

Drug resistance profiles among patients enrolled in a cohort study of TB in Lima, Perú

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Background and Setting

- Drug resistance prevalence was studied in a TB transmission cohort study between 2009 and 2012 in 81 clinics in Lima. DSTs were performed using the conventional proportion method in LJ and PZA resistance was performed using Wayne method in Dubos media.

Results

- Of 4,499 patients; 3,183 (73.1%) were CU[+] and 3,109 (97.7%) had complete DST results
- Resistance to at least one drug was detected in 1,007 (32.4%)
- 360 (11.6%) had MDR-TB and 173 (48.1%) were PZA^R.
- STR^R was found in 784 (25%) and 264 (33.7%) were MDR.
- INH^R without RIF^R occurred in 249 (8%)
- 174 (70%) of non-MDR INH^R isolates also were STR^R.
- RIF^R without INH^R, occurred in only 39 (1.3%).
- 195 patients were PZA^R and 173 (89.7%) were MDR.

Type of resistance	N	%
Pan-susceptible	2102	67.6
Any-resistant	1007	32.4
Resistant to 1 drug	442 (14.2)	S(74%) H(15%) R(7%)
Resistant to 2 drugs	211 (6.8)	SH(72%) RH(15%)
Resistant to 3 drugs	164 (5.3)	HRS(52%) HRZ(26%)
Resistant to 4 drugs	100 (3.2)	HRSZ(44%) HRSE(56%)
Resistant to All drugs	78	2.5 [7.7 in any resist]

Table 1: Distribution of resistance in total samples with DST results (N=3109)

Associated resist with MDR	N	% [% in MDR]
Any MDR	360	11.6
MDR only	31	1.0 [8.6]
MDR + 1 other 1st-line drug	142	4.6 [39.4]
MDR + 2 other 1st-line drugs	109	3.5 [30.2]
MDR + 3 other 1st-line drugs	78	2.5 [21.7]

Table 2: Distribution of multi-drug resistance in total samples with DST results (N=3109)

Results, continued:

- STR^R was found in 784 (25%) and 264 (33.7%) were MDR
- 174 (70%) of non-MDR INH^R isolates also were STR^R
- Univariate analysis showed that living in Eastern Lima results in a risk for developing TB that is 1.31 times that of living in Central Lima:

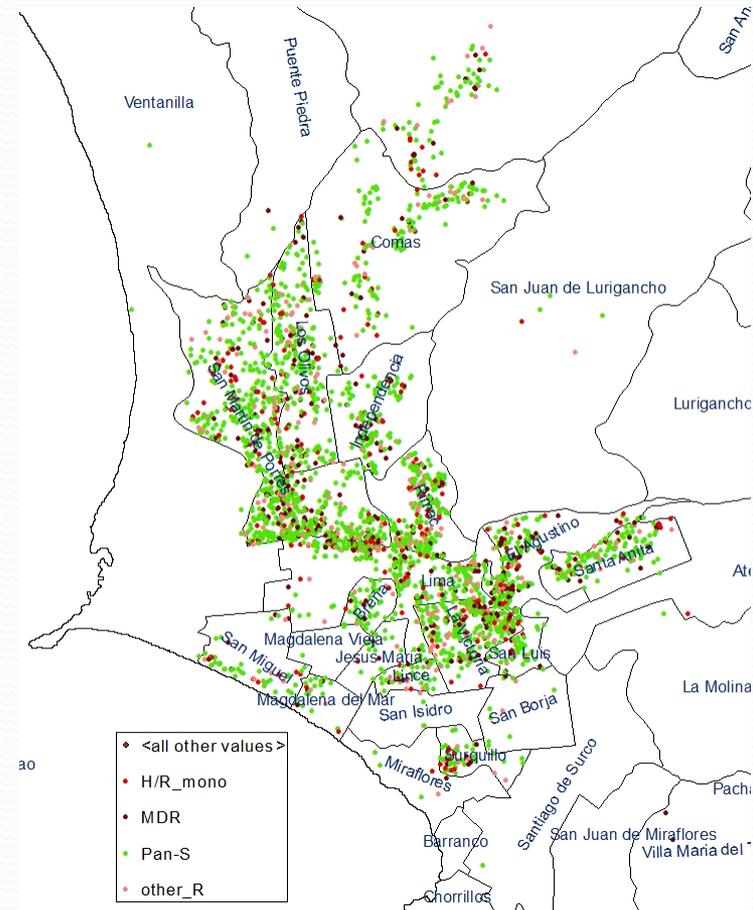
Table 3: Univariate analysis of resistance and MDR in two high incidence settings in Lima

Risk Factor	OR (95% CI)	Central	Eastern
Prior treatment and Any Resistance	1.72	1.62	2.50
	1.4 - 2.1	1.3 - 2.0	1.5 - 4.2
Prior treatment and MDR	3.03	3.00	3.28
	2.4 - 3.9	2.3 - 3.9	1.8 - 6.1

Discussion

- 2010 WHO Global Report on surveillance and response showed that in Peru, more than 20% of drug resistance is primary and 40% is acquired. For MDRTB, >5% is primary resistance and 23% is acquired.
- In comparison, this study shows alarming levels of primary, acquired and multidrug resistance in Lima.
- Results show slightly more drug resistance than WHO Report and differences in risk across regions in Lima.

Map of resistance profiles across Lima



Conclusions and recommendations

- This work shows an important MDR-TB burden amidst declining overall TB rates in Lima.
- The continued elevated prevalence of streptomycin resistance, despite a significant decline in exposure, warrants further investigation.
- In light of the high prevalence of MDR-TB, DST for second-line drugs is important in order to develop appropriate treatment regimens.
- Genotypic testing can further inform regimen development through detection of within- (or between-) class cross resistance.

