ENSURE LABORATORY SUPPORT FOR TB CONTROL

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Acknowledgements

Management of Tuberculosis
Training for District TB Coordinators

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Ensure Laboratory Support for TB Control

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Request for Sputum Examination
Tuberculosis Laboratory Register
Ensure Laboratory Support for TB Control

Introduction

The diagnosis of tuberculosis at health facilities relies on sputum microscopy to detect infectious cases of pulmonary TB. A **TB microscopy unit** is a site with at least one microscope suitable for doing sputum smear examination for TB and at least one trained microscopist. The microscopist performs direct microscopic examination of stained sputum smears for tubercle bacilli, using the Ziehl–Neelsen technique.

The most important function of a TB microscopy unit is the **diagnosis** of infectious cases of pulmonary TB by examination of sputum smears. Health facilities submit sputum samples for diagnosis of TB suspects, that is, an adult who has been coughing for 2 weeks or more or a person with symptoms or signs suggestive of pulmonary TB upon medical examination.

TB microscopy units also examine **follow-up** sputum smears to:

- monitor at certain times during treatment whether a patient is smear-positive or smear-negative, and
- document cure at the end of treatment for patients who initially had smear-positive pulmonary TB.

The TB laboratory network in a country should include in each district one or more TB microscopy units that perform sputum smear microscopy. The network should also include technical expertise and additional laboratory services at higher levels for training and supervision of staff in TB microscopy units. A TB microscopy unit may be located at a health facility or the district hospital or any hospital at the first referral level. The TB microscopy units are the most important part of the TB laboratory network.

TB microscopy units should receive supervision and support from the district TB laboratory supervisor and also from the provincial laboratory supervisor. The technical expertise in the laboratory network is very important for quality control of TB microscopy and the safety of personnel in TB microscopy units. The laboratory supervisor at the provincial level is responsible for quality assessment of how slides are prepared and read. A provincial-level laboratory should be able to perform culture for diagnostic purposes if needed or isolate mycobacteria to send to a reference laboratory at the national level for drug susceptibility testing.

Every health facility providing TB control services must have reasonable **access** to a TB microscopy unit. If the TB microscopy unit is not in the same facility, the TB microscopy unit should be located near the TB control services, and there should be regular and reliable transportation of sputum samples and results between the health facility and the TB microscopy unit.

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1 This module uses the term microscopist for the individual who is trained to perform the tasks of the TB microscopy unit, which include preparing and reading sputum slides. This individual may or may not have broader training in laboratory skills.
As District TB Coordinator, you should collaborate with the district laboratory supervisor to assess the TB microscopy workload and its distribution, using information on the number of sputum smear examinations performed at TB microscopy units and the number of microscopes and microscopists at each. Stay informed of the locations of all TB microscopy units to confirm that each health facility has reasonable access to TB sputum smear microscopy. Also assess whether TB microscopy units are providing timely microscopy results to health workers for diagnosis and management of TB patients.

Objectives of this module

**Participants will learn how to:**

<table>
<thead>
<tr>
<th><strong>Refer to section:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
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<tr>
<td>1.3–1.4</td>
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<tr>
<td>1.5</td>
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<tr>
<td>2.1</td>
</tr>
<tr>
<td>2.3</td>
</tr>
<tr>
<td>2.5–2.7</td>
</tr>
</tbody>
</table>

- Assess whether health facilities have access to a TB microscopy unit
- Assess the TB microscopy workload and how it is distributed in the district
- Determine whether there is a need to increase the capacity of the TB laboratory services
- Review the *Tuberculosis Laboratory Register* and verify that all smear-positive cases are registered accurately in the *District TB Register*
- Review the *Tuberculosis Laboratory Register* to identify problems
- Check briefly whether microscopists keep slides for quality assurance and have sufficient equipment and supplies, and trained staff

If you need to look up an unfamiliar word, refer to the glossary at the end of module A: *Introduction.*
1. Collaborate with the district TB laboratory supervisor to ensure sufficient TB laboratory services

1.1 What tasks are performed at a TB microscopy unit?

When sputum samples are received at a TB microscopy unit, the microscopist:

- logs in the sputum samples,
- prepares sputum smear microscopy slides for Ziehl–Neelsen staining,
- stains, dries and reads microscopy slides,
- when the set of slides has been read, records the results on the Request for Sputum Examination form as well as in the Tuberculosis Laboratory Register (see Annex), and
- sends the results back to the health facility.

Samples should be processed and results reported within 24 hours of receipt at the laboratory.

The TB microscopy unit must perform these steps accurately and within a reasonable time. When the results are received at the health facility, the health worker records the results in the Register of TB Suspects and/or on the TB Treatment Card and informs the TB suspect or TB patient. The health worker must ensure that any smear-positive patient starts treatment.

In addition, each TB microscopy unit:

- stores all negative and positive slides for quality assurance under proper storage conditions,
- maintains the microscope and microscopy supplies under proper storage conditions,
- follows safety measures for handling, smearing and fixing sputum samples including disinfection of bench, assuring proper ventilation and hand washing,
- monitors supplies and reagents stocks and informs supervisor regularly, and
- sends sputum samples for culture to the provincial laboratory, when requested.

1.2 Assess whether every health facility has access to a TB microscopy unit

Every health facility that provides TB control services must have access to a TB microscopy unit. A TB microscopy unit may be a room in the same facility that does TB case detection and treatment or in a different location. If there is no TB microscopy unit in the health facility, a TB microscopy unit should be located nearby, and there should be regular and reliable transportation of sputum samples and results between the health facility and the TB microscopy unit.
Study the locations of the TB microscopy units on the map of the district.

Consider whether every health facility has reasonable access to a TB microscopy unit, given the transportation available for sending sputum samples to a TB microscopy unit and for sending results back to the health facility. Reasonable access would mean that all sputum samples can be transported to the TB microscopy unit within 24–48 hours.

The time from collection of a TB suspect’s first sputum sample until the suspect’s three samples reach the TB microscopy unit should be less than 1 week.

Now do Exercise A – Written Exercise

When you have reached this point in the module, turn to Exercise A on page 24 and follow the instructions. When you have finished writing answers to the questions, review your work with a facilitator.

1.3 Annually assess the TB microscopy workload

A direct relationship exists between the workload of the microscopists and the quality of microscopy. The number of smears examined per microscopist per day should not exceed 20. If more examinations are attempted by one individual, visual fatigue will lead to a deterioration of reading quality. Reading 20 sputum slides takes a microscopist about 2.5 hours. The microscopist can do other work in the laboratory during the day, including preparing TB slides, or examining other samples such as blood or urine, or doing HIV testing.

However, proficiency in reading smears can only be maintained by examining at least 10–15 smears per week, that is, a minimum of 2–3 smears per day.

It is therefore important to assess periodically whether the workload of each microscopist is too much or too little. This is done by determining the average number of sputum smear examinations performed by each TB microscopy unit and microscopist per day. (Note that 2 microscopists can use one microscope in a day. A unit with 3 microscopists would require two microscopes.)

The recommended range of TB sputum smears to be read by a microscopist is:
- at least 2–3 per day to maintain proficiency, and
- not more than 20 per day to avoid visual fatigue and deterioration of quality.
Once a year, meet with the district laboratory supervisor to assess the TB microscopy workload. The district laboratory supervisor will have records of the number of sputum smears examined at each TB microscopy unit and in the district as a whole during the past month, quarter, or year.\(^1\) (Note: A month usually includes 22 workdays; a quarter has 66 workdays; and a year has 264 workdays.)

To assess workload, divide the number of smears examined by the number of workdays in the period to determine the average number of smears examined in the district each day. You can then divide by the number of microscopists to determine the average daily number of smears per microscopist.

**Example**

In Patanga District, there are two TB microscopy units: one is in the district hospital and has 2 microscopists; the other is in a health centre and has 1 microscopist. The total number of sputum examinations performed in Patanga District in the 2nd quarter of 2004 was 3,800.

\[
\frac{3,800 \text{ examinations}}{66 \text{ workdays per quarter}} = 58 \text{ examinations in the district per day on average}
\]

\[
\frac{58 \text{ examinations per day}}{3 \text{ microscopists}} = 19 \text{ examinations per day per microscopist}
\]

This result is within the recommended range of 2–20 smear examinations per microscopist per day, but we do not know how much of the work is done at the district hospital and how much at the health centre.

In districts like Patanga, where there is more than one TB microscopy unit, it is also helpful to assess the workload of each unit individually. When the workload of each TB microscopy unit is calculated separately, the results show how the district workload is distributed.

**1.4 Assess distribution of the TB microscopy workload in the district**

Study the locations of the TB microscopy units on a map of the district to see whether they are close to health facilities with more patients.

In densely-populated areas with adequate transport and communications, fewer TB microscopy units are required to handle the workload, but more microscopists are needed at each (2 microscopists per microscope). In remote and sparsely populated areas, more TB microscopy units may be needed to provide access for more dispersed health facilities.

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\(^1\) The district laboratory supervisor should also provide monthly reports on the number of persons whose sputum was examined for diagnosis and the number whose sputum was smear-positive. These numbers are needed for calculating indicators related to case detection in the district, which you will learn about in module *G: Monitor and Evaluate TB Control.*
In Patanga District, the TB microscopy unit at the hospital does 2,000 smear examinations per quarter. The TB microscopy unit in the health centre does 1,800 examinations per quarter.

At the hospital:
\[
\frac{2,000 \text{ sputum examinations}}{66 \text{ workdays}} = 30 \text{ sputum examinations in the hospital per day on average}
\]
\[
\frac{30 \text{ sputum examinations per day}}{2 \text{ microscopists}} = 15 \text{ sputum examinations per day per microscopist}
\]

In the health centre:
\[
\frac{1,800 \text{ sputum examinations}}{66 \text{ workdays}} = 27 \text{ sputum examinations per microscopist per day}
\]

In the TB microscopy unit in the health centre, on average, 27 smears are done by 1 microscopist per day. This exceeds the recommended limit of 20 smears per microscopist per day and shows there is a problem with workload distribution. Some of the workload needs to be transferred to the hospital TB microscopy unit, or another microscopist should be added at the overburdened TB microscopy unit.

1.5 Determine whether there is a need to increase the capacity of the TB laboratory services

Your assessment of the workload of TB microscopy units and the distribution of that workload in the district will show whether all health facilities providing TB control services have sufficient laboratory support.

Indications that there is a need to increase the capacity of the TB laboratory services include:

- Too many smears are done per day in a TB microscopy unit or per microscopist.
- TB microscopy units are not well located in the district, considering locations of health facilities, population distribution, or available transportation for samples and results.
- Increases are expected in the number of sputum samples sent for examination (for example, because additional health facilities will begin providing TB control services).

Possible ways to increase capacity include:

- adding or training staff in an existing TB microscopy unit so that 2 microscopists use an existing microscope,
- adding a microscope at an existing microscopy unit (if there will be an additional microscopist to use it),
- adding a new TB microscopy unit equipped with a microscope and a microscopist,
- improving transportation of samples to an existing TB microscopy unit,
• identifying and designating a good private laboratory and making it a part of quality assessment, or
• in facilities with a very heavy workload (e.g. large facilities), using a faster microscopy method (fluorescence staining, for which there must be a florescent microscope and trained staff).

If you believe there is a need to increase the capacity of the TB laboratory services, discuss this with the district TB laboratory supervisor. The laboratory supervisor will be interested in your assessment and should mention it when talking with higher level laboratory coordinators who will make decisions about laboratory resources.

STOP

Now do Exercise B – Written Exercise and Discussion

When you have reached this point in the module, you are ready to do Exercise B. Turn to page 25 and follow the instructions for Exercise B.
2. Visit TB microscopy units in the district

Your main objectives when visiting a TB microscopy unit are:

- to verify that all sputum smear-positive TB cases detected by microscopy have been registered for treatment, and
- to verify the accuracy of sputum examination results recorded in the District TB Register.

A *Tuberculosis Laboratory Register* (see next page) is maintained at each TB microscopy unit. It is used to log in all sputum samples sent for examination for TB. The microscopist assigns a laboratory serial number for each patient whose sputum is received for examination. Date of receipt, patient’s name, sex, age, health facility, address, and reason for examination are also recorded. If the examination is for diagnosis, the microscopist ticks under “Diagnosis.” If it is for follow-up, the microscopist records the patient’s District TB number under “Follow-up.” When the sputum examination is completed, the microscopist records the results for each specimen (neg, +, ++, +++ or a number 1–9 if scanty).

2.1. Confirm that all smear-positive TB cases are registered in the District TB Register and that sputum examination results are entered correctly

Since untreated smear-positive TB patients are likely to infect others and have a high death rate, it is very important to make sure all patients with positive sputum results are treated. If these patients have not been registered in the *District TB Register*, they are not receiving treatment for TB, unless perhaps they are being treated by another health-care provider, such as a private provider.

Compare entries in the *Tuberculosis Laboratory Register* and the *District TB Register* to confirm that all patients who had smear-positive results in the *Tuberculosis Laboratory Register* are registered in the *District TB Register*. A significant proportion (up to 5%) of smear-positive patients is lost because they never report back to the health facility for the results of the sputum examination and treatment. Registering every smear-positive case in the *District TB Register* will remind you to urge health facilities to locate any missing patient. You will also be able to determine to what extent patients who do not return for results and treatment are a problem in the district.

A reasonable time period, such as one month, must pass before you can expect to see all smear-positive TB cases in the *Tuberculosis Laboratory Register* registered in the *District TB Register*. It may take one month for sputum examination results to arrive at the health facility, a TB patient to start treatment, and for you to visit the health facility and register the case in the *District TB Register*. Therefore, when you review the *Tuberculosis Laboratory Register*, do not review the most recent month of entries.

To begin your review, turn in the *Tuberculosis Laboratory Register* to the entries dated about one month ago, or the date of your previous visit to the microscopy unit. Draw a line under the last entry made that day. You will review entries from that day and earlier. Then begin reviewing sputum examination results, working backwards through the register. For example, if today is 5 October, turn in the register to find 5 September. Draw a line below the last entry dated 5 September. Then review the entries from 5 September and before, back to the line drawn at your previous visit on about 5 August. (See example on the next page.)
**Example**

**TUBERCULOSIS LABORATORY REGISTER**

<table>
<thead>
<tr>
<th>Lab serial no.</th>
<th>Date</th>
<th>Name (in full)</th>
<th>Sex M/F</th>
<th>Age</th>
<th>Complete address (for new patients)</th>
<th>Name of referring health facility</th>
<th>Reason for examination*</th>
<th>Microscopy results</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1010</td>
<td>4-9</td>
<td>John Mwarena</td>
<td>M</td>
<td>42</td>
<td>15/6 Third St, Chalo</td>
<td>Kanebo HC</td>
<td>✓</td>
<td>neg neg neg</td>
<td></td>
</tr>
<tr>
<td>1011</td>
<td>4-9</td>
<td>Michael Milanzi</td>
<td>M</td>
<td>27</td>
<td>1417 Airport Rd, Kacheka</td>
<td>Kacheka Dist Hosp</td>
<td>✓</td>
<td>neg neg neg</td>
<td></td>
</tr>
<tr>
<td>1012</td>
<td>5-9</td>
<td>Dorothy Thomo</td>
<td>F</td>
<td>33</td>
<td>5 Botha Rd, Chalo</td>
<td>Kacheka Dist Hosp</td>
<td>✓</td>
<td>+ + + + +</td>
<td></td>
</tr>
<tr>
<td>1013</td>
<td>5-9</td>
<td>Krispin Nodisi</td>
<td>M</td>
<td>25</td>
<td>34 Half-Way Tree Rd, Kacheka</td>
<td>Kacheka Dist Hosp</td>
<td>✓</td>
<td>neg neg</td>
<td></td>
</tr>
<tr>
<td>1014</td>
<td>5-9</td>
<td>R.J. Mbuti</td>
<td>M</td>
<td>51</td>
<td>50 Kohima Rd, Kacheka</td>
<td>Dr. F. Lelo</td>
<td>✓</td>
<td>neg neg</td>
<td></td>
</tr>
<tr>
<td>1015</td>
<td>5-9</td>
<td>Leona Koffi</td>
<td>F</td>
<td>24</td>
<td>273 Sangang Rd, Kanebo</td>
<td>Kanebo HC</td>
<td>C-120</td>
<td>+ +</td>
<td></td>
</tr>
<tr>
<td>1016</td>
<td>6-9</td>
<td>Arthur Nadel</td>
<td>M</td>
<td>19</td>
<td>4 Canopus St, Bel Air Village</td>
<td>Puso HC</td>
<td>✓</td>
<td>neg neg</td>
<td></td>
</tr>
<tr>
<td>1017</td>
<td>6-9</td>
<td>Mary Mbay</td>
<td>F</td>
<td>30</td>
<td>1441 Butswalo Rd, Puso</td>
<td>Puso HC</td>
<td>✓</td>
<td>neg neg neg</td>
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<tr>
<td>1018</td>
<td>6-9</td>
<td>J. Karam</td>
<td>M</td>
<td>65</td>
<td>945 N. Market St, Puso</td>
<td>Puso HC</td>
<td>✓</td>
<td>neg +</td>
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<tr>
<td>1019</td>
<td>6-9</td>
<td>Reza Talala</td>
<td>M</td>
<td>21</td>
<td></td>
<td></td>
<td>✓</td>
<td>neg neg neg</td>
<td></td>
</tr>
</tbody>
</table>

* If sputum is for diagnosis, write ✓ in the diagnosis column under Follow-up.

This is the first smear-positive case for diagnosis found in the Tuberculosis Laboratory Register today. The District TB Coordinator will confirm that Dorothy Thomo is registered in the District TB Register.

The Chalo District TB Coordinator is visiting this microscopy unit on 5 October. He found the entries made in the Tuberculosis Laboratory Register one month ago, 5 September. He drew a line above the line and on previous pages until he reaches entries he reviewed at the previous visit (entries through about 5 August).
To review the *Tuberculosis Laboratory Register*:

1. Find the column “Microscopy Results” in the *Tuberculosis Laboratory Register*.

2. Look for smear-positive cases. Look down the column until you find a patient with positive results (2 or more positive smears, that is, 2 or more results recorded as +, ++, +++), or a number 1–9 for scanty). Then look at “Reason for Examination.” If the reason for examination was diagnosis, this is a smear-positive patient who should be registered in the *District TB Register* and receiving treatment.

3. When you find a **smear-positive TB case**, look in the *District TB Register* to check whether the smear-positive patient is registered. Note the patient’s lab serial no. in the *Tuberculosis Laboratory Register*. Then look on the right side of the *District TB Register*, in the column “Before treatment/Lab no.” until you find the matching laboratory serial number.

   **If the patient is found:**
   
   a. Look to the left to find the patient’s name and confirm that it is the same patient.
   
   b. Put a tick next to the patient’s row in the *Tuberculosis Laboratory Register* to designate that the patient is registered in the *District TB Register*.
   
   c. Find the patient’s microscopy results recorded in the *Tuberculosis Laboratory Register*. Three smears should have been examined for diagnosis. Determine the **highest result of the three** sputum samples recorded in the *Tuberculosis Laboratory Register*. The highest result should be recorded in the *District TB Register*.
   
   d. Compare the result recorded in the *District TB Register*. If it does not match the highest result from the *Tuberculosis Laboratory Register*, correct the *District TB Register*.
   
   e. If you correct the *District TB Register*, make a note to check the patient’s *TB Treatment Card* when you return to the patient’s health facility. If there is an error on the *TB Treatment Card*, it must be corrected also. Inform the health facility staff about the error and ask them to give more attention to correct transcribing.

   **If the patient is not found** in the *District TB Register*:
   
   a. Register the patient now. Copy the patient’s information from the *Tuberculosis Laboratory Register*, including the patient’s laboratory serial number, date of sputum smear examination, name, sex, age, address, referring health facility, and the microscopy results. (You will not be able to enter the type of patient until the patient is found.)
   
   b. Make a note that this patient must be found and put on treatment. Plan to visit the referring health facility to check the health facility records.

   When you go to that health facility at your next supervisory visit, you may find that the patient has begun treatment since your previous visit and now has a *TB Treatment Card*. If so, use the *TB Treatment Card* to complete the row in the
District TB Register by adding the type of patient, date treatment started, and treatment category.

However, if you find that the patient has not started treatment, the patient must be found. Inform the health worker responsible for TB control about this case. If the patient is never found to begin treatment, record the type of patient as “Other.”

4. If you find a TB suspect in the Tuberculosis Laboratory Register who has only one sputum result that is positive for diagnosis:
   a. Write down the information on this patient.
   b. Plan to visit the referring health facility to determine whether the patient continued the diagnostic process, and the result. A patient with one positive sputum examination result should have been referred to a clinician, so that the clinician can make a clinical assessment of whether the patient has TB or do other tests.

   When you go to the referring facility at your next supervisory visit, find out whether the patient was referred to a clinician for assessment. If the patient was diagnosed with TB, be sure the patient is registered in the District TB Register and confirm that treatment has started. If treatment has not begun, or if the diagnostic process was not continued, ask the health worker to find the patient.

5. Continue reviewing entries in the Tuberculosis Laboratory Register to find all the smear-positive TB cases diagnosed, and confirm that they are registered in the District TB Register. Smear-positive TB cases that you have previously confirmed to be registered will have a tick by their row. Continue working backwards through the Tuberculosis Laboratory Register until you reach TB cases that you ticked at a previous visit.

STOP

Now do Exercise C – Written Exercise

When you have reached this point in the module, you are ready to do Exercise C. Turn to page 27 and follow the instructions. Do this exercise by yourself. Then discuss your answers with a facilitator.
2.2 Confirm sputum examination results from a sample of follow-up sputum examinations

From the *Tuberculosis Laboratory Register*, select a sample of patients that had follow-up sputum examinations since your previous visit, and confirm the laboratory results recorded in the *District TB Register*. To select a sample of up to 5 cases, go back 30 days from today in the *Tuberculosis Laboratory Register*. Look in the column “Reason for Examination,” and working backwards through the register, select up to 5 TB patients who had follow-up sputum examinations. See the example on the next page.

a. When you find a TB patient in the *Tuberculosis Laboratory Register* whose reason for examination was follow-up, note the patient’s District TB number (recorded in that column). Also note the highest result of the two sputum samples.

b. Look at the left side of the *District TB Register* until you find the patient’s District TB number. Confirm that the patient’s name is the same.

c. Check that the highest result from the *Tuberculosis Laboratory Register* is accurately recorded in the *District TB Register*. If not, correct the *District TB Register*.

d. Repeat these steps until you have confirmed the sputum examination results from several follow-up sputum examinations.

If you correct the *District TB Register*, make a note to check the patient’s *TB Treatment Card* when you return to the patient’s health facility. If there is an error on the *TB Treatment Card*, it must be corrected also.
<table>
<thead>
<tr>
<th>Lab serial no.</th>
<th>Name (in full)</th>
<th>Age</th>
<th>Complete address (for new patients)</th>
<th>Name of referring health facility</th>
<th>Reason for examination</th>
<th>Microscope</th>
</tr>
</thead>
<tbody>
<tr>
<td>876 13-5</td>
<td>Josef Perin</td>
<td>21</td>
<td>Agrville</td>
<td>Hoap</td>
<td>V</td>
<td>neg</td>
</tr>
<tr>
<td>877 13-5</td>
<td>Mei Ling</td>
<td>30</td>
<td>Centre St. Tea Stall</td>
<td>Agrville Hosp</td>
<td>F-169</td>
<td>neg</td>
</tr>
<tr>
<td>878 13-5</td>
<td>Franz Dabis</td>
<td>35</td>
<td>61 Cemetery Rd</td>
<td>Agrville Hosp</td>
<td>F-16 neg</td>
<td>neg neg</td>
</tr>
<tr>
<td>879 13-5</td>
<td>Marcel Prada</td>
<td>25</td>
<td>Gordon St. &amp; Long St.</td>
<td>Agrville Hosp</td>
<td>v</td>
<td>neg neg neg</td>
</tr>
<tr>
<td>880 13-5</td>
<td>Flora Mariner</td>
<td>71</td>
<td>Tower Road Apt 45</td>
<td>Agrville</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Beginning one month before today and working backwards from there, find a smear examination done for follow-up. Note the patient's District TB number (F-66) and name (Franz Dabis). Also note the results.

b. On the District TB Register find the patient's District TB number (F-66) and then check that the name is the same (Franz Dabis).

c. Then check that the highest of the two results is accurately recorded. It is, for Franz.

d. Repeat these steps until you have confirmed laboratory results from several follow-up sputum examinations.
2.3 **Review the *Tuberculosis Laboratory Register* to identify problems**

Although your main purpose for looking at the *Tuberculosis Laboratory Register* is to check the *District TB Register*, you may notice entries that cause you to suspect a problem with performance at the TB microscopy unit or health facilities. Below are some items that you may notice in the *Tuberculosis Laboratory Register* and the implications.

<table>
<thead>
<tr>
<th>You may suspect a problem if:</th>
<th>Implications:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The <em>Tuberculosis Laboratory Register</em> is not filled out completely and correctly.</td>
<td>The microscopist may need training or may need reinforcement from the laboratory supervisor.</td>
</tr>
<tr>
<td>Some TB suspects did not have 3 samples examined for diagnosis.</td>
<td>The microscopist may choose not to process the third sputum sample because the previous two were positive.</td>
</tr>
<tr>
<td>Some TB patients did not have 2 samples examined for follow-up.</td>
<td>Health workers may not know the correct number of sputum samples to collect, or the patients do not return with the second sample. You can address this with staff at the health facilities.</td>
</tr>
<tr>
<td>Every TB suspect has provided 3 samples for diagnosis, and every TB patient has provided 2 samples for follow-up.</td>
<td>This is uncommon. It is possible that the microscopist is preparing the required number of smears from fewer samples.</td>
</tr>
<tr>
<td>The proportion of positive results of each type (+++, ++, +, scanty) is not as expected, e.g. there are no “++” or “scanty” results.</td>
<td>There may be a problem with the performance of the microscopist. The microscopist may not look closely enough, or there may be a new microscopist who needs some guidance. The microscopist may repeat the first result without reading the other samples. The laboratory supervisor should review the work.</td>
</tr>
<tr>
<td>The proportions of positive results of each type change (e.g. no scanty, too many scanty).</td>
<td>Check that slides are kept and periodically rechecked for quality by the supervisory laboratory, and that feedback is provided to the microscopist.</td>
</tr>
<tr>
<td>For a particular case, the results are not reasonable, (for example, one result is +++ and the two others are negative).</td>
<td>If all samples have some bacilli, the immersion oil may have become contaminated with bacilli, or slides could be scratched, or the lens could be contaminated.</td>
</tr>
<tr>
<td>The result of all smears for a patient is the same. (The expected result is higher positivity for the second, overnight sample.)</td>
<td></td>
</tr>
<tr>
<td>The laboratory is rejecting samples because of contamination by containers that have leaked.</td>
<td>There may be a need to train health facility workers how to close the containers tightly, or the programme may need to use different containers.</td>
</tr>
</tbody>
</table>
You may suspect a problem if:

<table>
<thead>
<tr>
<th></th>
<th>Implications:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The total workload (number of</td>
<td>If more than 20 smears are examined per day per microscopist (or more than 100</td>
</tr>
<tr>
<td>sputum smears examined) in a</td>
<td>per week), visual fatigue will lead to a deterioration of reading quality.</td>
</tr>
<tr>
<td>day for diagnosis and follow-up</td>
<td>Capacity of the TB laboratory services may need to be increased.</td>
</tr>
<tr>
<td>seems too large.</td>
<td>If a microscopist reads fewer than 10–15 smears per week, proficiency in</td>
</tr>
<tr>
<td></td>
<td>reading smears cannot be maintained.</td>
</tr>
<tr>
<td>The number of sputum smears</td>
<td>Discuss either of these problems with the laboratory supervisor.</td>
</tr>
<tr>
<td>examined in an average week by</td>
<td></td>
</tr>
<tr>
<td>one microscopist seems too</td>
<td></td>
</tr>
<tr>
<td>small.</td>
<td></td>
</tr>
</tbody>
</table>

As the District TB Coordinator, you are NOT the laboratory supervisor and have no direct authority there. If you suspect any problems with performance at a TB microscopy unit, you should inform the district laboratory supervisor so that the situation can be investigated.

2.4 Use laboratory data to assess how health facilities are identifying TB suspects

If health facilities do not have Registers of TB Suspects, use the Tuberculosis Laboratory Register to do a quick assessment of how staff are identifying TB suspects at health facilities.

Count entries in the Tuberculosis Laboratory Register to determine for one month:

- What was the number of TB suspects who had sputum examined for diagnosis in a month?
- How many of these were smear-positive?

Then calculate to determine:

- What proportion of TB suspects tested were smear-positive?

The proportion of TB suspects tested who are smear-positive is usually 2–10%. If more than 15% are smear-positive, persons with more advanced disease are being selected for sputum examination, i.e. severe cases with long delay in diagnosis, instead of all people with cough for 2 weeks or more. Discuss this problem with the officer in charge at the health facility to decide the probable cause and a solution.

An increase in case detection efforts should be reflected in more sputum smear examinations per month and a lower positivity rate.

2.5 Check whether microscopists keep slides for quality assurance by the provincial laboratory supervisor

Microscopists should keep slides so that they can be reviewed by a laboratory supervisor at the provincial level for quality assurance. The provincial supervisor should periodically check for quality of the slide preparation and the accuracy of reading on both positive and negative slides, and should then send feedback to the technician.
Talk with the microscopist to find out whether slides are kept for review by the provincial laboratory supervisor. Ask:

- Do you keep the slides of all smear-positive TB cases? Do you keep negative slides?
- Where are the slides stored?
- How long do you keep slides?
- Have you been asked to send slides to the provincial TB laboratory, or has someone come here to collect or check your slides?
- If you send slides to the provincial TB laboratory, do you send all slides or do you send a sample? If a sample, how do you choose the sample?
- Did you receive a response? What was it? (___% discrepancy on negatives and ___% discrepancy on positives.)

2.6 Check equipment and supplies at the TB microscopy unit

During your visit, observe and ask the microscopist questions about the microscope and supplies.

Assess whether a microscope is in good working condition by asking the microscopist whether it works well mechanically so that it can focus. Ask if he or she can see well through it.

To assess whether reagents and other supplies needed in the TB microscopy unit are available in needed quantities, ask the microscopist. Needed supplies include:

- reagents: carbol fuchsin, methylene blue, alcohol (methanol), sulfuric acid
- immersion oil
- running water
- other materials: slides, boxes to store slides, sputum containers (if patients come to the laboratory to collect sputum)
- electricity or sunlight (depends on type of microscope).

Report to the district laboratory supervisor any laboratory equipment or supply needs noted during your visit.

2.7 Check whether the TB microscopy unit has trained staff

Ask the microscopist about his or her training. Microscopists working in TB microscopy units at health facilities or the district hospital should be trained in the following procedures:

- collection, storage, and transport of sputum samples for microscopy
- smear preparation
- slide reading
- reporting of results and recording of data in the *Tuberculosis Laboratory Register*
- storage of positive slides and negative slides for quality assurance
• Safety measures for handling sputum samples and performing microscopy (including disinfection of table and hands; ventilation; discarding used materials).

Ask the microscopist how he or she was trained to prepare and read TB slides. Laboratory technicians who have a background in basic laboratory skills require 1 week (5 full days) of practical training to learn to prepare and read TB slides. An individual who has not previously had formal laboratory training can be trained to do sputum microscopy but will require longer training, at least 2 weeks.

3. Keep notes of items to follow up after visits to TB microscopy units

Keep a list of items to check at various health facilities, based on your findings at the TB microscopy units. This would include:

• any smear-positive TB patients who were just found in the *Tuberculosis Laboratory Register* and entered in the *District TB Register*, but who may not have started treatment (You will need to confirm that they start treatment. Then you will use their *TB Treatment Cards* to complete the entries in the *District TB Register*.)

• any TB suspects who had one positive sputum result (to confirm that they continued diagnostic process) and

• any patients who had incorrect sputum examination results (for diagnosis or follow-up) recorded in the *District TB Register* when compared with the *Tuberculosis Laboratory Register*, so that you can correct their *TB Treatment Card*.

If you identified any problems or concerns on your visit to TB microscopy units, such as a faulty or broken microscope, or a microscopist who was not sufficiently trained, plan to communicate your important observations to the district TB laboratory supervisor. When you discuss your observations, collaborate with the laboratory supervisor as needed to help solve the problems.
Summary of important points

- A TB microscopy unit is a site that performs sputum smear microscopy for diagnosis of TB suspects and follow-up of TB patients in treatment. Sputum samples should be processed and results reported within 24 hours of receipt at the laboratory.

- To assess whether there are sufficient TB laboratory services in the district, consider:
  - whether every health facility that provides TB control services has reasonable access to a TB microscopy unit,
  - the overall microscopy workload in the district, and
  - the distribution of the microscopy workload among TB microscopy units.

- At each TB microscopy unit, compare entries in the *Tuberculosis Laboratory Register* and the *District TB Register* to verify completeness and accuracy. For each TB suspect with positive sputum examination results in the *Tuberculosis Laboratory Register*, confirm that the patient is registered in the *District TB Register*.
  - If the patient is *found* in the *District TB Register*, tick next to the patient’s row in the *Tuberculosis Laboratory Register*. Also confirm that the highest result of the three sputum samples is recorded correctly in the *District TB Register*.

  - If the patient is *not found* in the *District TB Register*, register the patient immediately. When you visit the referring health facility later, determine whether the patient has begun treatment. If not, inform the health worker responsible for TB control that this patient must be found and put on treatment. If the patient cannot be found and does not begin treatment, register the type of patient as “Other.”

  - If a patient has only one sputum result that is positive (for diagnosis), write down information on the patient so that you can check later at the referring health facility whether the patient was referred to a clinician for diagnosis.

- Review the *Tuberculosis Laboratory Register* for entries that cause you to suspect some problem with performance at the TB microscopy unit or by staff at health facilities.

- Confirm the following items and inform the district laboratory supervisor of any needs:
  - Microscopists keep both negative and positive sputum slides for quality review by the provincial laboratory supervisor.
  - The microscope is in good working condition, and reagents and other supplies are sufficient.
  - TB microscopy unit staff are trained.

- A significant proportion (up to 5%) of smear-positive patients are lost because they never report back to the health facility for the results of the sputum examination and begin treatment. Registering these patients in the *District TB Register* helps to ensure that the health facility will be urged to locate them. It also shows to what extent patients who do not return for results and treatment are a problem in the district.

- Keep notes of items to check at your next supervisory visit to various health facilities, based on your findings at the TB microscopy units.
Self-assessment questions

Answer the self-assessment questions below to check what you have learned. Then compare your answers with those on page 22.

1. A TB microscopy unit should prepare and read sputum slides and record and return the results to the referring health facility within ______ hours of receipt.

2. If a microscopist reads too many sputum smears per day (more than _____ per day), quality is likely to suffer because of _______________________________________.
   
   If a microscopist reads too few sputum smears per week (fewer than __________ per week), quality is likely to suffer because of ___________________________________.

3. There were 1 625 sputum examinations performed in a district in a month at two microscopy units. The City Hospital TB microscopy unit has two microscopes and 3 microscopists. They performed 1 200 sputum examinations last month.
   
The Rain Forest Health Centre has one microscope and 1 microscopist. He performed 425 sputum examinations last month.
   
a) How many sputum examinations were performed per microscopist per day at City Hospital TB microscopy unit?

b) How many sputum examinations were performed per day by the microscopist at the Rain Forest Health Centre?

   c) Is there a problem with the size of the workload or the distribution of the workload between the two TB microscopy units?

4. A District TB Coordinator found a TB suspect who has smear-positive results in the Tuberculosis Laboratory Register but 6 weeks later was not in the District TB Register.

   a) The District TB Coordinator should: (tick all answers that are correct)

   _____ Just write down the TB suspect’s name and address on a piece of paper to check on later.
   _____ Register the TB case in the District TB Register.
b) At the next visit to the referring health facility, the District TB Coordinator found that the TB case has no TB Treatment Card and has not started treatment. The health worker says that they went to the TB suspect’s home and found that he had moved. The TB suspect is lost. The District TB Coordinator should: (tick all correct answers)

- Record in the District TB Register that the type of patient is “Other.”
- Cross out the entry for this lost TB suspect in the District TB Register.

5. The sputum examination results for Don Ho Lin in the Tuberculosis Laboratory Register are ++, +++ , ++. In the District TB Register, the results are recorded as shown below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Result</th>
<th>Lab No.</th>
<th>Date</th>
<th>Res.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/9</td>
<td>++</td>
<td>1624</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27/10</td>
<td>+</td>
<td>1580</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Is this correct? If not, correct the entry above.

6. The TB microscopist at the Rain Forest Health Centre said that he was running low on reagents and slides and that his microscope is difficult to focus. What should the District TB Coordinator do?

Now compare your answers with those on the next page.
Answers to self-assessment questions

If you had difficulty answering any question, turn back and study the section indicated (in parentheses). If you do not understand something, discuss it with a facilitator.

1. A TB microscopy unit should prepare and read sputum slides and record and return the results to the referring health facility within 24 hours of receipt. (See section 1.1)

2. If a microscopist reads too many sputum smears per day (more than 20 per day), quality is likely to suffer because of visual fatigue. (See section 1.3)

   If a microscopist reads too few sputum smears per week (fewer than 10–15 per week), quality is likely to suffer because of lack of practice. (See section 1.3)

3. a) \[
\frac{1200 \text{ examinations in a month}}{22 \text{ workdays in a month}} = \frac{55 \text{ examinations per day}}{3 \text{ microscopists}}
\]

   b) \[
\frac{425 \text{ examinations}}{22 \text{ workdays}} = 19 \text{ examinations per day}
\]

   c) There is no problem with the workload or the distribution between the microscopy units since at both units the microscopists read between 2 and 20 slides per day. (See section 1.4)

4. a) __Register the TB case in the District TB Register.__

   b) __Record in the District TB Register that the type of patient is “Other.” (See section 2.1.1)

5. The entry is not correct. The highest result should be recorded in the District TB Register. It should be changed to ++++. (See section 2.1.1)

6. The District TB Coordinator should report these needs to the district laboratory supervisor. (See section 2.5)

The End

Congratulations on finishing this module!
Exercises for Module F:

Laboratory Support for TB
Exercise A
Written Exercise – Assessing access to TB microscopy units

In this exercise you will assess whether the health facilities in Faba District have access to a TB microscopy unit.

Find the map of Faba District in your module B: Faba District. Examine the map. Then write answers to the questions below.

1. Where is sputum microscopy performed in Faba District?

2. What factors should be considered when deciding whether a facility has access to a TB microscopy unit?

3. Do all health facilities that currently provide TB control services in Faba District have access to a TB microscopy unit?

4. If Emeral Health Post began offering TB control services, would it have access to a TB microscopy unit? Why or why not?

When you have finished this exercise, review your answers with a facilitator.

When you have finished this exercise, GO BACK to page 4 and read until the next stop sign (page 7).
In this exercise you will calculate the average number of sputum smear examinations performed by each TB microscopy unit per day in Faba District, in order to assess whether there is a need to increase the capacity of the TB laboratory services. If so, you will suggest possible ways to improve the situation.

1. **Read the following information about the TB laboratory services in Faba District:**

   There is currently only one TB microscopy unit in the district, and that is at the Agraville Hospital laboratory. There is one microscope, and there are 2 trained microscopists who perform multiple hospital laboratory functions. The more senior of these was recently appointed as district laboratory supervisor. The district laboratory supervisor reviews slide for quality assurance, provides back-up, and performs other laboratory functions, so he will no longer read sputum smears. The other microscopist principally does sputum smears.

   It is May 2004. The District TB Coordinator is meeting with the district TB laboratory supervisor, who has brought the laboratory records. These records show that the TB microscopy unit at Agraville Hospital performed 1,960 sputum smear examinations during the first quarter of 2004.

2. **Complete the steps below to calculate the average number of sputum smear examinations performed per microscopist per day.**

   a) How many workdays are in a quarter?

   b) Calculate the number of smear examinations performed per day by the microscopist:

   \[
   \frac{1,960 \text{ smear examinations performed}}{66 \text{ workdays}} = \text{examinations per day per microscopist}
   \]
3. **Write answers to the following questions.**

   a) What is the maximum recommended number of sputum examinations per microscopist per day?

   b) What is the minimum recommended number per day?

   c) Based on your calculations for the first quarter of 2004, is the TB microscopy workload too high at the Agraville Hospital laboratory?

   d) Think about the plans you have read for Faba District. Review the highlights of plans for 2004 on page 5 of module B: *Faba District*. Do you think the microscopy workload will increase or decrease later in 2004 and 2005?

   e) What would you suggest as possible ways to improve the capacity of the TB laboratory support in Faba District?

```
When you have finished this exercise, review your answers with a facilitator.
```

```
When the group has finished this discussion, GO BACK to page 7 and read until the next stop sign (page 11).
```
Exercise C

Written Exercise – Confirming registration of all smear-positive cases in the District TB Register

In this exercise you will check that all smear-positive cases recorded in the Tuberculosis Laboratory Register at the microscopy unit at Agraville Hospital are registered in the District TB Register. You will also confirm that the sputum examination results were correctly recorded. You will list any patients to check on during your next supervisory visits to health facilities.

You will use module L: Tuberculosis Laboratory Register in this exercise. That module contains pages from the Tuberculosis Laboratory Register from 12 April through 8 July 2004, the date of the visit to Agraville Hospital described below. The relevant pages of the District TB Register for this exercise are included on pages 30–34 of this module.

1. Read the following information about today’s supervisory visit to Agraville Hospital.

Dr Oke Karimi, the District TB Coordinator, is visiting Agraville Hospital on 8 July. This morning he visited the health worker responsible for TB case detection and treatment in the outpatient unit. There, he reviewed all the current TB Treatment Cards and added the new cases to the District TB Register (District TB numbers F-129 to F-138 with date of registration 8/7). See the cases that he registered today in the District TB Register on page 33 of this module.

Dr Karimi has now gone down the hall to visit the microscopy unit at the Agraville Hospital laboratory. In the microscopy unit, he should review the Tuberculosis Laboratory Register and confirm that all smear-positive cases detected by the microscopy unit have been registered in the District TB Register.

Because a reasonable time must elapse after sputum examination to allow time for the TB patients to start treatment and for them to be registered in the District TB Register, Dr Karimi should not review the most recent month of entries in the Tuberculosis Laboratory Register. Since his previous visit to the microscopy unit was on 3 June, Dr Karimi should review entries in the Tuberculosis Laboratory Register made on 3 June and previously, that is, entries from about 3 June working backwards to 6 May (the date of the May visit to Agraville Hospital).

2. Pretend that you are Dr Karimi. Confirm that all smear-positive cases that were detected by sputum examination before your previous visit have been registered in the District TB Register. Follow the directions on the next page.

(You may review the more detailed instructions on how to locate all smear-positive cases and confirm that they are registered on pages 10–11 of this module if needed.)

Exercise continued on next page
a) Open module L: *Tuberculosis Laboratory Register* from Agrville Hospital microscopy unit to the entries made today, 8 July. Do not review the most recent month of entries. Turn backwards in the register to 3 June. Draw a line under the last entry made on 3 June.

b) Begin reviewing entries above that line, working **backwards** through the *Tuberculosis Laboratory Register*. Find each smear-positive case by looking in the column “Microscopy results” for smear-positive cases. If the reason for examination is **diagnosis**, this is a smear-positive patient who should be registered in the *District TB Register* and receiving treatment.

c) When you find a **smear-positive case**:

- turn to the *District TB Register* (provided on pages 30–34) and find the case, using laboratory serial number and patient’s name, to confirm that the case has been registered there,
- place a **tick** next to the case in the *Tuberculosis Laboratory Register* to indicate that the case has been registered, and
- confirm that the highest of the laboratory results was correctly recorded in the *District TB Register*. (If there was a mistake, correct it on the *District TB Register*.)

d) If you find a smear-positive case that has **not** yet been registered:

- **add it to the District TB Register**, 
- place a **tick** next to the case in the *Tuberculosis Laboratory Register* to indicate that the case has been registered, and
- make a note to determine when you visit the referring health facility whether this case has begun treatment and, if not, to ask the health worker to find the patient.

e) If you find a TB suspect who has only one sputum result that is positive for diagnosis:

- write down the information on the patient, and
- make a note to determine when you visit the referring facility whether this case has continued the diagnostic process, and the result.

f) Continue reviewing entries in the *Tuberculosis Laboratory Register* to find all the smear-positive TB cases and confirm that they are registered in the *District TB Register*. Continue working backwards until you reach TB cases that Dr Karimi ticked (to show that he confirmed registration) at a previous visit (6 May). (Stop at number 836.)
3. Note in the space below any cases to follow-up on, such as cases to check whether they have begun treatment or have continued the diagnostic process:

4. When will you check whether smear-positive TB cases detected by the microscopy unit on 5 and 6 July are registered in the *District TB Register*?

When you have finished this exercise, review your answers with a facilitator.

Then **GO BACK** to page 11. Read to the end of the module (page 22).
Note: Preceding pages from the District TB Register are not included here. Registrations of all cases on those pages were confirmed by Dr Karimi at previous visits to the Agraville Hospital microscopy unit.

---

**2nd Qtr. 2004**

**DISTRICT TUBERCULOSIS REGISTER – LEFT SIDE OF THE REGISTER BOOK**

<table>
<thead>
<tr>
<th>Date of Registration</th>
<th>District TB No.</th>
<th>Name</th>
<th>Sex</th>
<th>M/F</th>
<th>Age</th>
<th>Complete Address</th>
<th>Health Facility</th>
<th>Date Treatment Started</th>
<th>Treatment Category</th>
<th>Disease Site EP/N</th>
<th>Type of Patient**</th>
</tr>
</thead>
<tbody>
<tr>
<td>27-5</td>
<td>F-106</td>
<td>Mano Tann</td>
<td>M</td>
<td>38</td>
<td>Denali Village</td>
<td>Denali HP</td>
<td>18-5</td>
<td>I</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-107</td>
<td>Rose Nabawe</td>
<td>F</td>
<td>26</td>
<td>56 Memorial Drive, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>14-5</td>
<td>III</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-108</td>
<td>Rachel Meza</td>
<td>M</td>
<td>31</td>
<td>Cross St. Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>17-5</td>
<td>II</td>
<td>P</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-109</td>
<td>Vincent Dondero</td>
<td>M</td>
<td>20</td>
<td>Centre St at North, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>18-5</td>
<td>I</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-110</td>
<td>Imran Shah</td>
<td>M</td>
<td>30</td>
<td>near cemetery, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>20-5</td>
<td>I</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-111</td>
<td>Andrew Grand</td>
<td>M</td>
<td>40</td>
<td>68 Lickston Way, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>20-5</td>
<td>I</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-112</td>
<td>L.G. Amador</td>
<td>M</td>
<td>34</td>
<td>2nd St. Cheese Shop Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>24-5</td>
<td>III</td>
<td>EP</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-113</td>
<td>Karina Ello</td>
<td>F</td>
<td>33</td>
<td>Town Park Flower shop, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>26-5</td>
<td>I</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3-6</td>
<td>F-114</td>
<td>Micah Ello</td>
<td>M</td>
<td>10</td>
<td>Town Park flower shop, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>26-5</td>
<td>II</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>7-6</td>
<td>F-115</td>
<td>Catherine Nunez</td>
<td>F</td>
<td>27</td>
<td>8 Garden St, Agraville Hosp</td>
<td>Agraville Hosp</td>
<td>28-5</td>
<td>III</td>
<td>P</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

*Enter the treatment category:
CAT I: New smear-positive case, or
New case (seriously ill smear-negative or seriously ill EP), e.g. 2(HRZE)/4(HR)
CAT II: Re-treatment, e.g.
2(HRZE)/1HR2ZE5/HR)/E5
CAT III: New case (smear-negative or EP), e.g.
2(HRZE)/4(HR)

**Enter only one code:
N: New – A patient who has never had treatment for TB or who has taken anti-TB drugs for less than 1 month
R: Relapse – A patient previously treated for TB who has been declared cured or treatment completed, and is diagnosed with bacteriologically positive (smear or culture) TB
F: Treatment after failure – A patient who is started on a re-treatment regimen after having failed previous treatment
D: Treatment after default – A patient who returns to treatment, positive bacteriologically, following interruption of treatment for 2 months or more
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O: Others – All cases that do not fit the above definitions. (This group includes chronic cases, a patient who is sputum positive at the end of a re-treatment regimen.)

† CAT I patients have follow-up sputum examination at 2 months; CAT II patients have follow-up sputum examination at 3 m
<table>
<thead>
<tr>
<th>Date of Registration</th>
<th>District TB No.</th>
<th>Name</th>
<th>Sex</th>
<th>Age</th>
<th>Complete Address</th>
<th>Health Facility</th>
<th>Date Treatment Started</th>
<th>Treatment Category*</th>
<th>Disease Site</th>
<th>R</th>
<th>F</th>
<th>D</th>
<th>T</th>
<th>O</th>
<th>Type of Patient**</th>
</tr>
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<tr>
<td>3-6</td>
<td>F-116</td>
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<td>33</td>
<td>Market St. Alley, Agrawille</td>
<td>Agrawille Hosp</td>
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<tr>
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<td>F</td>
<td>26</td>
<td>Irini Rd, Agrawille</td>
<td>Agrawille Hosp</td>
<td>1-6</td>
<td>I</td>
<td>P</td>
<td>N</td>
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<tr>
<td>3-6</td>
<td>F-118</td>
<td>Than Van Tra</td>
<td>M</td>
<td>43</td>
<td>48 Park St, Agrawille</td>
<td>Agrawille Hosp</td>
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<tr>
<td>10-6</td>
<td>F-119</td>
<td>Ella Wana</td>
<td>F</td>
<td>28</td>
<td>Behind Tea Stall, Bella Village</td>
<td>Bella Hc</td>
<td>31-5</td>
<td>I</td>
<td>P</td>
<td>N</td>
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<tr>
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<td>F-120</td>
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<td>M</td>
<td>29</td>
<td>Creek Path, Bella Village</td>
<td>Bella Hc</td>
<td>24-5</td>
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<td>25</td>
<td>Brook Farm near Bella Village</td>
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<td>II</td>
<td>P</td>
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<td>Lucy Wana</td>
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<td>Behind tea stall Bella Village</td>
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<td>F-123</td>
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<td>10-6</td>
<td>F-124</td>
<td>Salim Kuga</td>
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<td>34</td>
<td>Bicycle Lanz, Bella Village</td>
<td>Bella Hc</td>
<td>3-6</td>
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<td>P</td>
<td>N</td>
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<td>10-6</td>
<td>F-125</td>
<td>Rashid Jamu</td>
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<td>Bella Village near Bakery</td>
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<td>7-6</td>
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<td>P</td>
<td>N</td>
<td></td>
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</tr>
</tbody>
</table>

*Enter the treatment category:
CAT I: New smear-positive case, or New case (seriously ill smear-negative or seriously ill EP), e.g. 2(9RZE)4(HR),
CAT II: Re-treatment, e.g. 2(HRE)2(9RZE)2(HR),
CAT III: New case (smear-negative or EP), e.g. 2(HR)2(9RZE)2(HR).

**Enter only one code:
N: New — A patient who has never had treatment for TB or who has taken anti-TB drugs for less than 1 month
R: Relapse — A patient previously treated for TB who has been declared cured or treatment completed, and is diagnosed with bacteriologically positive (smear or culture) 1st
P: Treatment after failure — A patient who is started on a re-treatment regimen after having failed previous treatment
F: Treatment after default — A patient who returns to treatment, positive bacteriologically, following interruption of treatment for 2 months or more
T: Transfer in — A patient who has been transferred from another TB register to continue treatment
D: Other — All cases that do not fit the above definitions. (This group includes chronic case, a patient who is sputum-positive at the end of a re-treatment regimen.)

‡ CAT I patients have follow-up sputum examination at 2 months; CAT II patients have follow-up sputum examination at 31

Exercise continued on next page
**DISTRICT TUBERCULOSIS REGISTER – LEFT SIDE OF THE REGISTER BOOK**

<table>
<thead>
<tr>
<th>Date of Registration</th>
<th>District TB No.</th>
<th>Name</th>
<th>Sex</th>
<th>Age</th>
<th>Complete Address</th>
<th>Health Facility</th>
<th>Date Treatment Started</th>
<th>Treatment Category*</th>
<th>Disease Site</th>
<th>Type of Patient**</th>
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<tr>
<td>10-10</td>
<td>F-126</td>
<td>Ahmed Makandu</td>
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<td>High Village</td>
<td>High Rd HP</td>
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<td>N R F D T O</td>
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<td>Felicity Kala</td>
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<td>Irini Road near Gadare Village</td>
<td>Gadare HP</td>
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<td>24-10</td>
<td>F-128</td>
<td>Carlo Turone</td>
<td>M</td>
<td>22</td>
<td>Denali Village</td>
<td>Denali HP</td>
<td>14-10</td>
<td>I P N</td>
<td>N R F D T O</td>
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</tbody>
</table>

**Enter the treatment category:**

CAT I: New smear-positive case, or New case (seriously ill smear-negative or seriously ill EP), e.g. 2(HRZE)/4(HR)

CAT II: Re-treatment, e.g. 2(HRZE)5/1(HRZE)/5(RH)

CAT III: New case (smear-negative or EP), e.g. 2(HRZ)/4(HR)

**Enter only one code:**

N: New – A patient who has never had treatment for TB or who has taken anti-TB drugs for less than 1 month
R: Relapse – A patient previously treated for TB who has been declared cured or treatment completed, and is diagnosed with bacteriologically positive (smear or culture) TB
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† CAT I patients have follow-up sputum examination at 2 months; CAT II patients have follow-up sputum examination at 3 m

<table>
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<th>Result</th>
<th>Lab No.</th>
<th>Date</th>
<th>Res.</th>
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<td>Date of Registration</td>
<td>District TB No.</td>
<td>Name</td>
<td>Sex</td>
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<td>Ruth Lani</td>
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<td>Neke Ufere</td>
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<td>Juli Yang</td>
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<td>Jun Swandu</td>
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<td>Malina Kindo</td>
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<td>8 - 7</td>
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<td>Wahid Kindo</td>
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<td>F-138</td>
<td>Maurice Hoda</td>
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</table>

*Enter the treatment category:
CAT I: New smear-positive case, or
New case (seriously ill smear-negative or seriously ill EP), e.g. 2(HRZE)4(HR).
CAT II: Re-treatment, e.g.
2(HRZE)3Y1HRZE5Y(HR)E3
CAT III: New case (smear-negative or EP), e.g.
2(HRZ)4(HR).

**Enter only one code:
N: New—A patient who has never had treatment for TB or who has taken anti-TB drugs for less than 1 month
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† CAT I patients have follow-up sputum examination at 2 months; CAT II patients have follow-up sputum examination at 3 months.

Exercise continued on next page
# District Tuberculosis Register – Left Side of the Register Book

<table>
<thead>
<tr>
<th>Date of Registration</th>
<th>District TB No.</th>
<th>Name</th>
<th>Sex</th>
<th>Age</th>
<th>Complete Address</th>
<th>Health Facility</th>
<th>Date Treatment Started</th>
<th>Treatment Category*</th>
<th>Disease Site P/EP</th>
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</tbody>
</table>

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CAT II: Re-treatment, e.g.
2(HRZE)4(HRZE)5(HR)E,

CAT III: New case (smear-negative or EP), e.g.
2(HRZ)4(HR),

**Enter only one code:

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† CAT I patients have follow-up sputum examination at 2 months. CAT II patients have follow-up sputum examination at 3 months.
Annex

Request for Sputum Examination

Tuberculosis Laboratory Register
TB LABORATORY FORM
REQUEST FOR SPUTUM EXAMINATION

Name of health facility ____________________________     Date _________________
Name of patient ________________________________      Age ______  Sex: M ☐ F ☐
Complete address __________________________________________________________________________
___________________________________________________________________________________________
District _______________

Reason for examination:
Diagnosis ☐  TB Suspect No. ________________
OR  Follow-up ☐  Patient’s District TB No.* ________________

Disease site:   Pulmonary ☐  Extrapulmonary ☐ (specify)______________

Number of sputum samples sent with this form _____
Date of collection of first sample ___________ Signature of specimen collector ____________

* Be sure to enter the patient’s District TB No. for follow-up of patients on TB treatment.

RESULTS (to be completed by Laboratory)

Lab. Serial No. ____________________________

(a) Visual appearance of sputum:

- Mucopurulent ☐
- Blood-stained ☐
- Saliva ☐

(b) Microscopy:

<table>
<thead>
<tr>
<th>DATE</th>
<th>SPECIMEN</th>
<th>RESULTS</th>
<th>POSITIVE (GRADING)</th>
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<td></td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>+</td>
<td>scanty (1–9)</td>
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</table>

Date _______  Examined by (Signature) __________________________________

The completed form (with results) should be sent to the health facility and to the District Tuberculosis Unit.
### TUBERCULOSIS LABORATORY REGISTER

<table>
<thead>
<tr>
<th>Lab serial no.</th>
<th>Date</th>
<th>Name (in full)</th>
<th>Sex M/F</th>
<th>Age</th>
<th>Complete address (for new patients)</th>
<th>Name of referring health facility</th>
<th>Reason for examination&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Microscopy results</th>
<th>Remarks</th>
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<td></td>
<td></td>
<td>Diagnosis</td>
<td>Follow-up</td>
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</tbody>
</table>

<sup>a</sup> If sputum is for diagnosis, write a tick under Diagnosis. If sputum is for follow-up, write the patient’s District TB number under Follow-up.