GLOBAL TB PROGRAMME

Updated interim critical concentrations for first-line and second-line DST (as of May 2012)

World Health Organization

Drug group[a]	Drug	DST method available	DST critical concentrations (µg/ml)			
			Löwenstein-Jensen[b]	Middlebrook 7H10[b]	Middlebrook 7H11[b]	MGIT960
Group 1 First-line oral anti-TB agents	Isoniazid Rifampicin[c] Ethambutol[d] Pyrazinamide	Solid, liquid Solid, liquid Solid, liquid Liquid	0.2 40.0 2.0 -	0.2 1.0 5.0 -	0.2 1.0 7.5 -	0.1 1.0 5.0 100.0
Group 2 Injectable anti-TB agents	Streptomycin[e] Kanamycin Amikacin Capreomycin	Solid, liquid Solid, liquid Solid, liquid Solid, liquid	4.0 30.0 30.0 40.0	2.0 5.0 4.0 4.0	2.0 6.0 - -	1.0 2.5 1.0 2.5
Group 3 Fluoroquinolones	Ofloxacin[f] Levofloxacin Moxifloxacin[g] Gatifloxacin[h]	Solid, liquid Solid, liquid Solid, liquid Solid	4.0 - - -	2.0 1.0 0.5/2.0 1.0	2.0 - - -	2.0 1.5 0.5/2.0 -
Group 4[i] Oral bacteriostatic second-line anti-TB agents	Ethionamide Prothionamide Cycloserine *P*-aminosalicylic acid	Solid, liquid Solid, liquid Solid Solid, liquid	40.0 40.0 30.0 1.0	5.0 - - 2.0	10.0 - - 8.0	5.0 2.5 - 4.0
Group 5[i] Antituberculosis agents with unclear efficacy (not recommended by WHO for routine use in MDR-TB patients)	Clofazimine Amoxicillin/clavulanate Clarithromycin Linezolid	Liquid None None Liquid	- - - -	- - - -	- - - -	- - - 1.0

[a] WHO *Guidelines for the programmatic management of drug-resistant tuberculosis*.
[b] Indirect proportion method recommended. Other solid media methods (resistance ratio) have not been adequately validated for second-line drugs. Concentrations for the absolute concentration method were not evaluated.
[c] Rifampicin borderline resistance more frequently missed by MGIT. Prevalence and geographical distribution of borderline resistance not clear, final LJ interpretations should be made after 6 weeks
[d] Ethambutol 5ug/ml in MGIT is not equivalent to other methods. Ethambutol testing in 7H11 not equivalent to 7H10. There is insufficient evidence to recommend a change in concentration for any method
[e] Streptomycin has a bimodal distribution of MIC values. Insufficient evidence to recommend a change.
[f] Ofloxacin concentration in LJ media increased to 4.0ug/ml. Insufficient data to extrapolate change in 7H10 or 7H11 methods.
[g] Moxifloxacin. Two concentrations proposed. In programmes using both ofloxacin/levofloxacin and moxifloxacin , possible testing is for moxifloxacin only at both concentrations OR test ofloxacin/levofloxacin and moxifloxacin at higher concentration. In programmes using ofloxacin/levofloxacin only test only these drugs. In programmes using only moxifloxacin test at higher concentration of moxifloxacin only.
[h] Gatifloxacin only to be used in exceptional circumstances.
[i] Routine DST for group 4 and 5 drugs is not recommended. Linezolid suitable for testing in MGIT only.