MULTIDRUG-RESISTANT TUBERCULOSIS (MDR-TB) INDICATORS

A minimum set of indicators for the programmatic management of MDR-TB in national tuberculosis control programmes

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MDR-TB INDICATORS

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The indicators are grouped into four classes :

1. Detection
2. Enrolment
3. Interim results
4. Final outcomes

Abbreviations:

ART :	antiretroviral therapy
DST :	drug susceptibility testing
HIV :	human immune deficiency virus
MDR/MDR-TB :	multidrug-resistant tuberculosis; resistance to at least isoniazid and rifampicin
TB :	tuberculosis
XDR/XDR-TB :	extensively drug-resistant tuberculosis; MDR with additional resistance to a fluoroquinolone and a second-line injectable (amikacin, kanamycin, or capreomycin) anti-TB medication

1. Detection

Rationale

Drug susceptibility tests (DST) for rifampicin and isoniazid are indicated in patients suspected to harbour drug-resistant TB strains. Early detection of resistance is intended to ensure an appropriate drug regimen from the start and presumably increase likelihood of success and allay amplification of resistance patterns. Limited resources usually mean that DST is reserved for patients considered at increased risk of drug resistance. Groups to be targeted for DST vary by national policy but usually include patients who have been previously treated but failed a first or a subsequent course of TB medication. Contacts of confirmed MDR-TB patients, and in some settings patients with HIV-associated TB, are also often tested. DST for fluoroquinolones and second-line injectable anti-TB medication is important in MDR case management. The four indicators for detection measure the access of TB patients to DST. The delay in testing and the frequency of MDR among individuals in different risk categories is also evaluated. The importance of these parameters for the programme manager is that they calculate how the targeting and timeliness of DST, as well as the yield of MDR cases, vary by the risk category of the patient targeted.

The period of assessment is six calendar months. This is usually counted from January to end June and July to end December. Indicators are measured three months after the end of the six-month period. All data can be extracted from the basic TB register and treatment card and the laboratory register for culture and DST.

Calculation

1) TB patients with result for isoniazid and rifampicin DST

Numerator: Number of TB cases with DST result for both isoniazid and rifampicin by each risk category in the national policy during the period of assessment.

Denominator: Number of TB cases identified in each respective risk category during the period of assessment.

2) Confirmed MDR-TB cases detected among TB patients tested for isoniazid and rifampicin DST

Numerator: Number of confirmed MDR-TB cases by each risk category in the national policy during the period of assessment.

Denominator: Number of TB cases in each respective risk category with DST result for both isoniazid and rifampicin during the period of assessment.

These two indicators are to be calculated for all cases tested and as many risk categories as exist in the national policy.

3) Confirmed MDR-TB cases tested for susceptibility to fluoroquinolone and second-line injectable

Numerator: Number of confirmed MDR-TB cases tested for susceptibility to a fluoroquinolone and a second-line injectable anti-TB medication during the period of assessment.

Denominator: Number of confirmed MDR-TB cases during the period of assessment.

4) Delay in diagnosis of MDR-TB

Definition: The duration in days between the date when the TB patient was identified as being in a risk category as per the national policy and the date of the DST results for isoniazid and rifampicin as recorded in the laboratory register. The first date is determined by type of risk category. It may correspond to when TB is diagnosed if universal DST is practised, or when a laboratory result indicates treatment failure or persistent sputum smear positivity during a course of TB treatment, or when HIV-associated TB is detected, or, in the case of a contact with TB, when the laboratory confirms MDR in the index case.

The calculation is done on all cases with DST results for isoniazid and rifampicin (sensitive or resistant) entered in the laboratory register during the six-month period of assessment. The indicator is expressed as the arithmetic mean number of days with the minimum and maximum ranges for all episodes included in the calculation. The number of episodes included in the calculation should be indicated.

2. Enrolment

Rationale

The programme manager is responsible to ensure that all patients in whom MDR-TB is suspected or detected are placed on appropriate treatment in the shortest time possible. Early detection of resistance is intended to ensure a correct drug regimen from the start and lower risks of further amplification of drug resistance. Four minimum indicators have been identified to assess the pattern of enrolment of TB patients on second-line drug treatment, including that among children and females. An additional stratification for HIV-positive MDR-TB patients assesses the proportion of them on antiretroviral treatment (ART). Confirmed XDR-TB patients should be put on adequate medication. A comparison of enrolled to identified MDR-TB cases gives an indication of access to care albeit that patients started on treatment may have been detected prior to the period of assessment.

This period is six calendar months, usually counted from January to end June and July to end December. Indicators are measured in the month following the end of the six-month period. All data can be extracted from the MDR-TB treatment register and the laboratory register for culture and DST.

Calculation

1) MDR-TB cases (suspected or confirmed) enrolled on MDR-TB treatment

Definition: Number of MDR-TB cases (suspected or confirmed) registered and started on a prescribed MDR-TB treatment regimen during the period of assessment.

Comparator: Number of MDR-TB cases (suspected or confirmed) eligible for second-line drugs treatment during the period of assessment.

This indicator is computed for (i) all cases, (ii) cases aged < 15 y, and (iii) females.

2) Confirmed MDR-TB cases enrolled on MDR-TB treatment regimen

Definition: Number of confirmed MDR-TB cases registered and started on a prescribed MDR-TB treatment regimen during the period of assessment.

Comparator: Number of confirmed MDR-TB cases detected during the period of assessment.

This indicator is computed for (i) all cases, (ii) cases with HIV on ART, and (iii) cases with HIV but not known to be on ART

3) Confirmed XDR-TB cases enrolled on XDR-TB treatment regimen

Definition: Number of confirmed XDR-TB cases registered and started on a prescribed XDR-TB treatment regimen during the period of assessment.

Comparator: Number of confirmed XDR-TB cases detected during the period of assessment.

4) Delay in start of MDR-TB treatment

Definition: The duration in days between the date of MDR confirmation (DST results showing resistance to both isoniazid and rifampicin in the MDR-treatment register) and the date when the patient started a prescribed second-line drug regimen as per the MDR-treatment register.

The calculation is done on all confirmed MDR-TB cases recorded on the MDR-treatment register during the six-month period of assessment. The indicator is expressed as the arithmetic mean number of days with the minimum and maximum ranges for all episodes included in the calculation. If treatment was started before the confirmatory DST was reported then the delay is marked as zero days. The number of episodes included in the calculation should be indicated.

3. Interim results

Rationale

Treatment for MDR-TB typically takes two years or more. The programme manager often needs an indication of how patients are faring well before final outcomes can be assessed, typically two to three years after the start of enrolment. This is particularly important when a drug-resistant TB treatment programme starts. Assessing culture conversion (for confirmed pulmonary cases) and death by six months is widely used as a proxy of final outcomes. Information on defaulting by 6 months is helpful. It is also useful to know how many patients started on second-line drugs for MDR turned out not to be MDR. And likewise for XDR. This evaluates the effectiveness of the treatment algorithm in reserving treatment for patients who really need it and avoiding a potentially toxic regimen in patients who do not.

The period of assessment is three calendar months (quarter), usually counted from January to end March, April to end June, July to end September and October to end December. All patients registered and starting treatment during the period of assessment are included in the calculation. Indicators are measured nine months after the end of the quarter of assessment. This gives sufficient time for culture results at month 6 to be issued and retrieved. All data can be extracted from the MDR-TB treatment register.

Calculation

1) MDR-TB cases on MDR-TB treatment regimen with negative culture by six months

Numerator: Number of confirmed pulmonary MDR-TB cases registered and started on a prescribed MDR-TB treatment with negative results for culture during month 6 of their treatment.

Denominator: Number of confirmed MDR-TB cases registered and started on treatment for MDR-TB during the period of assessment.

2) MDR-TB cases on MDR-TB treatment regimen who died by six months

Numerator: Number of confirmed MDR-TB cases registered and started on a prescribed MDR-TB treatment who died of any cause by the end of month 6 of their treatment.

Denominator: Number of confirmed MDR-TB cases registered and started on treatment for MDR-TB during the period of assessment.

3) MDR-TB cases on MDR-TB treatment regimen who defaulted by six months

Numerator: Number of confirmed MDR-TB cases registered and started on a prescribed MDR-TB treatment who defaulted by the end of month 6 of their treatment

Denominator: Number of confirmed MDR-TB cases registered and started on treatment for MDR-TB during the period of assessment

The first indicator would only apply to pulmonary cases. To simplify, the denominator for all indicators is all cases started on treatment. The three indicators should include XDR-TB cases started on prescribed