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Title: Multidrug-resistant tuberculosis and HIV infection in Eastern Europe: Two overlapping epidemics

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Body: Background: The number of people living with HIV has increased nearly three times in the former Soviet Union since 2000. Meanwhile, this is one of the world's region most severely affected by multidrug-resistant tuberculosis (MDR-TB), with nearly half of patients with TB having MDR-TB in some settings. Methods: Available drug resistance surveillance data between 2006 and 2011 were analysed from Belarus, Estonia, Latvia, Republic of Moldova, and Ukraine to explore the association between HIV and MDR-TB. Results: In all 5 countries a significant positive association between MDR-TB and HIV was documented (range OR: 1.5-2.6, p value<0.05 for all). Overall, combining data from all countries (6,455 TB cases tested for HIV and MDR-TB) the odds of having MDR-TB among HIV-positive patients were 110% higher than among HIV-negative patients (pooled OR: 2.1, 95%CI: 1.2-3.3; OR consistent across countries $I^2=19.2\%$) and the difference was statistically significant. Conclusions: The association between HIV and MDR-TB epidemics found in these countries is alarming. Patients with dual HIV/MDR-TB infection require complex treatment with anti-retrovirals and toxic, expensive anti-TB drugs. The likelihood of successful outcome is low and transmission of MDR-TB to others is high. Urgent measures should be implemented to strengthen HIV prevention and treatment, contain the spreading of MDR-TB, and improve collaboration between HIV and TB control activities, particularly for individuals at high risk of dual infection such as people who inject drugs and those in congregate settings. Further operational research to identify the determinants and conditions leading to MDR-TB in people living with HIV is needed.