TB and injecting drug use in Eastern Europe Clinical and Epidemiological Aspects and Implications for Public Health

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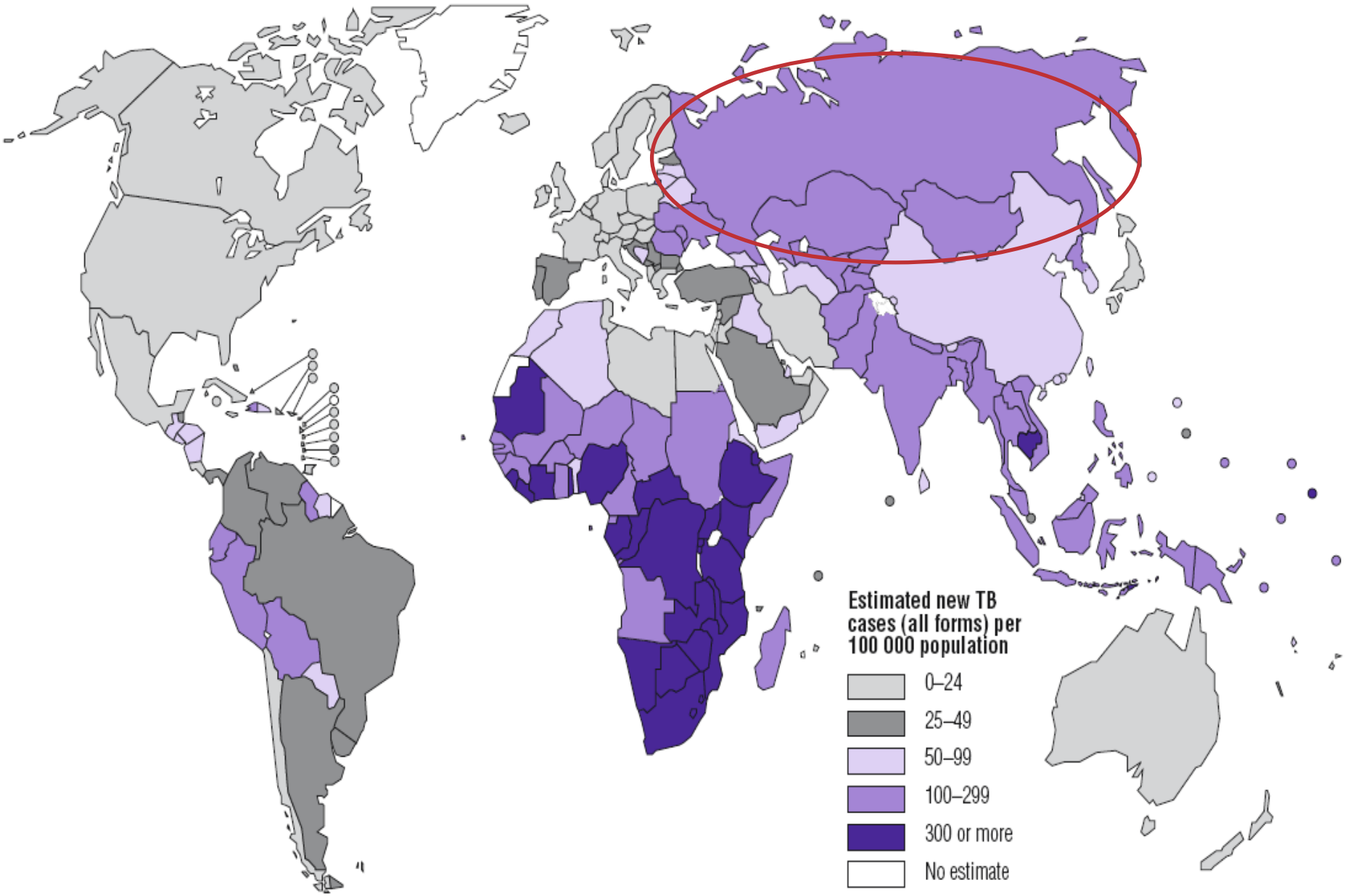
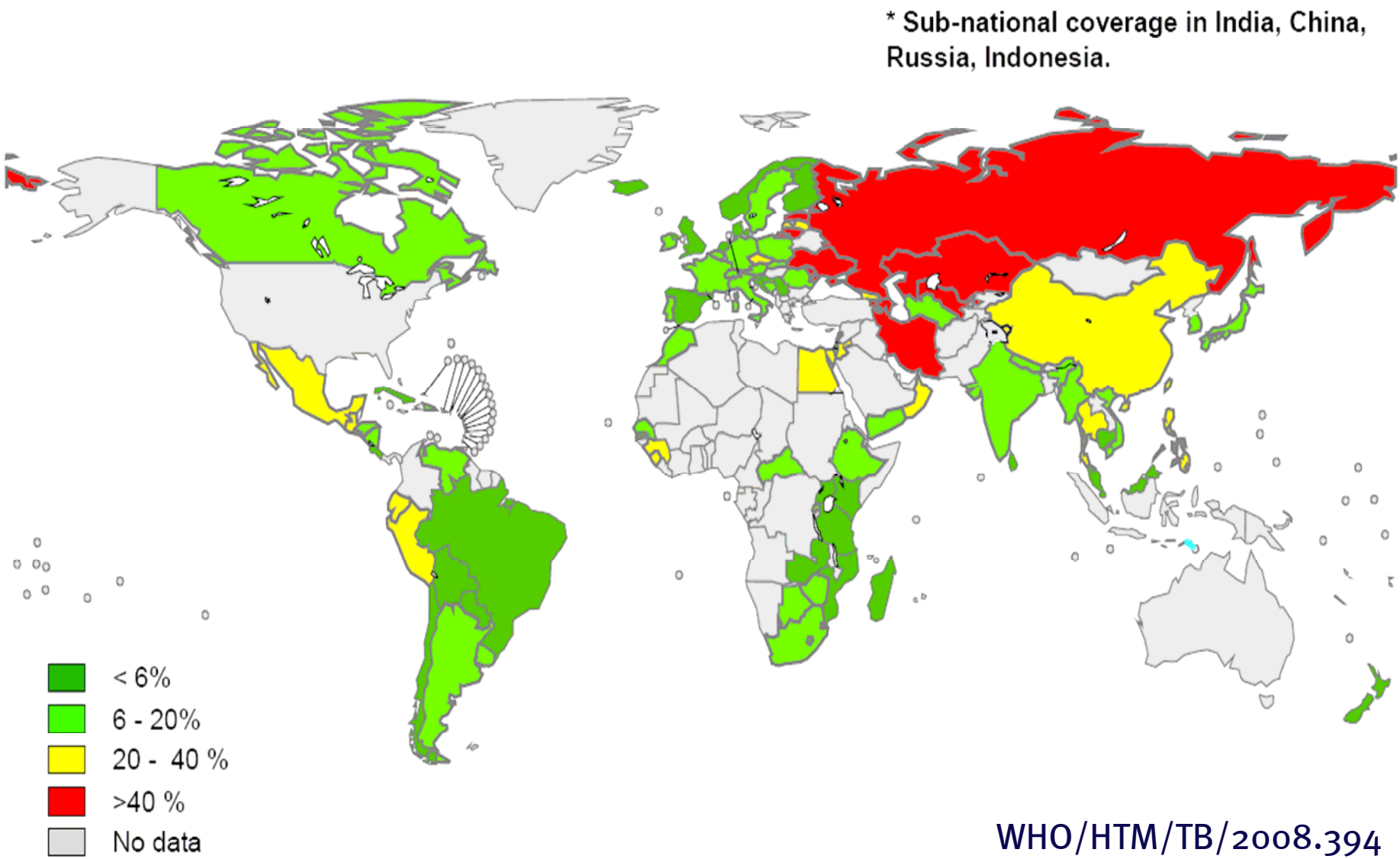
Mycobacterium tuberculosis is the most pervasive, morbid, and lethal microbial pathogen of humans…Tuberculosis has neither intermediate vector… nor reservoir in nature…its only vessel for transport through time and across space is a person infected with the bacillus

Michael D. Iseman

Estimated TB incidence rates, by country, 2006



Map 6: MDR-TB among previously treated TB cases 1994-2007

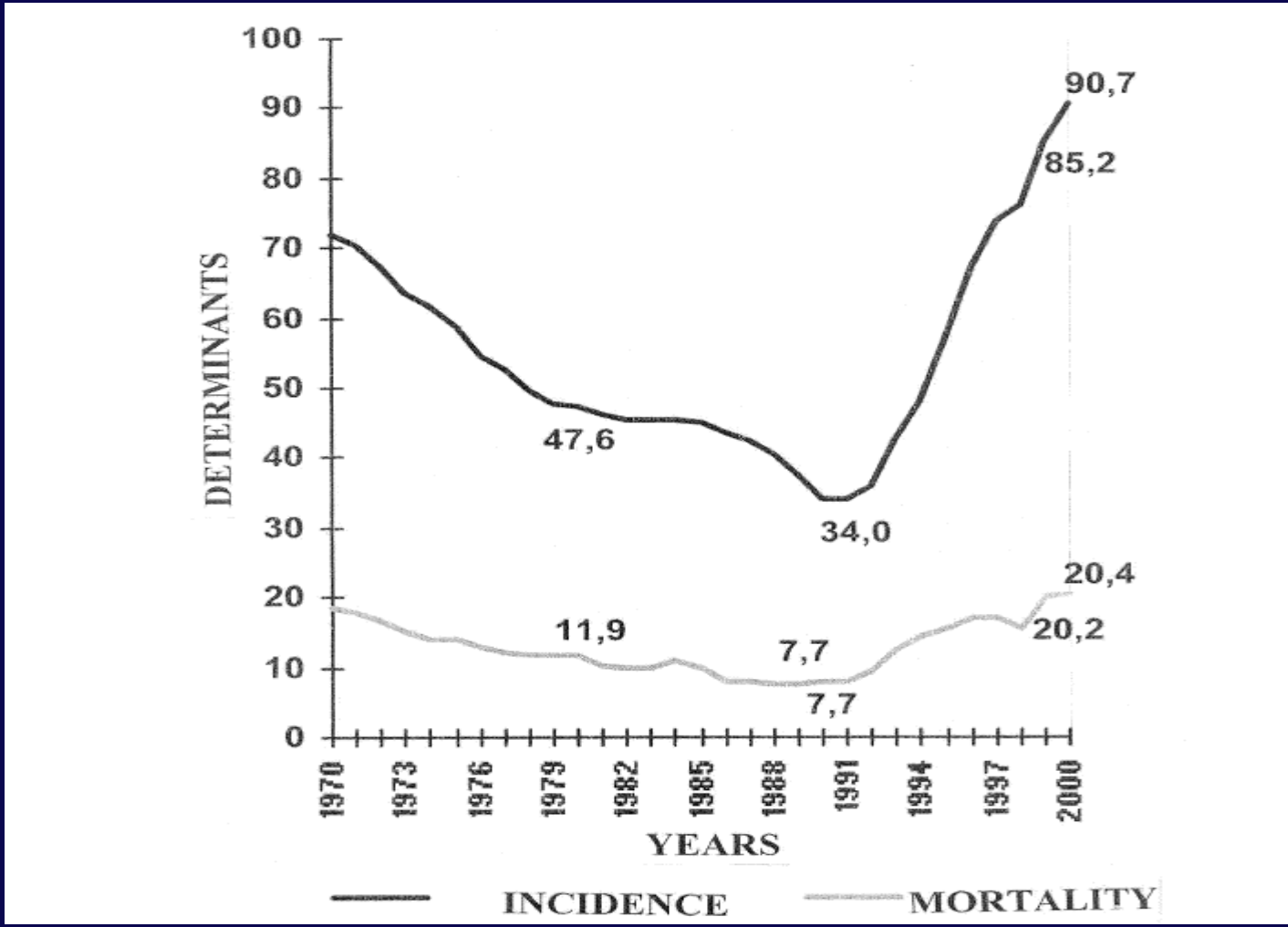


WHO/HTM/TB/2008.394

Tuberculosis is a social disease, and presents problems that transcend the traditional medical approach... It is the consequence of gross defects in social organization, and errors in individual behavior

René and Jean Dubos, *The White Plague* (1952)

Dynamics of TB incidence and mortality rates in Russia 1970 – 2000 (per 100,000)



Shilova et al *Ann.N Y.Acad.Sci.* 2001

Possible factors associated with TB increase in Eastern Europe: social and economic conditions

- Political changes
- Economic transition and decline
- Increase of unemployment, impoverishment and crime
- Growth of informal economics
- High level of imprisonment
- Civil war in many countries and war with neighbouring countries

The World Bank ECSHD, 2000
Rhodes et al. 1999

Possible factors associated with TB increase in Eastern Europe: **health conditions**

- Disinvestment in state-run health-care delivery systems
- Decline in public health infrastructure
- Deterioration of TB control service
- Malnutrition
- Stress
- Alcohol abuse and IDU

Shilova et al. 2001

Characteristics of TB epidemic in Eastern Europe

- ~ 70% of all TB cases reported in Europe
  - ›250.000 of TB cases occur every year
  - High prevalence of TB in prisons
- Compared to other regions of the world,
  - highest rate of treatment failure (7%) and 2nd-highest rate of death (6%) as treatment outcome
  - Highest rate of MDR-TB: 9 – 22%, where 1 of 10 MDR-TB cases is XDR-TB
- In Russia ~ 30 000 people die every year and another 30 000 are disabled as a result of TB disease

WHO-Europe TB Report 2008

Characteristics of TB epidemic in Eastern Europe

High level of TB in prisons and among IDUs

↓

Low treatment adherence

↓

High level of MDR-TB, treatment failure and mortality

IDU is associated with increases rates of TB

- TB disease rates (Reichman et al 1979; Rhodes et al)
  - higher among IDUs than in general population
- TB infection rates (Portu et al. 2002)
  - higher among IDUs than in general population
- TB in IDUs (Nissapatorn et al. 2004; Morozova et al. 2003)
  - more likely to be extrapulmonary
  - higher risk of MDR-TB

IDU in Eastern Europe

- Worldwide: 13.1mln IDUs; ~25% live in EE (UNODC 2008)
- Economical and political changes created a rich background for a rise in IDU (Schwalbe 2002)
- Opening of borders has allowed drugs to move freely through the region (Schwalbe 2002)
- Involves mainly young population
- High rates of IDU in prisons

IDU in Eastern Europe: obstacles

- Harm reduction (HR), including needle exchange programmes are not widely available:
  - Limited, unavailable or illegal substitution therapy
  - Limited national support
- Stigma, discrimination and criminalisation

Methadone and Buprenorphine Availability

Central/Eastern European and Former Soviet Union Countries with Injection-Driven HIV Epidemics, 2007

	Estimated number of IDUs	Total number of patients on methadone	Total number of patients on buprenorphine	Percent of IDUs receiving treatment
Armenia	8,800	0	0	0%
Azerbaijan	19,335	93	0	0.43%
Belarus	45,842	15	0	0.03%
Estonia	19,877	530	165	3.50%
Georgia	12,420	225	0	1.81%
Kazakhstan	173,699	0	0	0%
Kyrgyzstan	44,398	194	0	0.44%
Latvia	18,725	50	0	0.27%
Lithuania	8,500	436	0	5.13%
Moldova	42,955	36	0	0.08%
Poland	96,514	720	0	0.75%
Russia	2,250,000	0	0	0%
Tajikistan	52,598	0	0	0%
Ukraine	400,000	0	522	0.13%
Uzbekistan	86,795	37	90	0.14%
Total CEE/FSU	**3,280,458**	**2,299**	**808**	**0.9%**

IHRD *Open Society Institute* 2008

IDU is a major mode of HIV transmission in EE

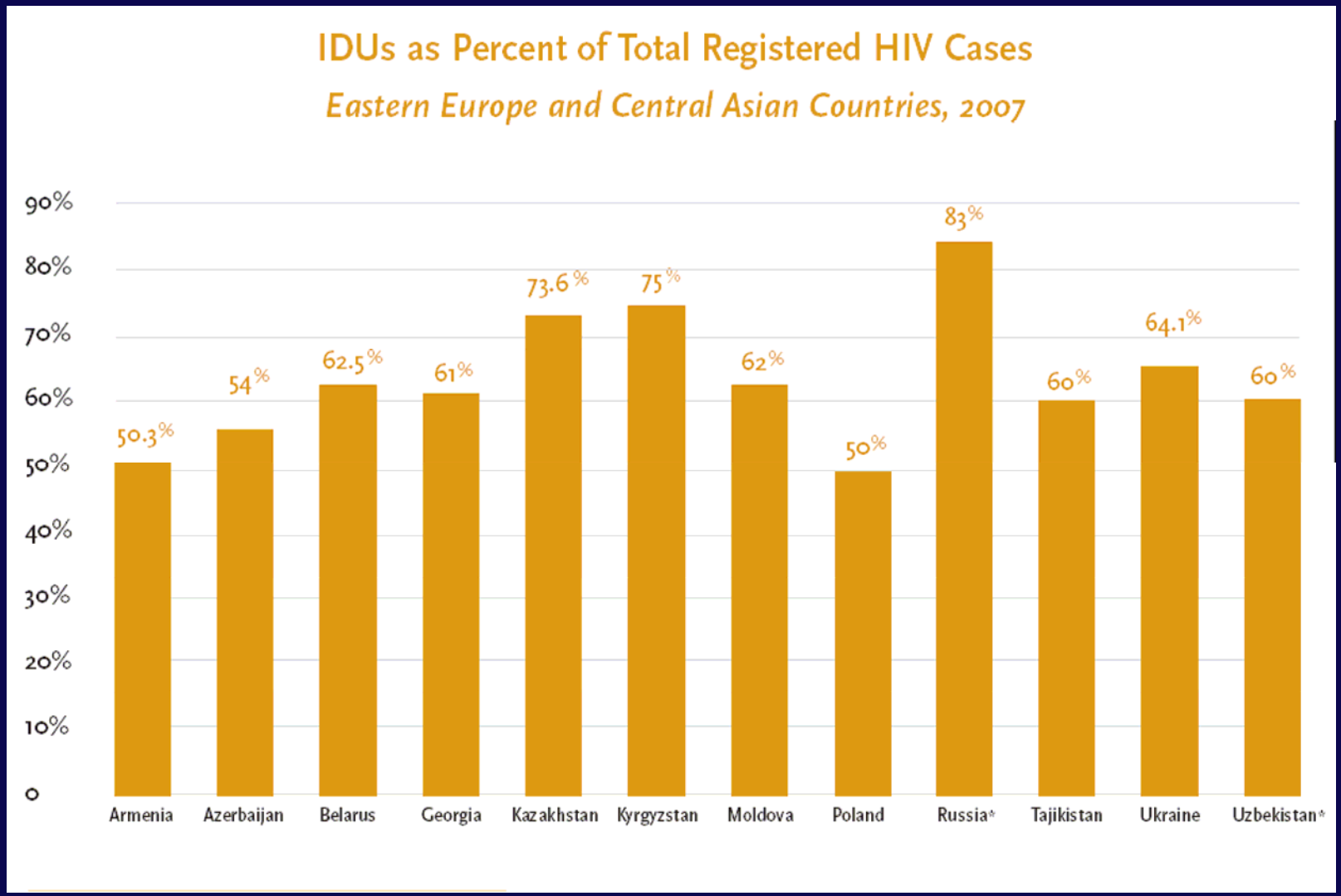


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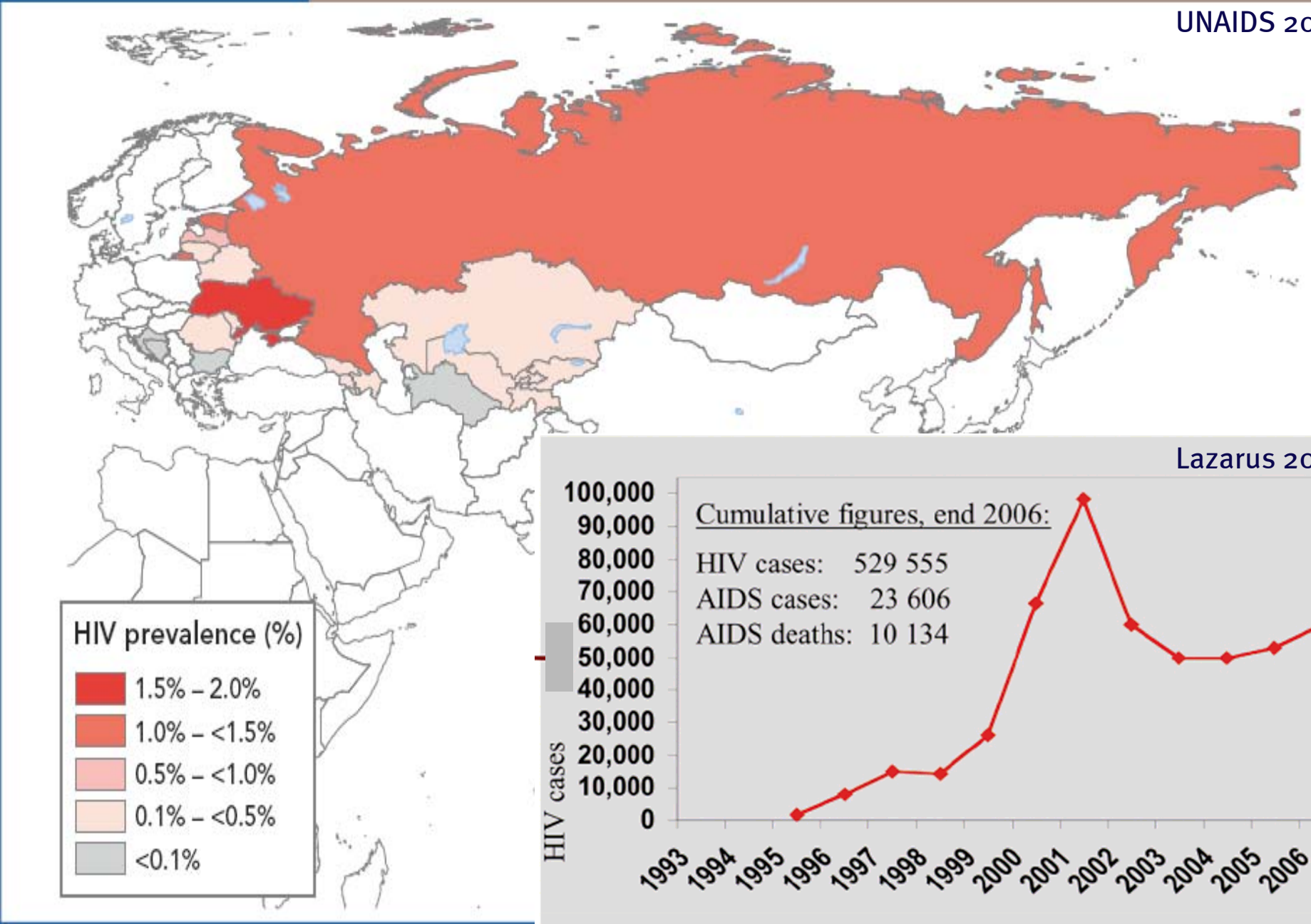
FIGURE 2.16 HIV prevalence (%) in adults (15–49) in Eastern Europe and Central Asia, 2007

UNAIDS 2008



Lazarus 2008

Characteristics of HIV epidemic in EE: EuroSIDA study

- Younger HIV population compared to the rest of Europe
- High proportion coinfected with HCV
- A high proportion of TB as AIDS diagnosis
- Low usage of combination ART
- Lower initial virologic response to cART and higher rates of triple class failure
- Less frequently laboratory monitoring

IDU, TB and HIV

- Progression to TB disease is dramatically increased by HIV
  - HIV-neg – 5-10% lifetime risk
  - HIV-pos – 5-10% annual risk

- Study from Amsterdam cohort: “HIV infection increases the risk for active tuberculosis in Amsterdam drug users 13-fold.” (Rhodes et al, *Addiction* 1999)

HIV/TB collaborative study: characteristics of HIV/TB patients in Europe and Argentina

At TB diagnosis	Argentina/ Southern Europe	Central/ Northern Europe	Eastern Europe
N =	151	130	614
Gender, male, %	64	47	72
Age, years, median (IQR)	36 (31-43)	37 (31-44)	30 (26-35)
Origin, other than country of site, %	19	69	2
HIV risk factor, IDU, %	19	9	62
TB risk factor, %			
IDU	39	14	80
Prison	7	2	24
Alcohol	24	3	36
Family	32	9	14

Podlekareva *et al.* CROI 2008

HIV/TB collaborative study: **anti-tuberculosis therapy**

Initial TB treatment:	A/S	C/N	EE	*p*
N =	146	130	583	
4 1st line drugs, %	74	83	26	‹0,0001
3 1st line drugs, %	17	12	41	‹ 0,0001
› 1 2nd line drugs, %	13	12	63	‹ 0,0001
- Streptomycin, %	45	6	55	‹ 0,0001

A/S: Argentina/Southern Europe; C/N: Central Northern Europe; EE: Eastern Europe

Podlekareva *et al.* CROI 2008

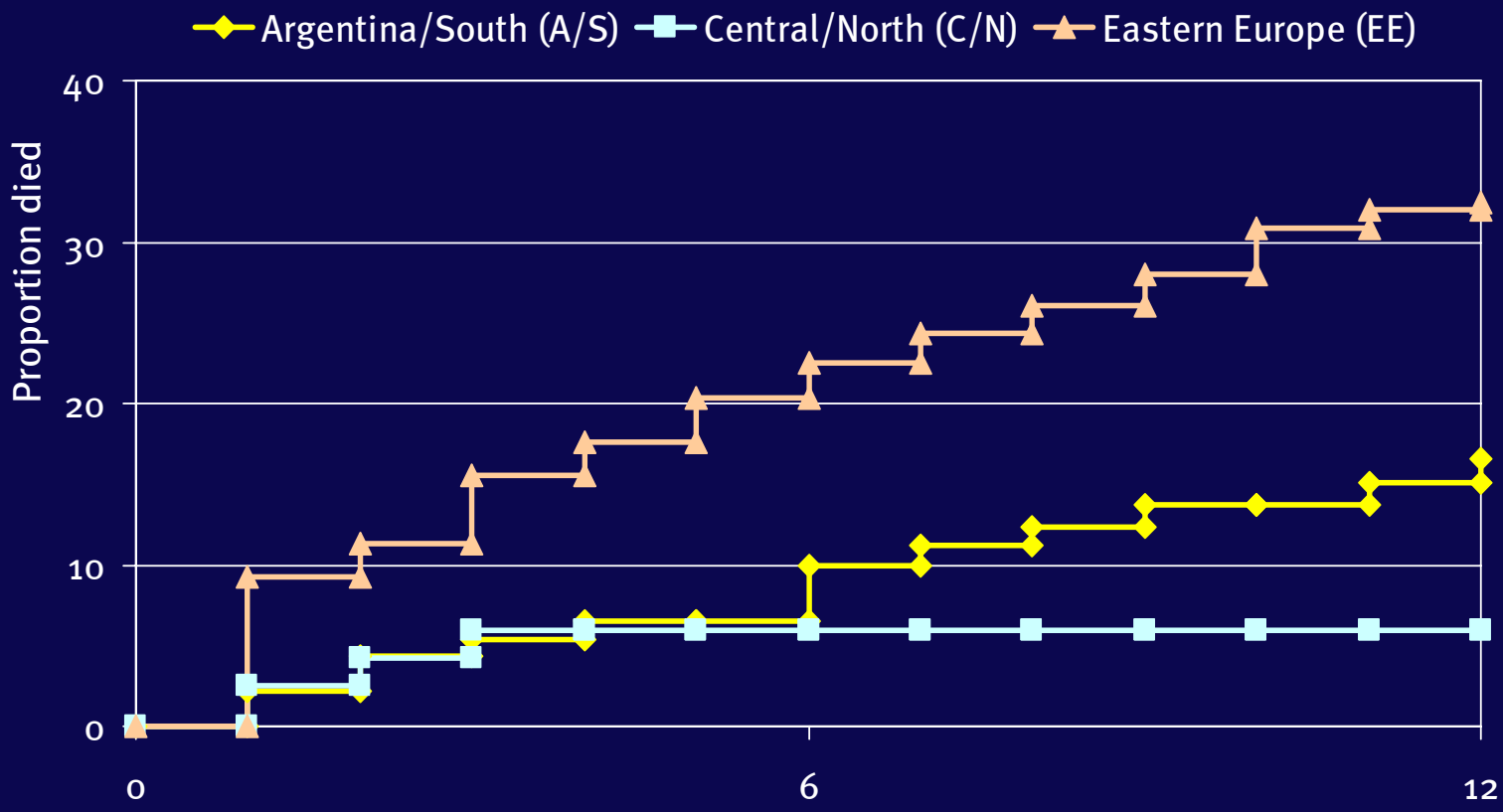
HIV/TB collaborative study: antiretroviral therapy

	S/A	C/N	EE	*p*
Any Antiretroviral therapy (ART): N=	122	119	149	
% on ART ≥ 1 month prior to TB	31	39	8	<0.0001
% on ART at 6 month after TB (95% CI)	68 (58-77)	81 (72-90)	23 (19-27)	<0.0001

A/S: Argentina/Southern Europe; C/N: Central Northern Europe; EE: Eastern Europe

Podlekareva *et al.* CROI 2008

HIV/TB collaborative study:
mortality rates among HIV/TB coinfected patients



N under follow-up			
S/A	99	77	52
C/N	120	109	89
EE	594	300	157

Podlekareva *et al.* CROI 2008

Management of IDU, TB and HIV in Eastern Europe

- Treatment for IDU, TB and HIV is under different services of Health Ministry and carried out in different hospitals by different specialists
  - IDU: Narcology service
  - TB: Phthisiology service
  - HIV: Infectious disease hospitals
  - STI: Dermato-venerology hospitals
  - Limited level of collaboration and data exchange
- Prisons are under Ministry of Justice
- Serious surveillance problems

Personal communication

Summary

- TB, HIV and IDU in Eastern Europe are closely related epidemics and therefore should be addressed as one problem
- There is a need for concerted actions to improve the situation including:
  - Multidisciplinary collaboration of HIV, TB and narcology services
  - Wide spread of harm reduction and out-reach programmes
  - Screening and prophylactic TB treatment in high risk groups
  - Increase population awareness about HIV and TB infections and modes of transmission
- Improvement of management of MDR-TB
- Securing access to cART for those in need, improvement in laboratory assessment of HIV disease and maintaining virologic suppression

...it had become obvious that... healthy living could mitigate its [TB] harmful effects. Reformers could attack the disease from two directions, by improving the individual life of man and by correcting social evils.

René and Jean Dubos, 1992