

Multidrug-Resistant TB in Georgia - a review

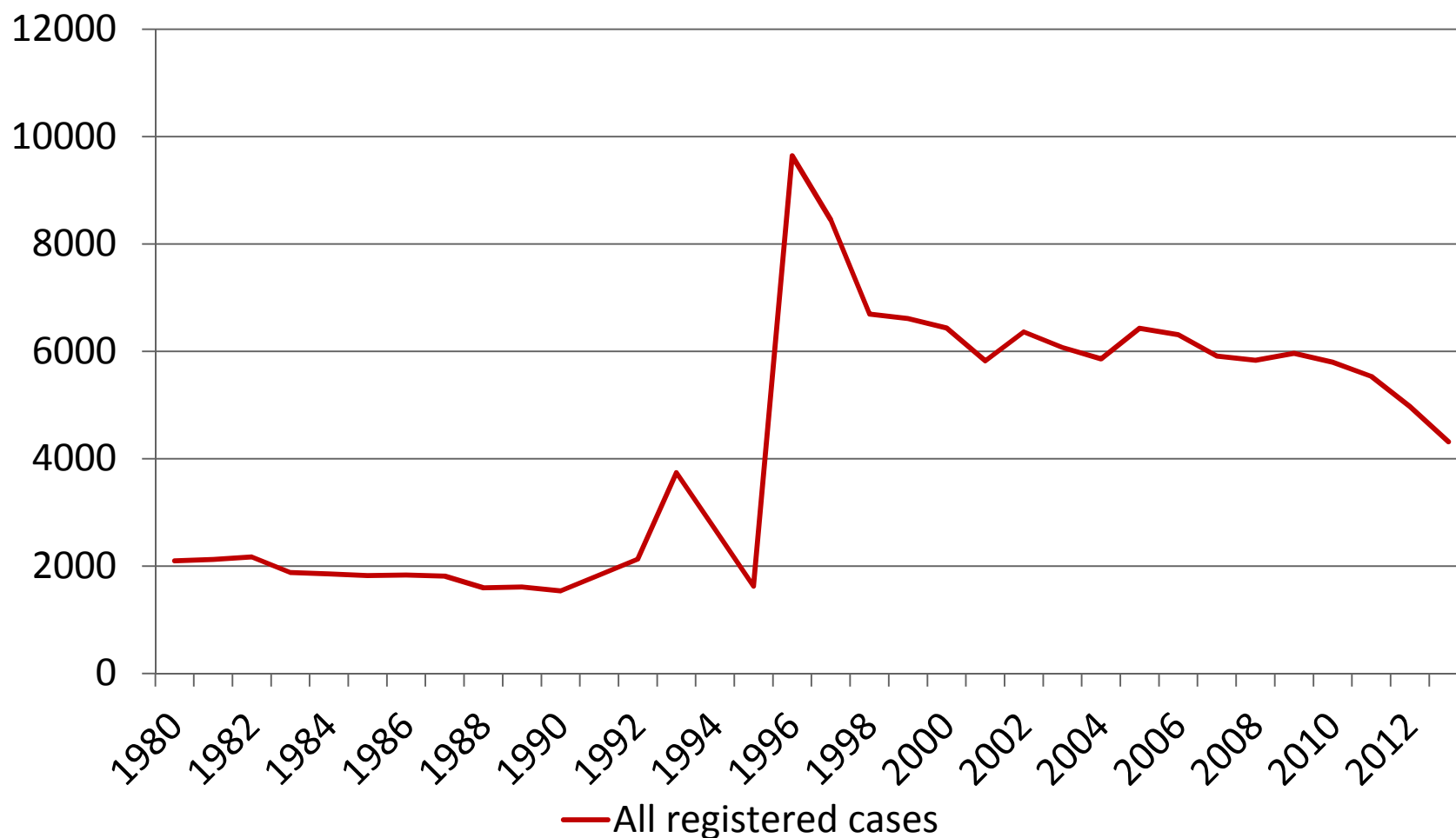


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Tbilisi, Georgia, 2015

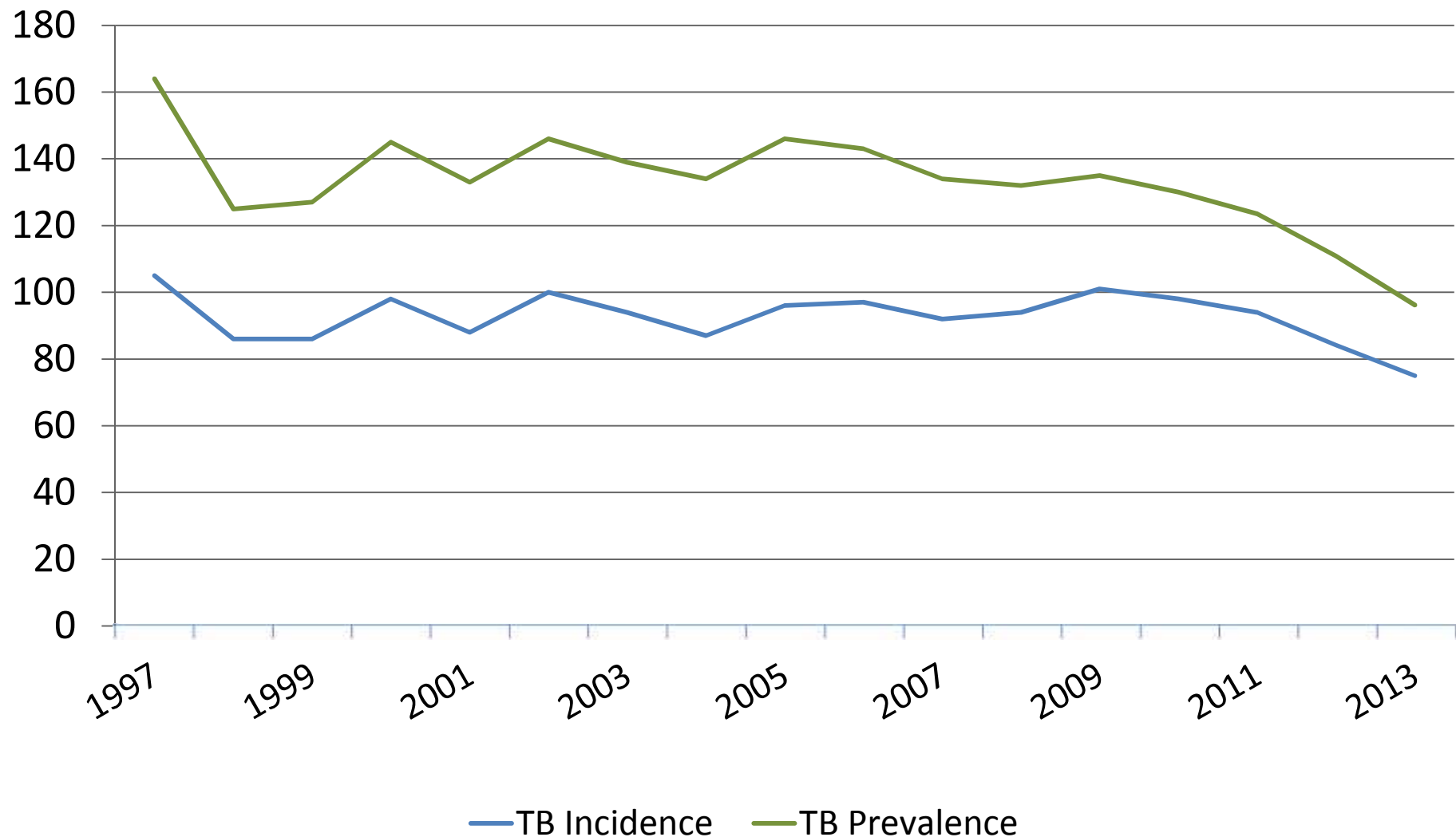


- Territory 69,700sq.km;
- Borders with Russia, Azerbaijan, Armenia, Turkey

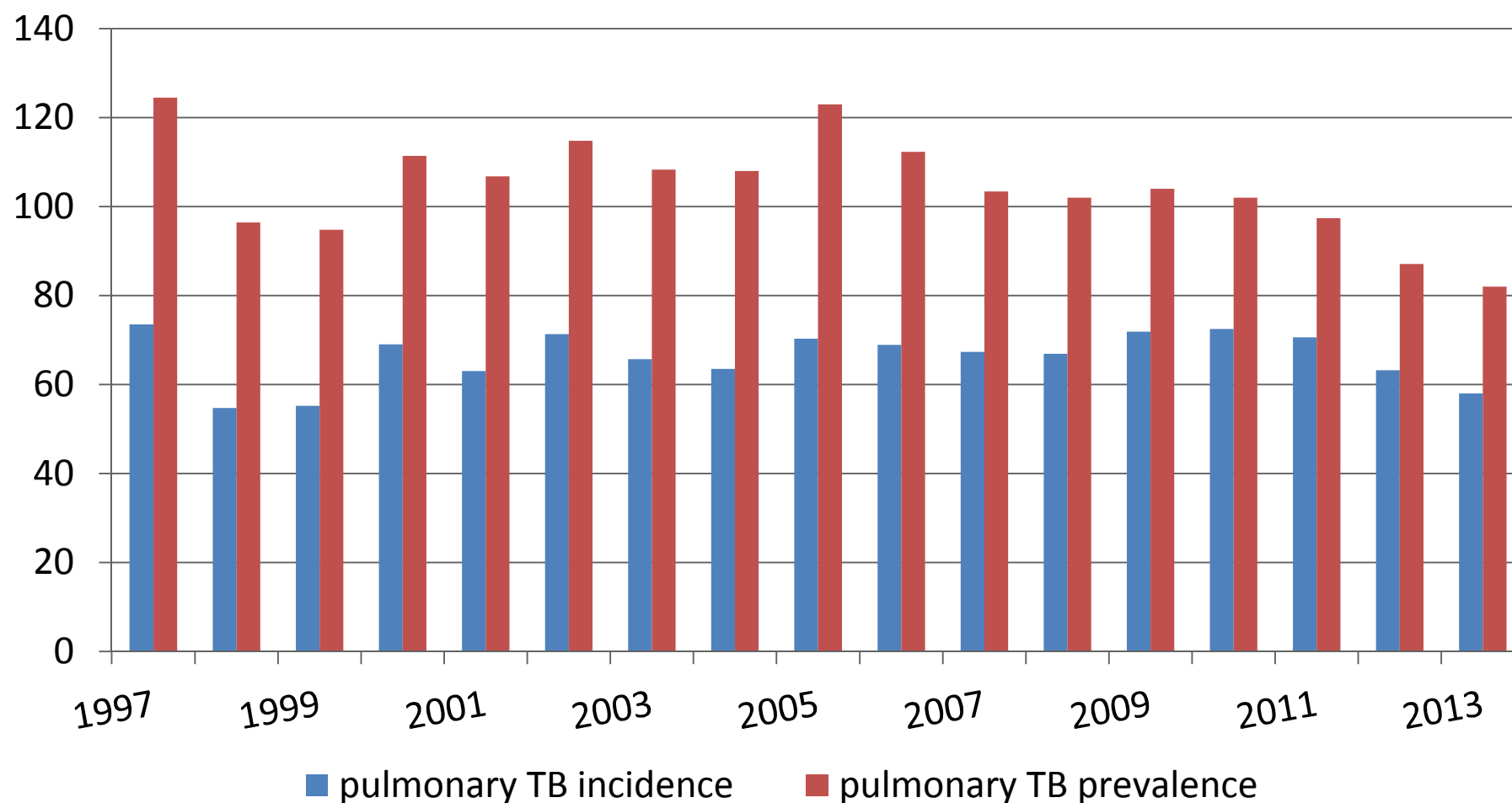
TB cases notification, Georgia 1980-2013 (WHO)



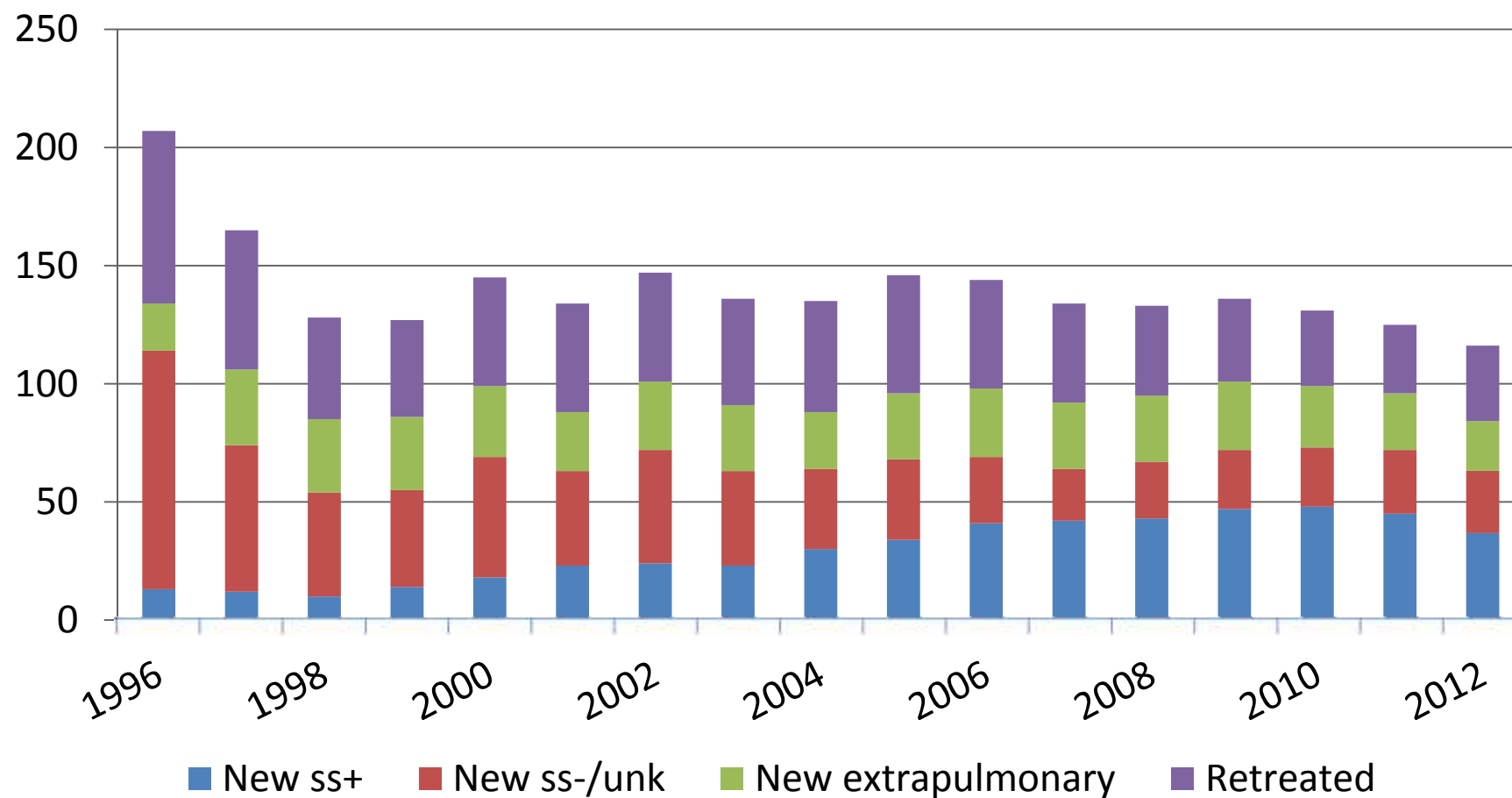
Incidence and Prevalence of TB in Georgia 1997-2013 (per 100,000 population)



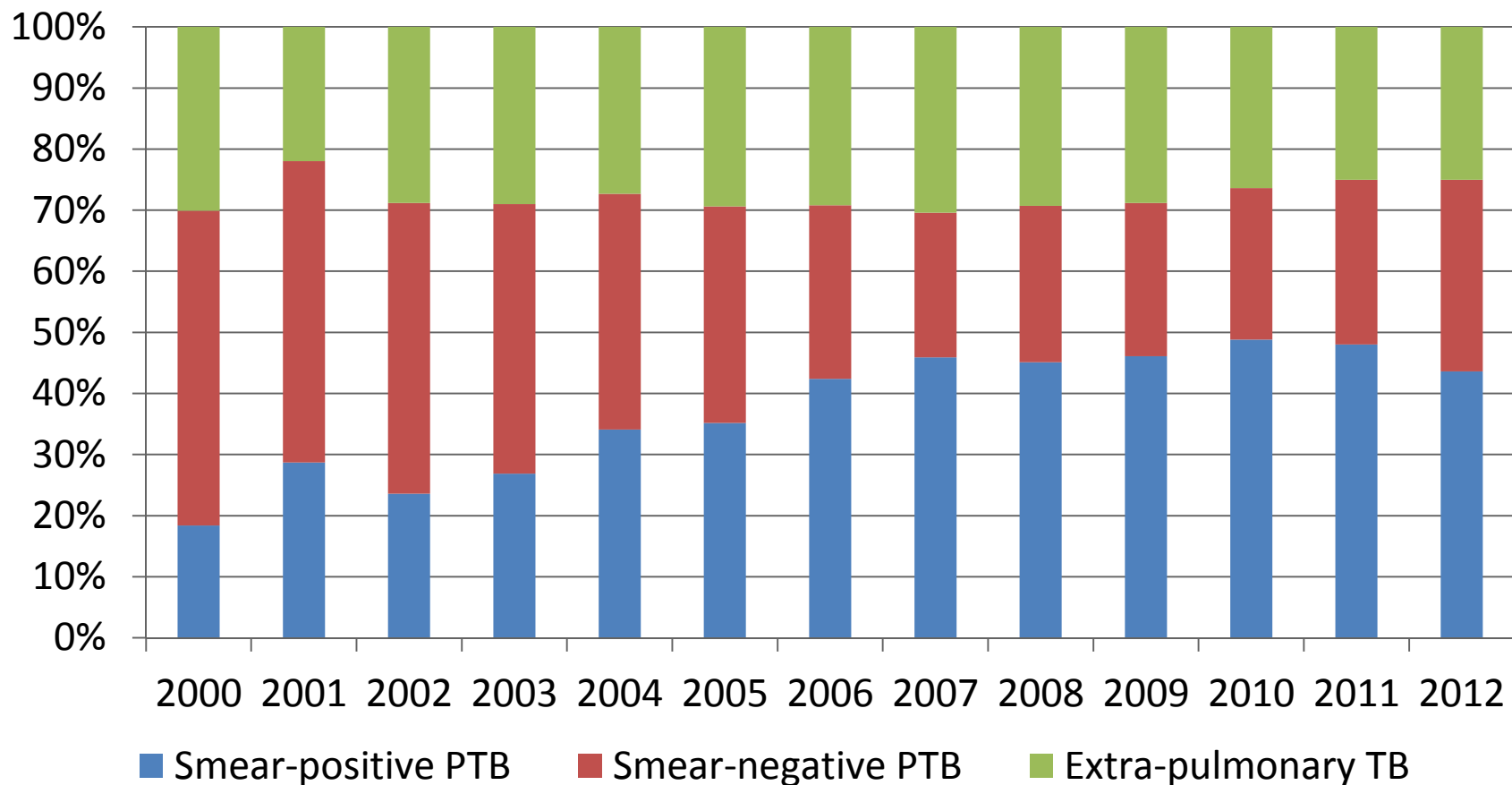
Incidence and Prevalence of Pulmonary TB in Georgia, 1996-2013 (per 100,000 population)



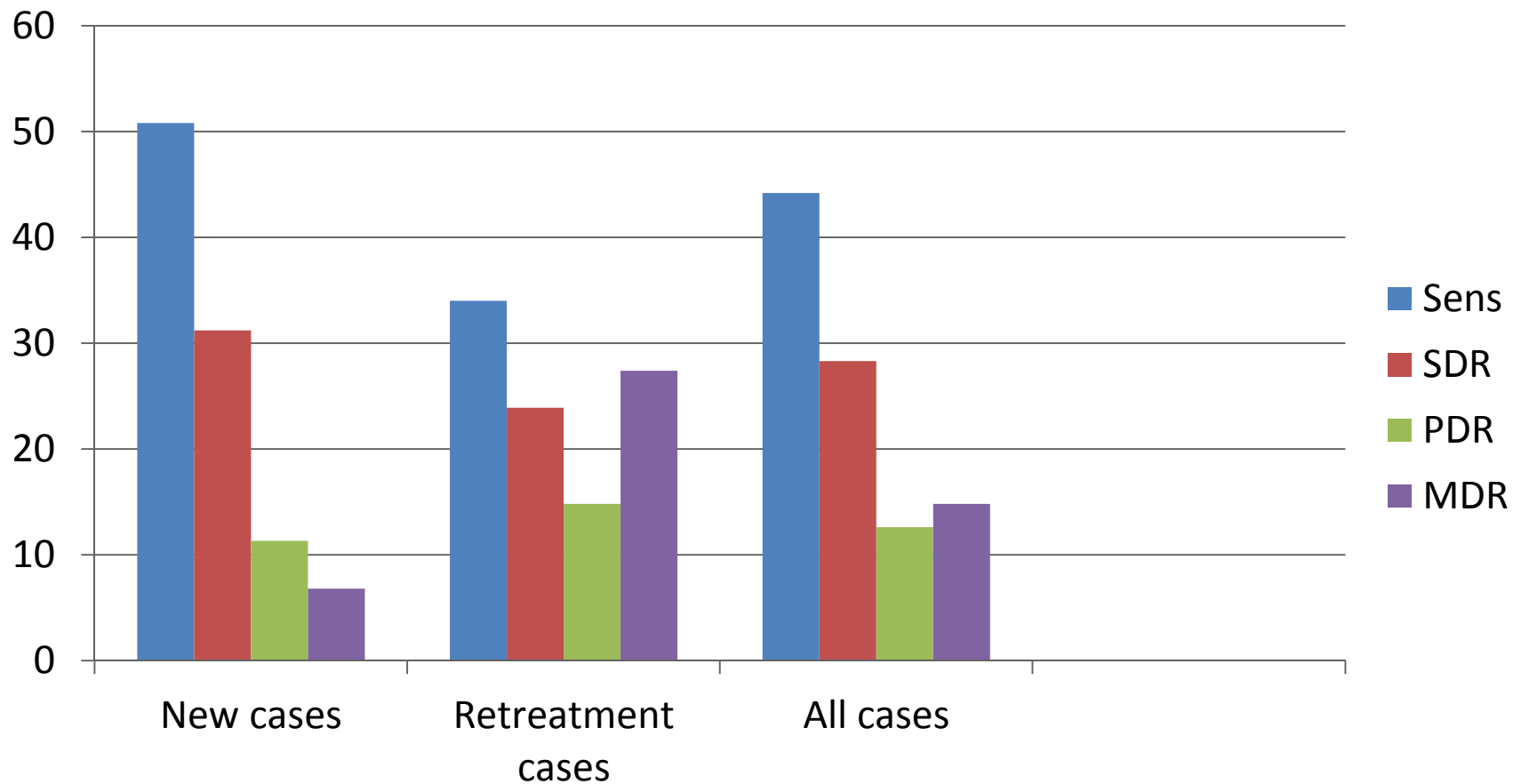
Case Notification rates in Georgia 1996-2012 (per 100,000 population)



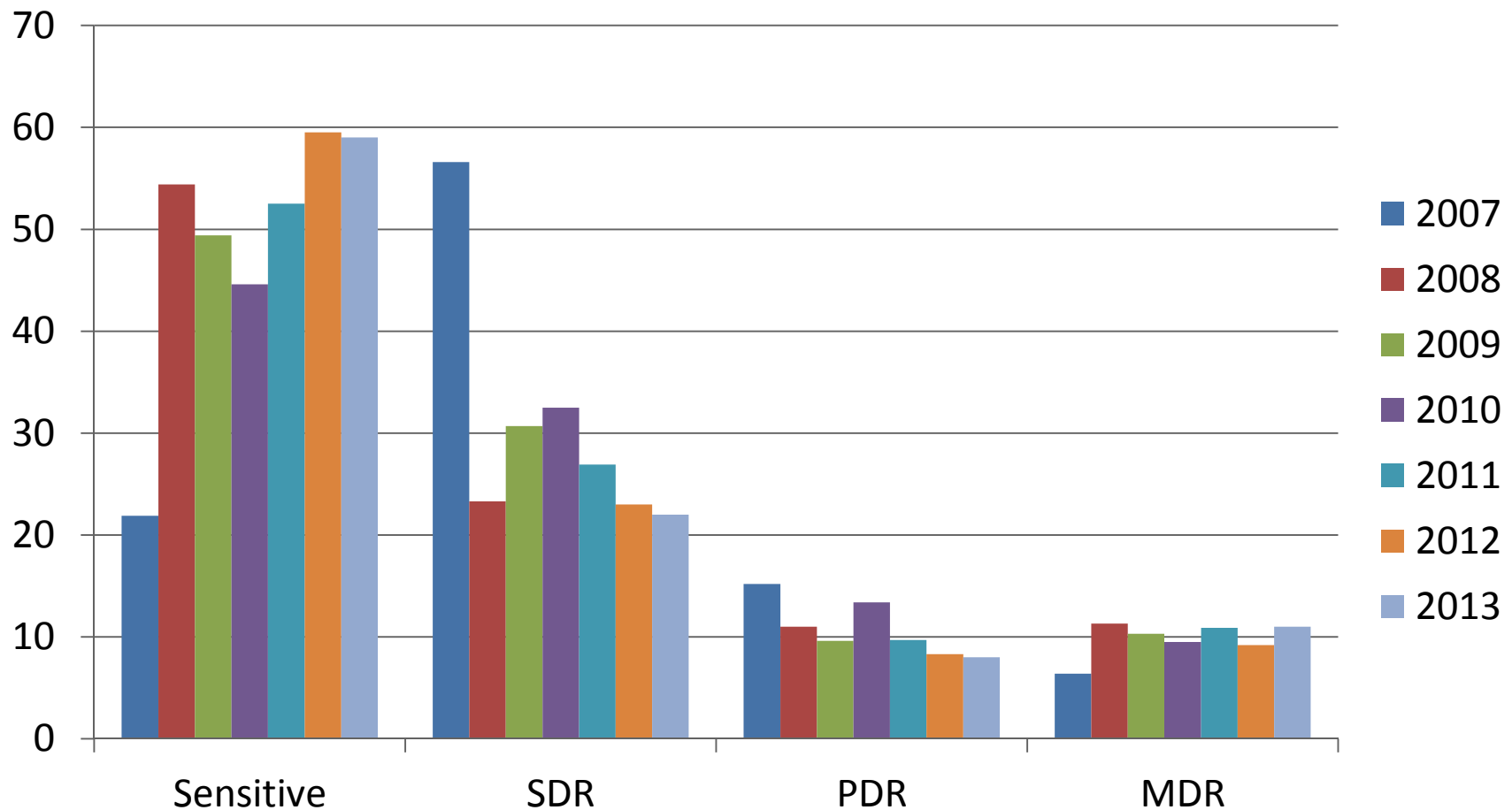
Proportion of NSP PTB, NSN PTB, Extrapulmonary TB cases out of all new cases notified, Georgia, 2000-2012



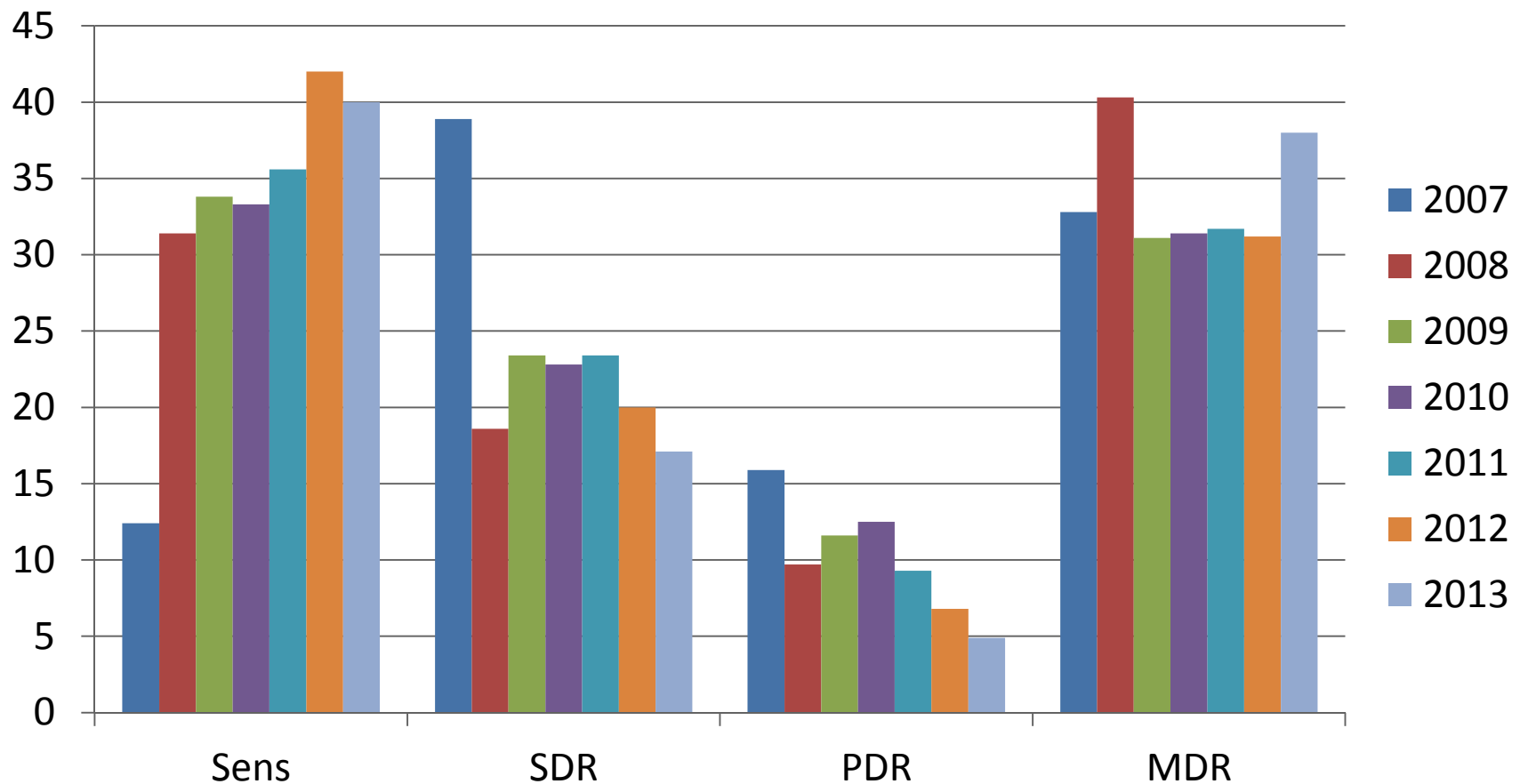
TB Drug Resistance(%), WHO Survey, Georgia,2005-2006



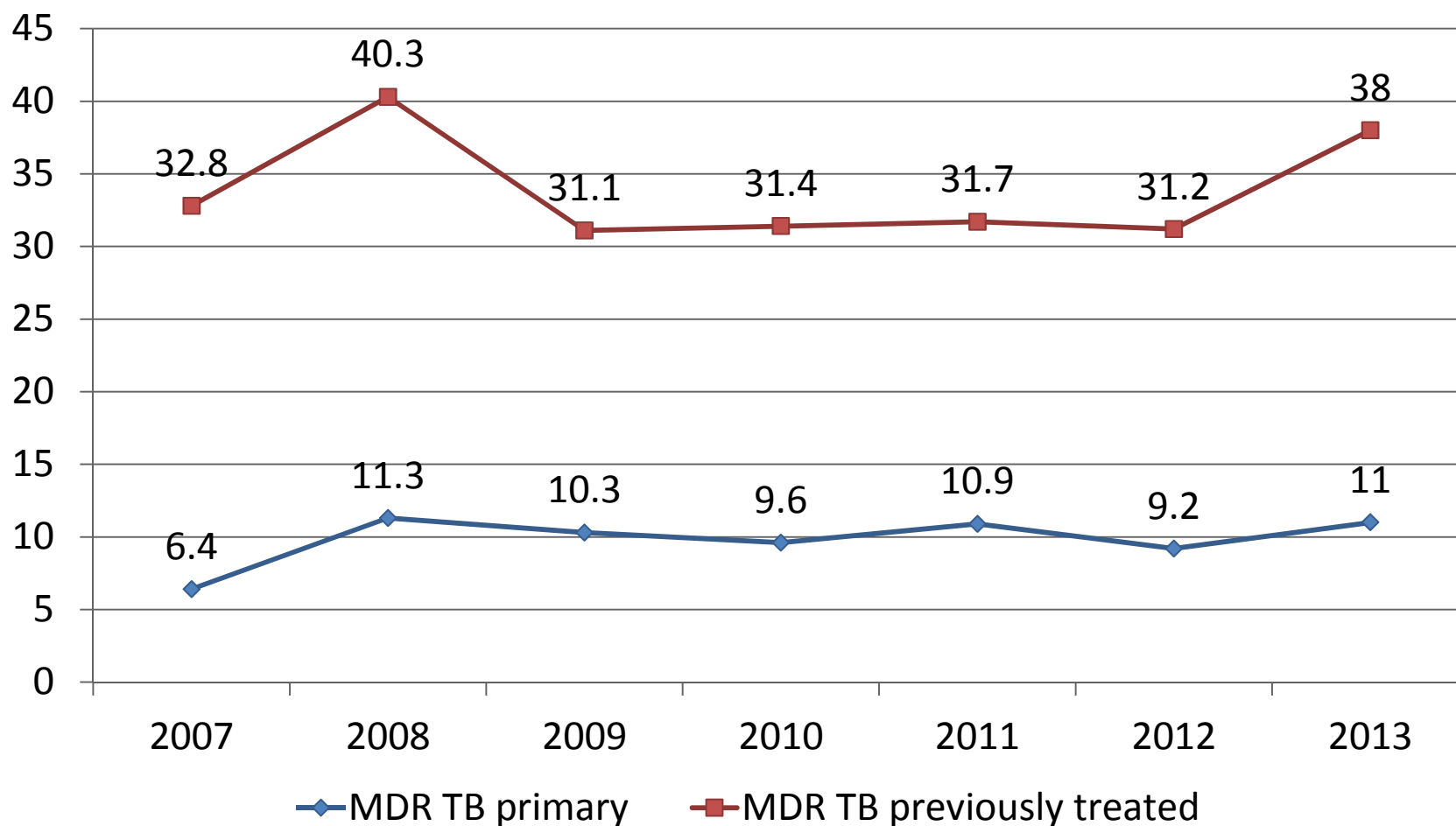
Resistance to the first-line anti-TB drugs(%), new cases 2007-2013



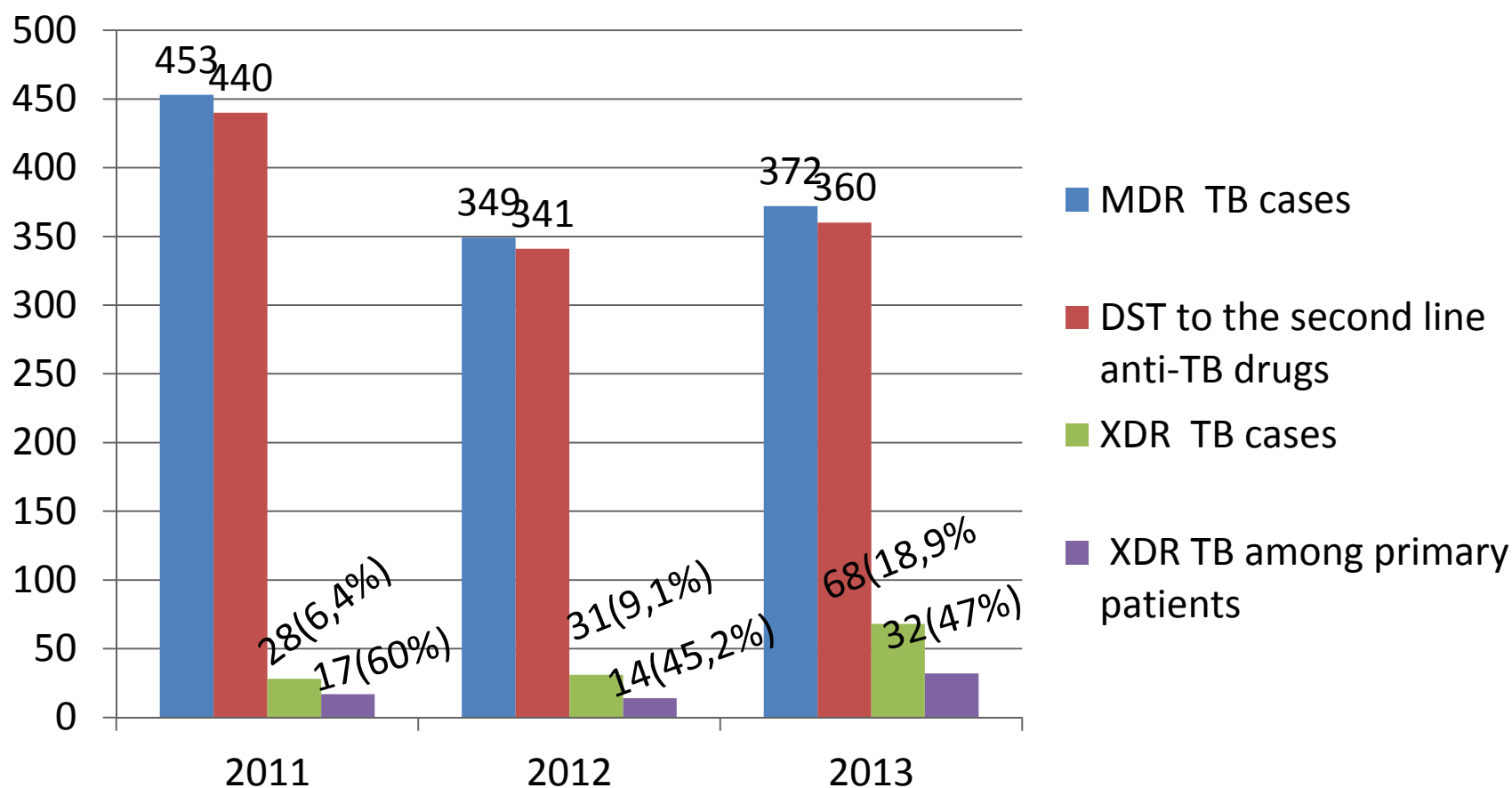
Drug resistance to the first-line anti-TB drugs among retreatment cases (%), 2007-2013



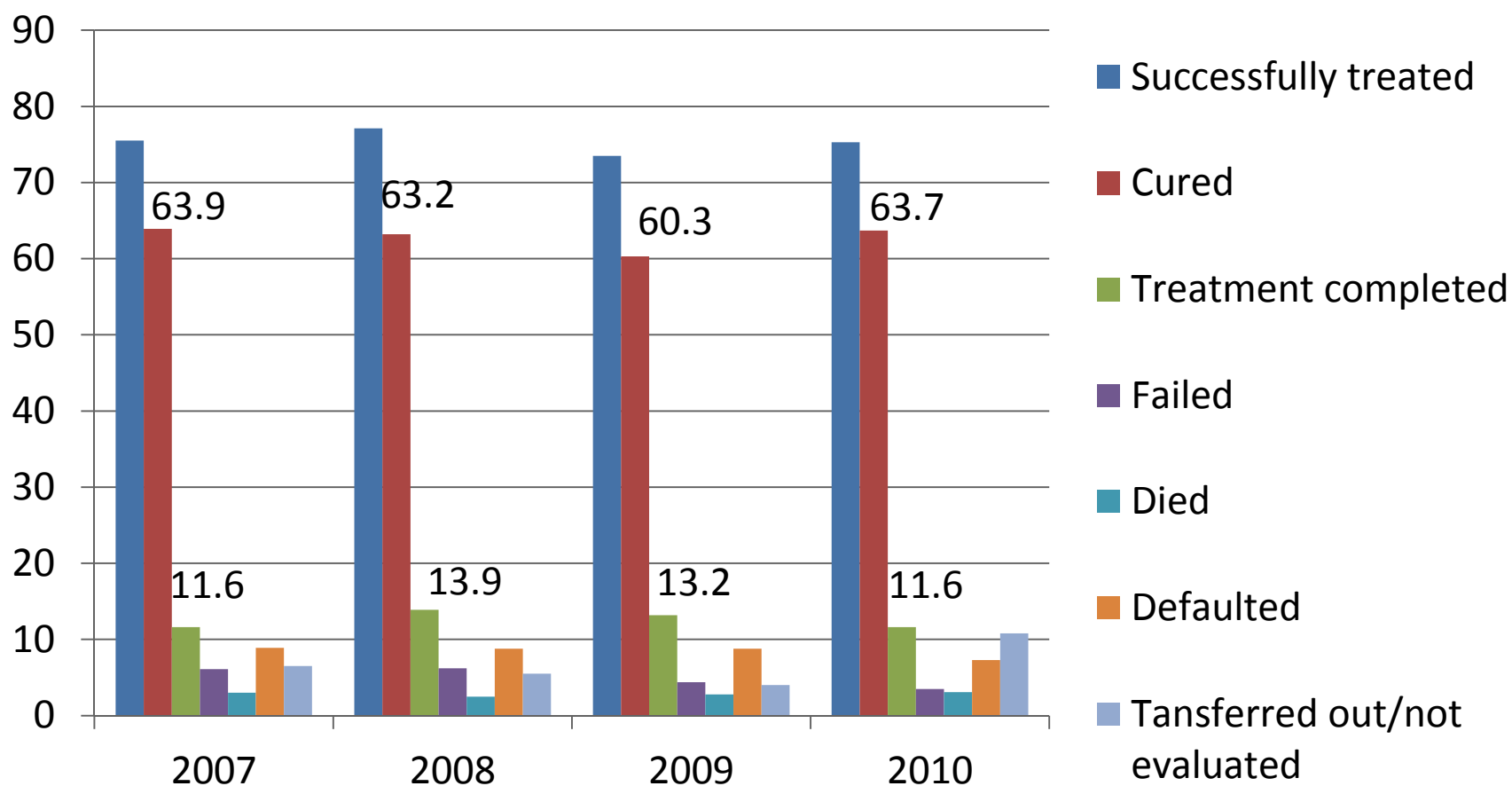
MDR TB among Primary and Previously treated patients (%), Georgia, 2007-2013



Cases of XDR TB, Georgia, 2011-2012

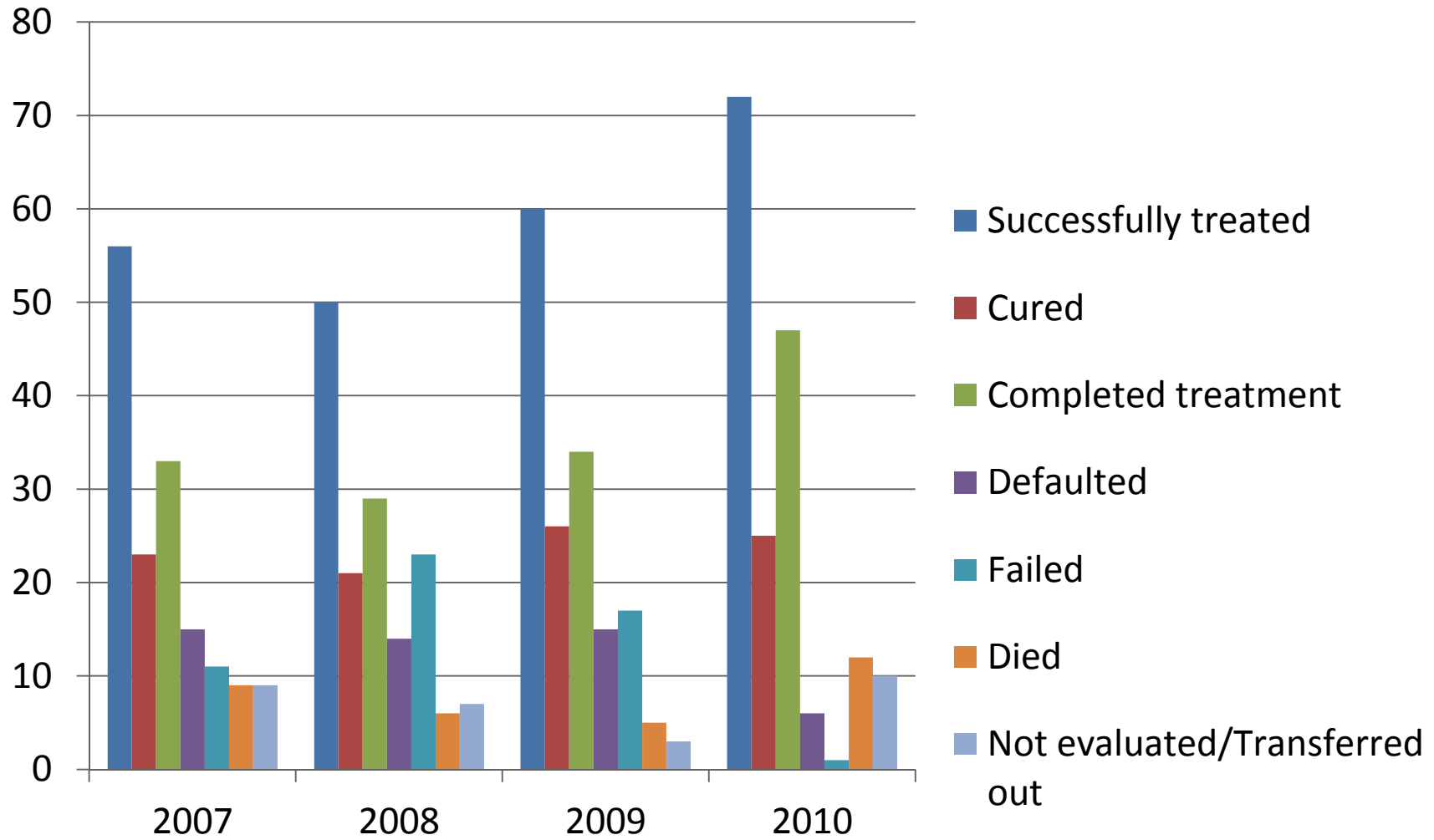


Treatment outcomes, new(ss+)cases of pulmonary TB(%), 2007-2010



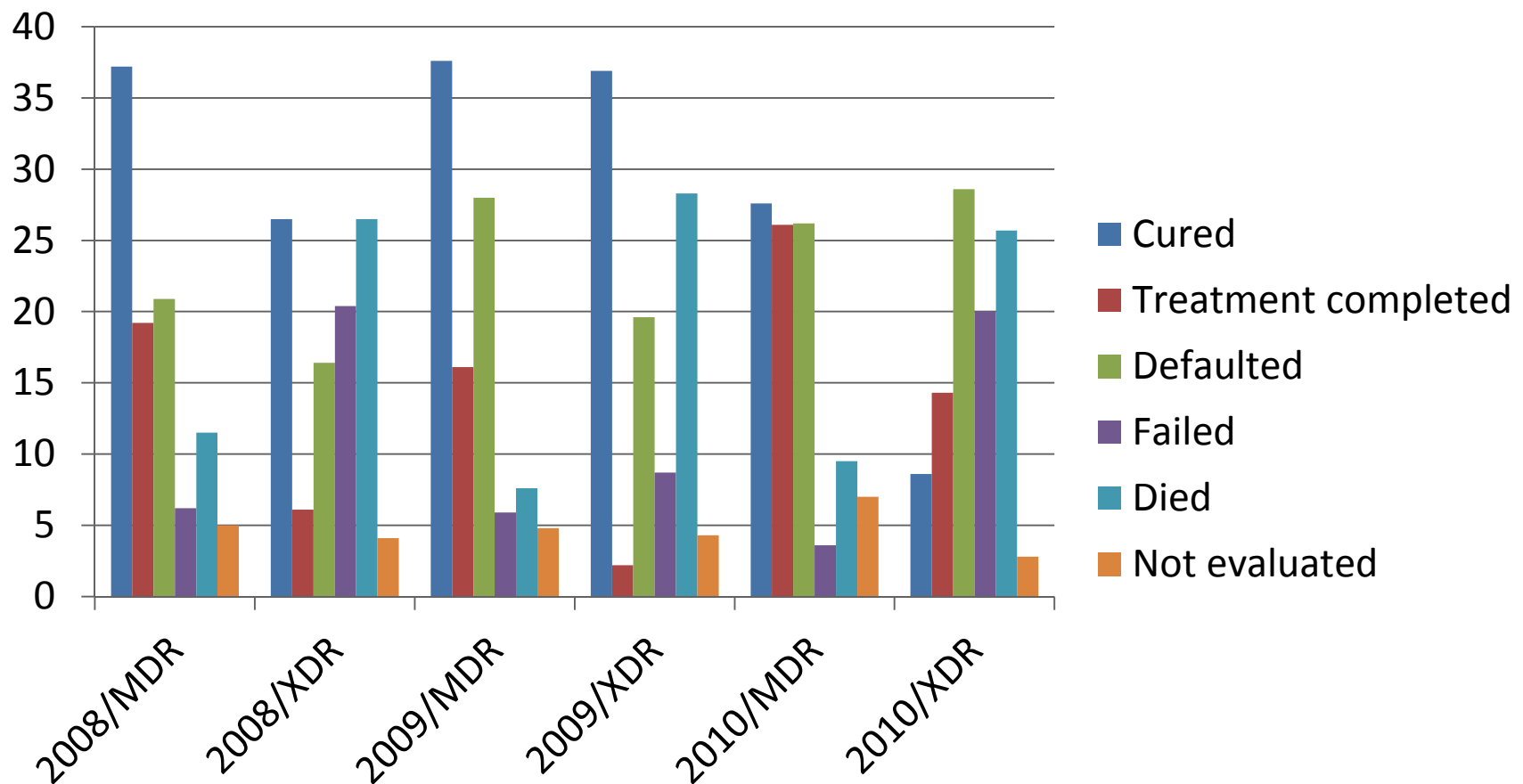
Treatment outcomes, Retreatment cases(%)

Georgia, 2007-2010

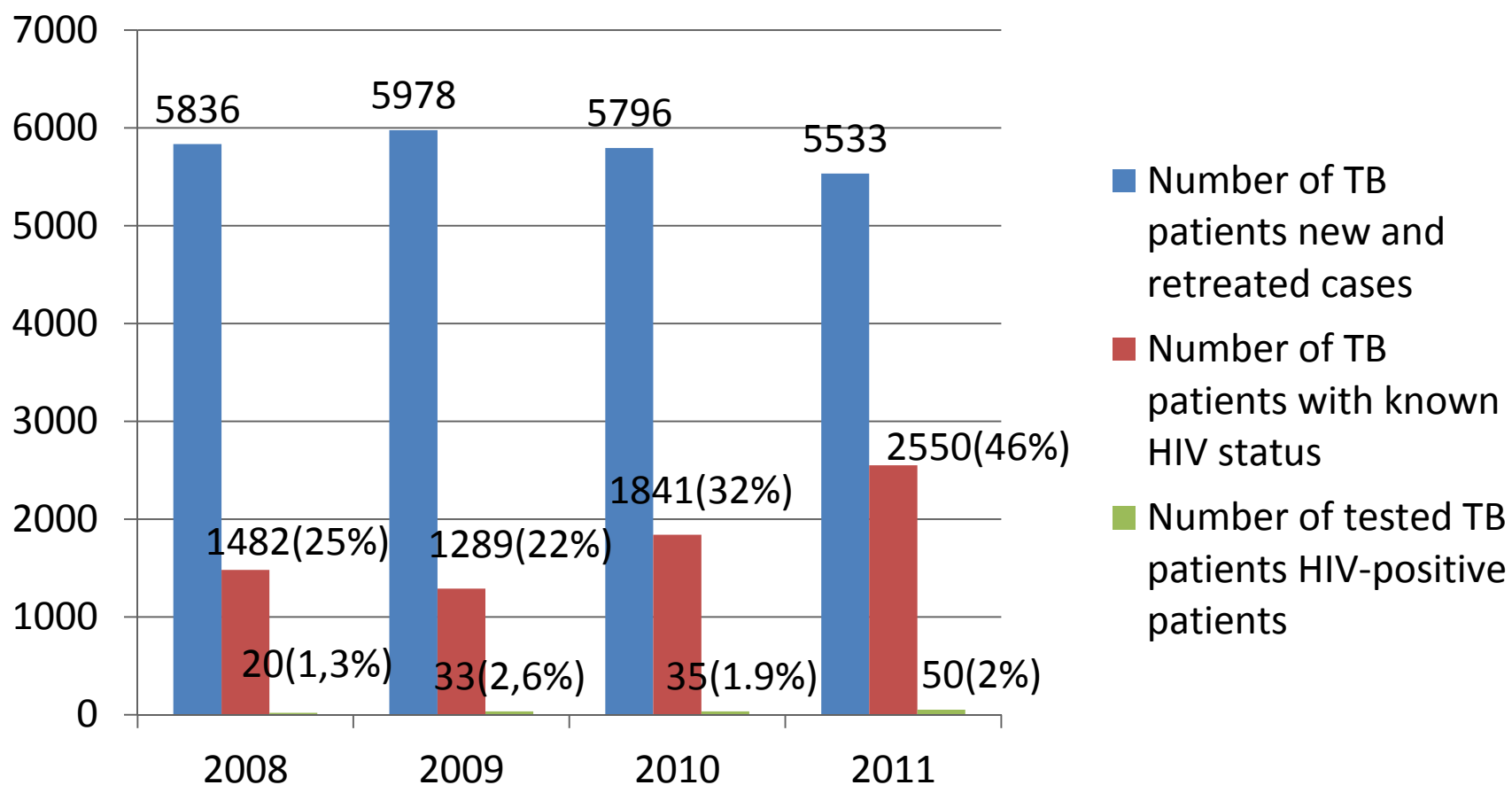


Treatment outcomes, M/XDR TB cases(%)

Georgia, 2008-2010



HIV testing of TB patients, Georgia, 2008-2011, WHO





NCDC Research Activities

- 2001 - 2005/ NCDC – NCTBLD in collaboration with Emory University - “ Clinical and Molecular Epidemiology of Drug-Resistant Tuberculosis in Georgia “ funded by DHHS BTEP (BTEP #12 , ISTC # G-610)
- 2004 – 2007 NCDC - NCTBLD in collaboration with US CDC “Development of Multiple Drug Resistant Tuberculosis (MDRTB) Surveillance and National TB Program (NTP) Evaluations, Republics of Armenia and Georgia” , funded by DHHS BTEP (BTEP # 72, ISTC#A-998)
- 2009-2011 NCDC , NCTBLD, Emory University - “Risk factors for XDR TB and evaluation of the GenoType MTBDRplus assay for rifampin and isoniazid rapid testing in country of Georgia”, CRDF# 2935
- 2012-2013 NCDC “Comparison of different diagnostic methods for identification of active tuberculosis among HIV infected patients” (STCU/BTEP # P531)

NCDC Research Activities (II)

- **Assessment of prevalence and risk factors for drug-resistant TB, including MDR-TB**

The overall prevalence of MDR-TB - 28.1% (10.5% of newly diagnosed patients and 53.1% of retreatment cases).

Risk factors for MDR-TB - being a retreatment case (PR =5.28, 95% CI 3.95-7.07); history of injection drug use (PR=1.59, 95% CI 1.21-2.09); and female gender (PR=1.36, 95% CI 1.12-1.65).

- **Establishment of TB genotyping program employing IS6110 RFLP analysis**

Isolates from 227 patients were investigated; 52 strains (22.9%) were classified into 22 clusters, 175 (77.1%) strains presented unique RFLP fingerprint patterns. Majority of strains (91.63%) contained from 7 to 17 IS6110 copies, with a mean of 11 bands

- **Evaluation of accuracy of Genotype MTBDRplus (HAIN Lifescience) in detecting Mycobacterium TB Complex and its resistance to rifampin and isoniazidin comparison to conventional methods among AFB smear-positive TB patients**

500 sputum specimens of AFB smear positive patients by the Genotype MTBDRplus technique and their comparison to DST showed a high accuracy of MTBDRplus assay and significantly reduced time to detection of MDR-TB.

NCDC Research Activities (III)

- **Assessment of rates of and risk factors for XDR-TB in Georgia in a population-based study**

Second line DST - 236 MDR strains of *M tuberculosis*. The overall prevalence of XDR TB 13.1% (12.6% among newly diagnosed patients with MDR-TB and 13.6% among retreatment cases)

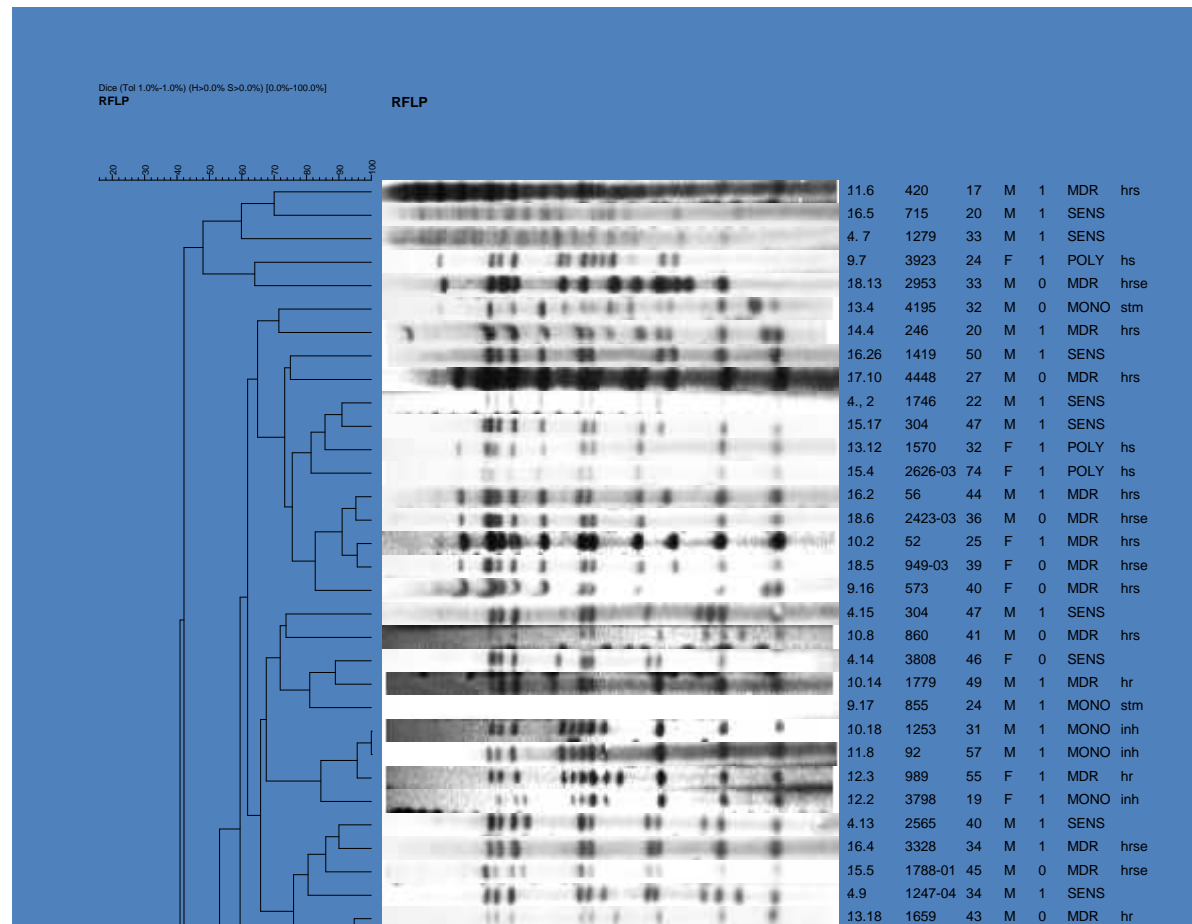
- **Assessment of the outcomes of treatment and risk factors for relapse and poor outcomes (death, failure) among patients enrolled in the population based WHO Drug Resistance Survey who were treated with first line anti-TB drugs.**

The outcomes of first-line anti-TB treatment for MDR-TB group :

23.5% (36/153) cured; 6.5% (10/153) completed; 19% (29/153) defaulted; 26.8% (41/153) failed; 15.7% (24/153) died; 8.5% (13/153) transferred out.

Multivariate analysis for bad treatment outcomes - having MDR-TB (OR 4.87, 95% CI 3.33-7.13); previous anti-TB treatment (OR 3.8, 95% CI 2.9-4.9); male gender (OR 1.70, 95% CI 1.2-2.4); former prisoner (OR 1.8, 95% CI 1.2-2.5) ; unemployed OR 1.74, 95% CI 1.16-2.6) ;

Dendrogram of *M. tuberculosis* strains isolated in Georgia, 2001-2005, BTEP #12





Ongoing research

- 2014-2015 NCDC - NCTBLD in collaboration with US CDC
“Molecular Epidemiology of Multidrug Resistant and Extensively Drug Resistant Tuberculosis in country of Georgia” (ISTC/BTEP # G2100)
1. To determine the magnitude of, and risk factors for the development of extensively drug-resistant TB (XDR TB) in Georgia
 2. Expand the existing genotyping program in Georgia to include PCR-based methods - Spacer Oligonucleotide Genotyping (Spoligotyping) and Mycobacterial interspersed repetitive unit (MIRU) analysis
 3. Characterize molecular epidemiology of MDR/XDR TB in Georgia



Future plans

- NCDC plans to continue research and collaboration in the following areas:
 - Rapid identification of MDR TB using new molecular technologies
 - Characterization of the sequences of the loci associated with multidrug resistance in clinical isolates of *M. tuberculosis* to identify the respective mutations
 - Investigation and prophylaxis of LTB