit: ___________________________________________

Answer the questions accordingly:

1. What are the characteristics of a good smear?
   a. Made from mucopurulent sputum
   b. Spread evenly and repeated in coil-type form
   c. Thin enough to read newsprint through after drying
   d. Air dried before being fixed by flaming
   e. Acid-fast bacilli (AFB) are distinctly red in color against amorphous blue background
   f. All of the above
   g. a and d only
   h. c, d, and f only

2. What is the standard size of the sputum smear? _____________

3. How many oil immersion fields (OIFs) need to be examined for a negative result? _____________

4. How many visual fields with AFBs are required to report a 2+ smear? Give the number of visual fields and the number of AFB per field. ____________

5. ____________ is a system designed to improve the reliability and efficiency of laboratory services.

6. ____________ is the process done by the external quality assessment controller to recheck the slides from the peripheral microscopy laboratory.

7. ____________ is the on-going process to track the progress of program implementation.

8. True or false: Monitoring and evaluation go hand-in-hand. Monitoring entails observation and description of how the project/program is being conducted and evaluation involves interpretation of results or change over time.

9. The median refers to...
   a. 50% of the values    c. Middlemost position
   b. Middlemost value    d. None of the above

10. A bar chart has the following functions:
    a. Shows comparison of magnitude    d. a and b
    b. Plots counts    e. a and c
    c. Shows parts of the whole    f. b and c
12. True or false: Training and capacity building are the same.
13. Which of the following is true for training?
   a. An organized activity aimed at imparting information and/or instructions to workers
   b. Training tries to reduce or eliminate the “performance gap”
   c. Training is considered a unique service
   d. All of the above
   e. a only
   f. a and b only
14. Which of the following is true for capacity building?
   a. The creation of an enabling environment with appropriate policy and legal frameworks
   b. Organizational development
   c. Human resource development
   d. All of the above
   e. a and c only
   f. b and c only
   g. c only
15. The steps in the training process include:
   a. Assess training needs, create specific objectives
   b. Select training methods, implement training
   c. Evaluate the training, feedback the evaluation results to stakeholders
   d. a only
   e. a and b only
   f. a, b, and c
16. True or false: The training management cycle is a conceptual framework to manage training as a cycle
17. The training management cycle includes which of the following:
   a. Planning
   b. Implementation
   c. Evaluation
   d. All of the above
18. ____________ is any object, situation, or act that potentially harms humans through injury or ill health, or a combination of these.
19. ____________ is the likelihood that a hazard will cause a specific injury (e.g., ill-health) to any person.
20. ____________ is a type of hazard that includes medical waste or samples of a microorganism, virus, or toxin
21. ____________ is a set of control measures to reduce or eliminate exposure of laboratory worker to biohazards
PRE-TEST ANSWER KEY

Name: ____________________________ Technical Unit: ____________________________

Answer the questions accordingly:

1. What are the characteristics of a good smear?
   
   F
   
   a. Made from mucopurulent sputum  
   b. Spread evenly and repeated in coil-type form  
   c. Thin enough to read newsprint through after drying  
   d. Air dried before being fixed by flaming  
   e. Acid-fast bacilli (AFB) are distinctly red in color against amorphous blue background  
   f. All of the above  
   g. a and d only  
   h. c, d, and f only

2. What is the standard size of the sputum smear? ____________

   Approximately 3 cm × 2 cm

3. How many oil immersion fields (OIFs) need to be examined for a negative result? ____________

   300 OIFs

4. How many visual fields with AFBs are required to report a 2+ smear? Give the number of visual fields and the number of AFB per field. ____________

   At least 50 visual fields with 1-10 AFBs/field

5. ____________ is a system designed to improve the reliability and efficiency of laboratory services.

   Quality assurance system

6. ____________ is the process done by the external quality assessment controller to recheck the slides from the peripheral microscopy laboratory.

   Blinded rechecking

7. ____________ is the on-going process to track the progress of program implementation.

   Monitoring

8. True or false: Monitoring and evaluation go hand-in-hand. Monitoring entails observation and description of how the project/program is being conducted and evaluation involves interpretation of results or change over time.

   True

9. The median refers to…

   C

   a. 50% of the values  
   b. Middlemost value  
   c. Middlemost position  
   d. None of the above

10. A bar chart has the following functions:

    D

    a. Shows comparison of magnitude  
    b. Plots counts  
    c. Shows parts of the whole  
    d. a and b  
    e. a and c  
    f. b and c
11. True or false: Training and capacity building are the same.

12. Which of the following is true for training?
   a. An organized activity aimed at imparting information and/or instructions to workers
   b. Training tries to reduce or eliminate the “performance gap”
   c. All of the above
   d. a only
   e. a and b only

13. Which of the following is true for capacity building?
   a. The creation of an enabling environment with appropriate policy and legal frameworks
   b. Organizational development
   c. Human resource development
   d. All of the above
   e. a and c only
   f. b and c only
   g. c only

14. The steps in the training process include:
   a. Assess training needs, create specific objectives
   b. Select training methods, implement training
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15. True or false: The training management cycle is a conceptual framework to manage training as a cycle

16. The training management cycle includes which of the following:
   a. Planning
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   c. Evaluation
   d. All of the above

17. ___________ is any object, situation, or act that potentially harms humans through injury or ill health, or a combination of these.

18. ___________ is the likelihood that a hazard will cause a specific injury (e.g., ill-health) to any person.

19. ___________ is a type of hazard that includes medical waste or samples of a microorganism, virus, or toxin

20. ___________ is a set of control measures to reduce or eliminate exposure of laboratory worker to biohazards
ANNEX 4: POST-TEST QUESTIONS

Name: ____________________________  NTRL Technical Unit: ____________________________

Answer the following questions accordingly:

1. If there are red stains on the smear background, what is the most likely cause?
   a. Improper selection or fish-out of specimen
   b. Over-fixed smears
   c. Insufficient decolorization
   d. Salivary specimen

2. If the smear has sloughed off, what is the most likely cause?
   a. Improper selection or fish-out of specimen
   b. Over-fixed smears
   c. Insufficient decolorization
   d. Salivary specimen

3. How many fields need to be examined for a heavy positive 3+?

4. True or false: You must scan 100 fields even when you find 3+ smears.

5. Enumerate the 3 elements of quality control.

6. What is the importance of running a quality control of AFB stains?

7. What is the importance of a plan?
   a. Plans provide the organization’s objectives, activities, and procedures to reach the objectives and allow workers to carry out these activities
   b. It allows the organization to obtain and use resources to attain the objectives
   c. It allows managers to monitor and evaluate (measure) progress toward the objectives
   d. a and b only
   e. a and c only
   f. b and c only
   g. a, b, and c only
   h. None of the above

8. The purposes of monitoring and evaluation are:
   a. Measure program effectiveness
   b. Identify problem areas
   c. Improve overall performance
   d. Gather lessons learned
   e. All of the above
   f. a and c only
   g. b and d only
   h. a and b only
   i. f and g only
   j. all except d

9. When reporting results of training tests, it is best to use
   a. Mean
   b. Median
   c. Mode
   d. Range
10. The objectives of the training are reported in:
   a. Results  
   b. Discussion  
   c. Introduction  
   d. Methods  
   e. Analysis  
   f. Interpretation  

11. Training is…
   a. More than giving a lecture or demonstration  
   b. Training success rests on how well the training has equipped workers to improve their job performance  
   c. The goal of training is to facilitate learning…not to bore, ignore, or alienate the trainees  
   d. All of the above  
   e. a and b only  
   f. b and c only  

12. Training objectives refer to…
   a. What the participants must learn at the end of the session  
   b. Your directional guide for the presentation  
   c. Being described as SMART  

13. Effective visual aids are…
   a. Visible: easily seen, easily read  
   b. Interesting: attracts attention, promotes retention  
   c. Simple: easy to understand, highlights key words or concepts  
   d. Accurate: information is updated, factual, and complete  
   e. Practical: content is application-oriented  
   f. All of the above  
   g. a, b, d, and e only  
   h. a, c, and e only  

14. The parts of a presentation refer to ___
   a. Introduction, discussion, and conclusion  
   b. Introduction, body, conclusion, and recommendations  
   c. Introduction, methods, findings, and conclusion  

15. Effective discussions are those…
   a. Whose main points are clear  
   b. Arranged in a logical sequence  
   c. Supported by facts or data  
   d. All of the above  
   e. b and c only  

16. Discussion can be supported by which of the following:
   a. Statistics  
   b. Experiences (your own)  
   c. Demonstrations  
   d. Analogy  
   e. Testimony  
   f. Exhibits  
   g. All of the above  
   h. None of the above  

17-20. Give at least 2 work hazards present in a TB laboratory and give one example of each (4 points)

<table>
<thead>
<tr>
<th>Hazards in TB laboratory</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>17.</td>
<td>18.</td>
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<tr>
<td>19.</td>
<td>20.</td>
</tr>
</tbody>
</table>
POST-TEST ANSWER KEY

Answer the following questions:

1. If there are red stains on the smear background, what is the most likely cause?
   a. Improper selection or fish-out of specimen
   b. Over-fixed smears
   c. Insufficient decolorization
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   a. Improper selection or fish-out of specimen
   b. Over-fixed smears
   c. Insufficient decolorization
   d. Salivary specimen

3. How many fields need to be examined for a heavy positive 3+?
   At least 20 visual fields with more than 10 AFB/field

4. True or false: You must scan 100 fields even when you find 3+ smears.
   True

5. Enumerate the 3 elements of quality control.
   Administration, Specimen submission, and Microscopy

6. What is the importance of running a quality control of AFB stains?
   To ensure that the solutions work well and that they are not contaminated with AFB

7. What is the importance of a plan?
   a. Plans provide the organization’s objectives, activities, and procedures to reach the objectives and allow workers to carry out these activities
   b. It allows the organization to obtain and use resources to attain the objectives
   c. It allows managers to monitor and evaluate (measure) progress toward the objectives
   d. a and b only
   e. a and c only
   f. b and c only
   g. a, b, and c only
   h. None of the above

8. The purposes of monitoring and evaluation are:
   a. Measure program effectiveness
   b. Identify problem areas
   c. Improve overall performance
   d. Gather lessons learned
   e. All of the above
   f. a and c only
   g. b and d only
   h. a and b only
   i. f and g only
   j. all except d

9. When reporting results of training tests, it is best to use
   a. Mean
   b. Median
   c. Mode
   d. Range
10. The objectives of the training are reported in:
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   b. Discussion
   c. Introduction
   d. Methods
   e. Analysis
   f. Interpretation

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   b. Training success rests on how well the training has equipped workers to improve their job performance
c. The goal of training is to facilitate learning… not to bore, ignore, or alienate the trainees
d. All of the above
e. a and b only
f. b and c only

12. Training objectives refer to…
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17-20. Give at least 2 work hazards present in a TB laboratory and give one example of each (4 points)

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<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>17. Biological Hazards (Examples: molds, insects, pests)</td>
<td>18. Physical Hazards (Examples: noise, extreme temperature, radiation, vibration)</td>
</tr>
<tr>
<td>19. Chemical Hazards: (Examples: fumes, pesticides, cleaning products, asbestos, respirable dust)</td>
<td>20. Safety Hazards (Examples: faulty equipment, unsafe access)</td>
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</table>
ANNEX 5 TRAINING EVALUATION FORM

Please provide comments on the following:

Training Process

Time Management

Individual Exercises

Group Exercises

Small Group Presentations

Plenary Discussion

Facilitators

Venue and Service