RESPOND International Cohort Consortium of Infectious Diseases

Modifiable risk factors and their population attributable fractions for TB in People with HIV across Europe

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Disclosures

- No disclosures for Christian Kraef

Background and objective

- Tuberculosis (TB) leading infectious cause of death in People with HIV
- High prevalence of TB/HIV co-infections in Eastern Europe

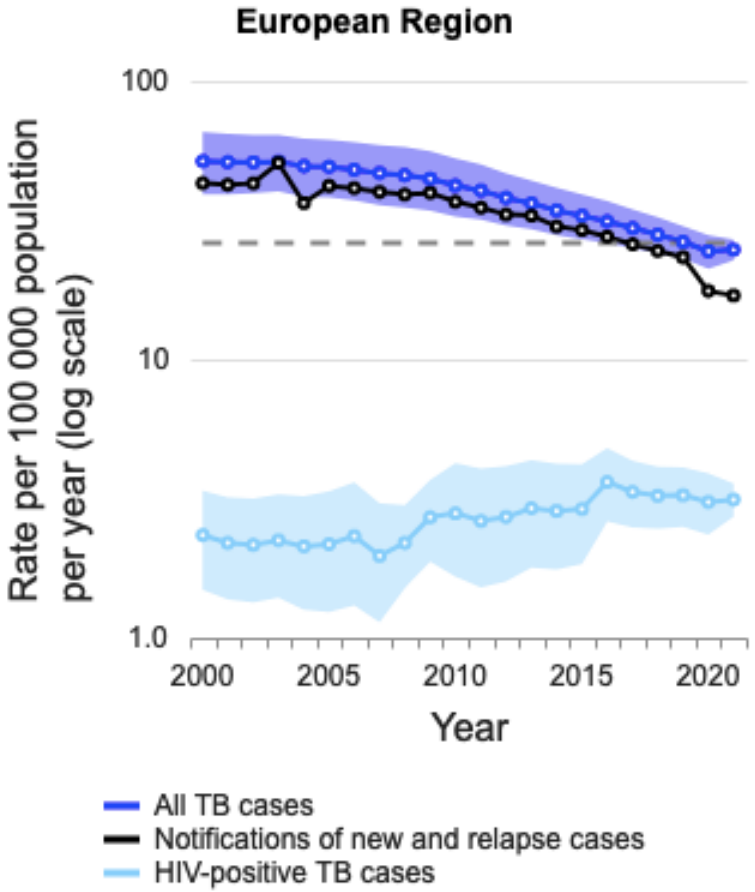
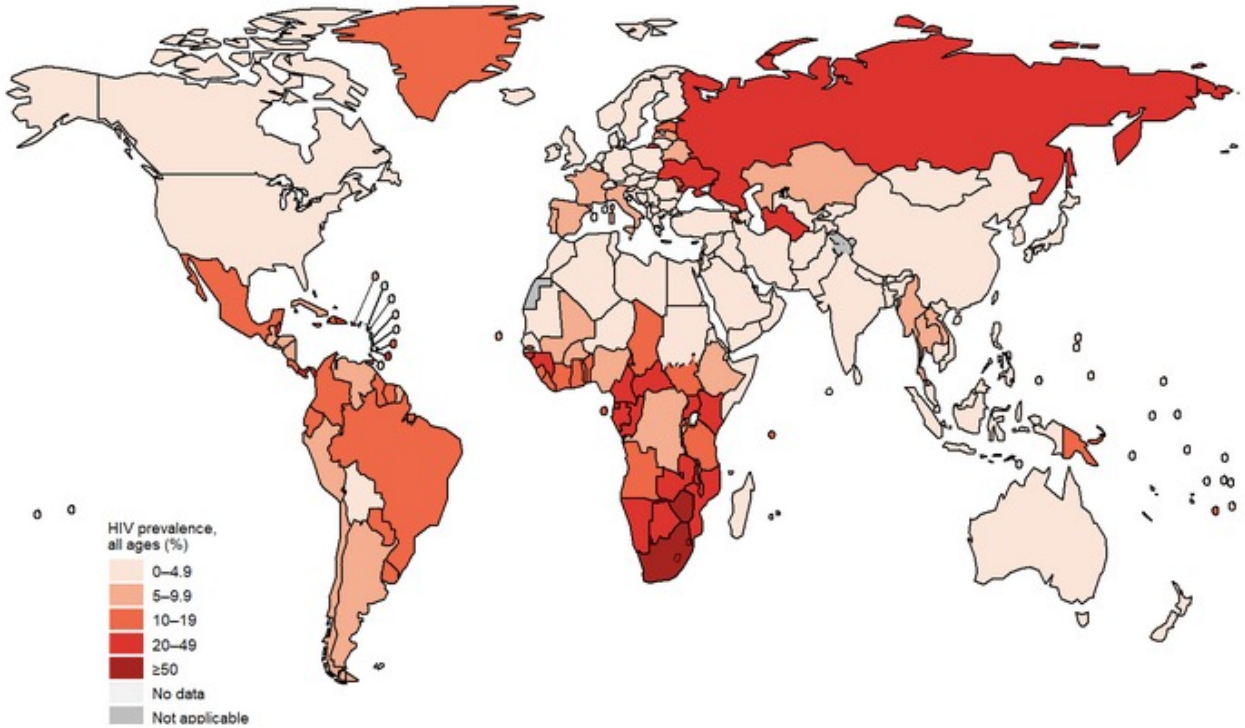


Fig. 2.1.4 Estimated HIV prevalence in people with new or relapse TB, 2021



WHO, Global Tuberculosis Report 2022

Background and objective

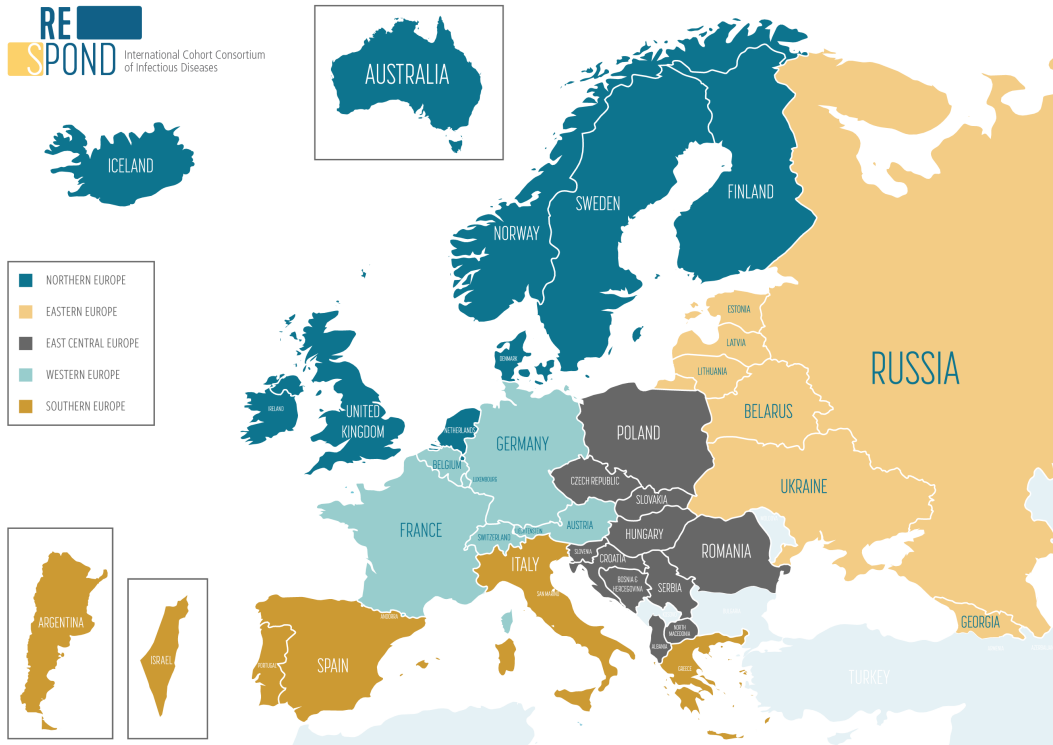
- Tuberculosis (TB) leading infectious cause of death in People with HIV
- High prevalence of TB/HIV co-infections in Eastern Europe
- Targeted clinical and public health interventions can reduce TB-related morbidity and mortality

- Objective: evaluate impact of modifiable risk factors for TB in a European cohort of People with HIV (”RESPOND”) and to calculate their population attributable fractions (PAF)

WHO, Global Tuberculosis Report 2022

Methods

- Longitudinal study of People with HIV aged ≥18 years
- Baseline: the latest of 1/1/2012, or local cohort enrolment
- Follow-up: TB diagnosis, last visit, death or 31/12/2021
- Poisson regression: risk factors for TB
- Calculation of PAF for TB incidence
  - The proportional reduction in population disease that would occur if exposure to a risk factor were reduced to an alternative ideal exposure scenario



For analysis: Eastern Europe vs. Non-Eastern Europe

Methods

- Time independent risk factors
  - Ethnicity
  - Region of Care
  - HIV risk category
  - Prior TB
  - Prior AIDS
- Modifiable and time updated risk factors
  - Smoking status
  - Immunological-virological status (IVS)
    - Poor – CD4 ≤350 cells/mm^3&HIV-RNA>200 copies/mL
    - Intermediate – between poor and good
    - Good – CD4>500 cells/mm^3&HIV-RNA≤200 copies/mL
  - Antiretroviral treatment (ART) – on/off

Results – Baseline Characteristics

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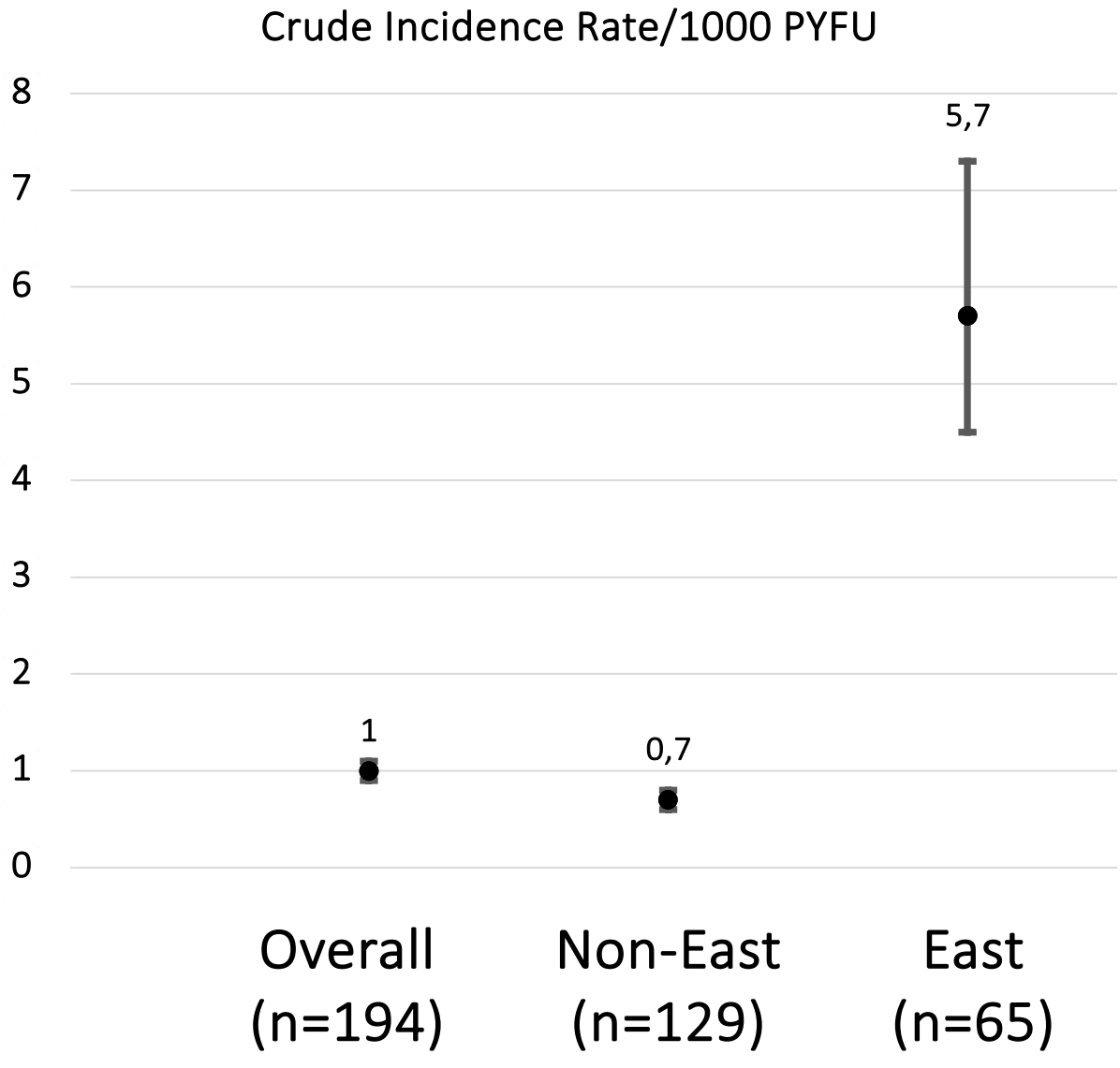
	Overall (n=35332)	Eastern Europe (n=2398)	Non-Eastern Europe (n=32934)
Gender (male)	26328 (74.5%)	1444 (60.2%)	24890 (75.6%)
HIV risk - MSM	15942 (45.1%)	252 (10.5%)	15690 (47.6%)
HIV risk – Injecting drug use (IDU)	4798 (13.6%)	**939 (39.2%)**	3859 (11.7%)
HIV risk - Heterosexual	12316 (34.9%)	1127 (47.0%)	11189 (34.0%)
Prior smoking	11356 (32.1%)	765 (31.9%)	10591 (32.2%)
Prior TB	1554 (4.4%)	170 (7.1%)	1384 (4.2%)
Prior AIDS	7363 (20.8%)	427 (17.8%)	6936 (21.1%)
Baseline IVS - poor (CD4<=350, RNA≥200)	3543 (10.0%)	**543 (22.6%)**	3000 (9.1%)
Baseline IVS - Intermediate	14441 (40.9%)	**1134 (47.3%)**	13307 (40.4%)
Baseline IVS - good (CD4>=500, RNA<200)	17348 (49.1%)	721 (30.1%)	16627 (50.5%)
Baseline ART (off ART)	3133 (8.9%)	**1908 (79.6%)**	2643 (8.0%)

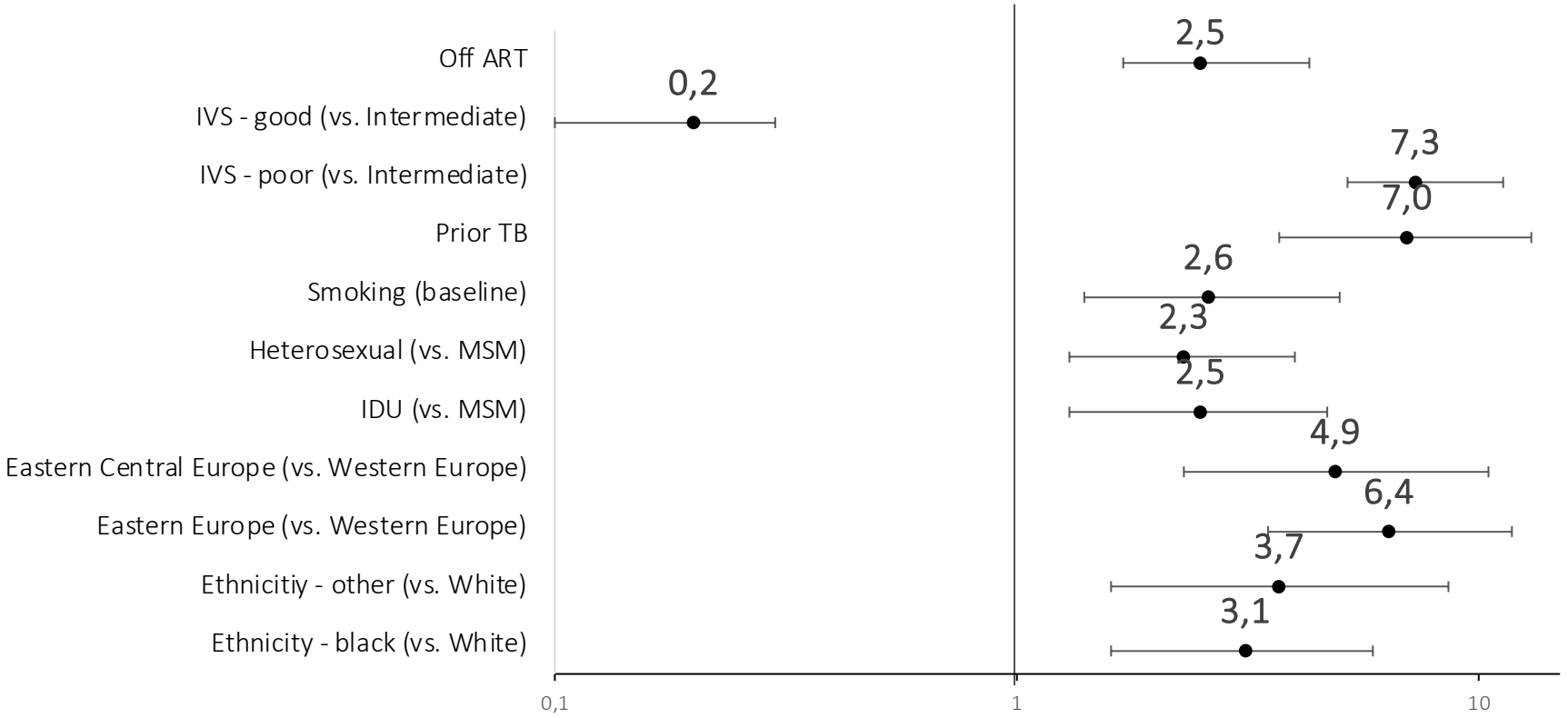
TB incidence rate

- Total of 35.332 People with HIV included
- Overall, 194 TB cases during 197.734 person years of follow-up (PFYU)
- Non-Eastern, 129 TB cases during 186.424 PFYU
- Eastern Europe, 65 TB cases during 11.309 PFYU



Risk factors for TB – overall

adjusted incidence rate ratio (aIRR)



Modifiable risk factors

Poor IVS (aIRR 7,3), smoking (2,6) and being off ART (2,5)

Model adjusted for ethnicity, geographical region of care, HIV-risk category, baseline smoking, prior TB, prior AIDS, immunological status, ART utilization. **The effect of being off ART is partly captured by IVS.**

Risk factors for TB – Eastern Europe vs. non-Eastern Europe

adjusted incidence rate ratio (aIRR)

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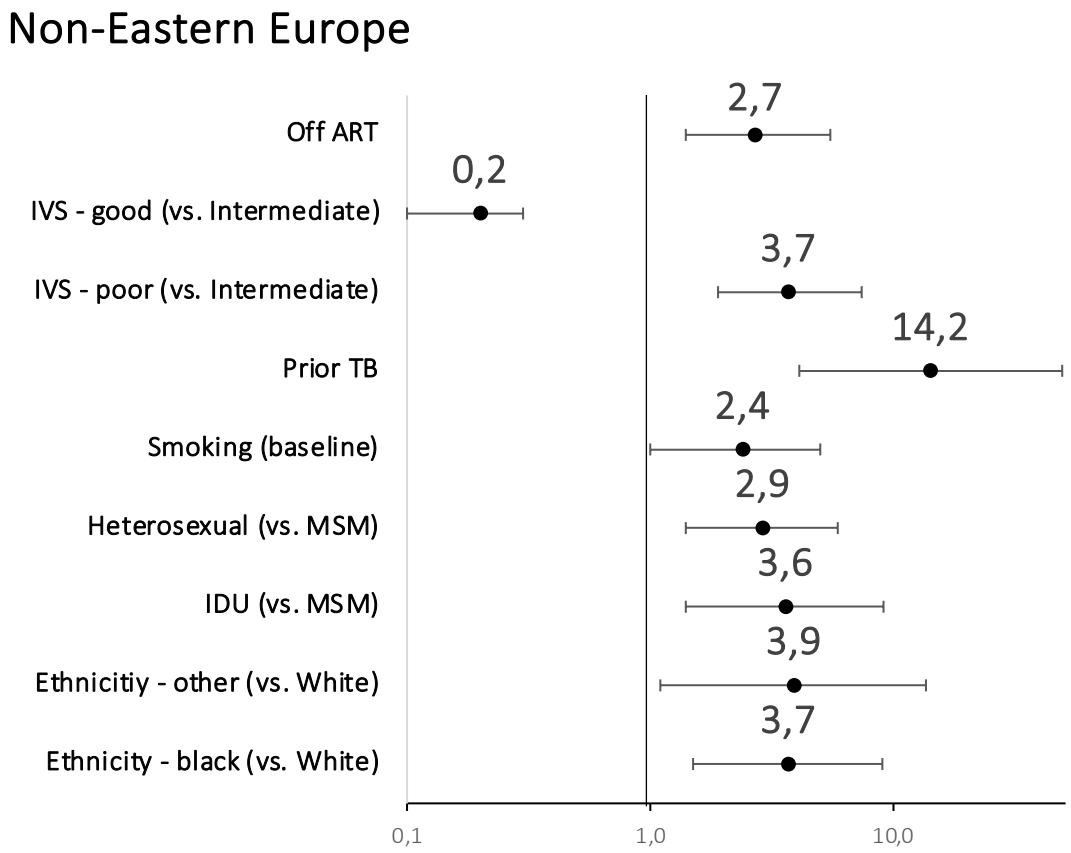
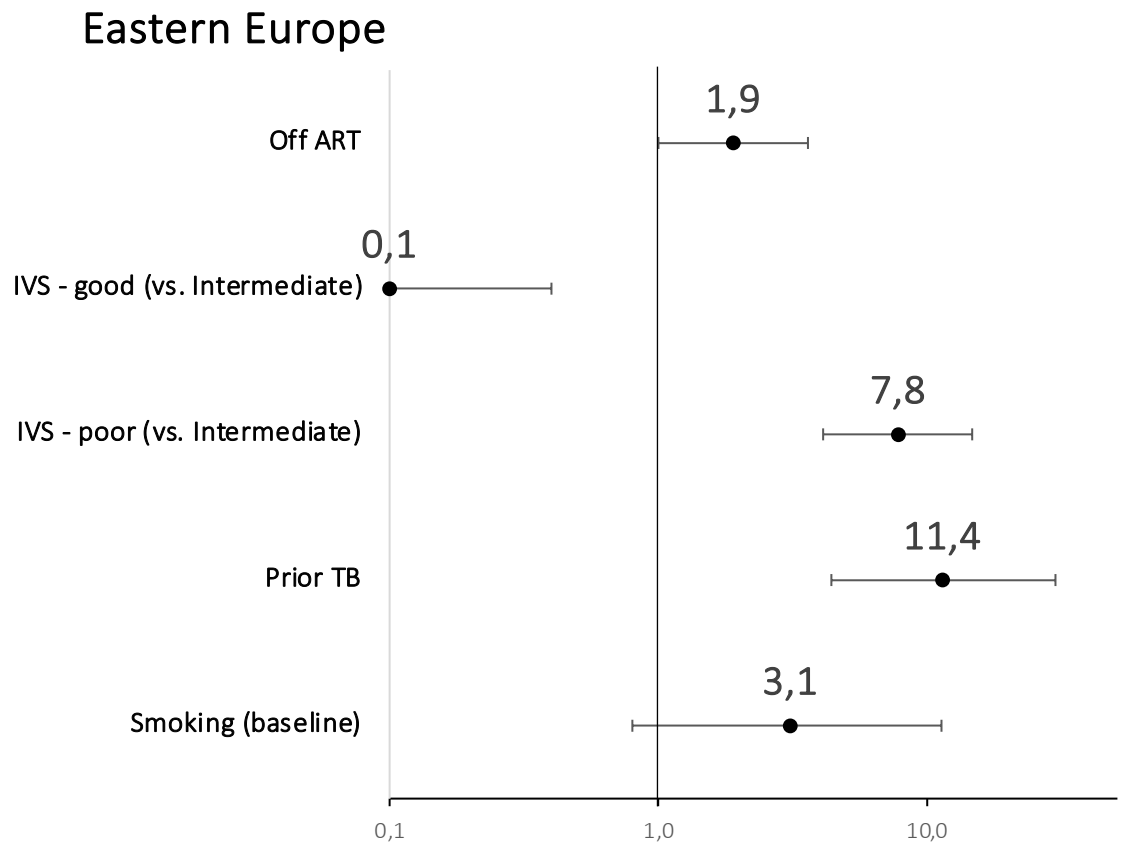
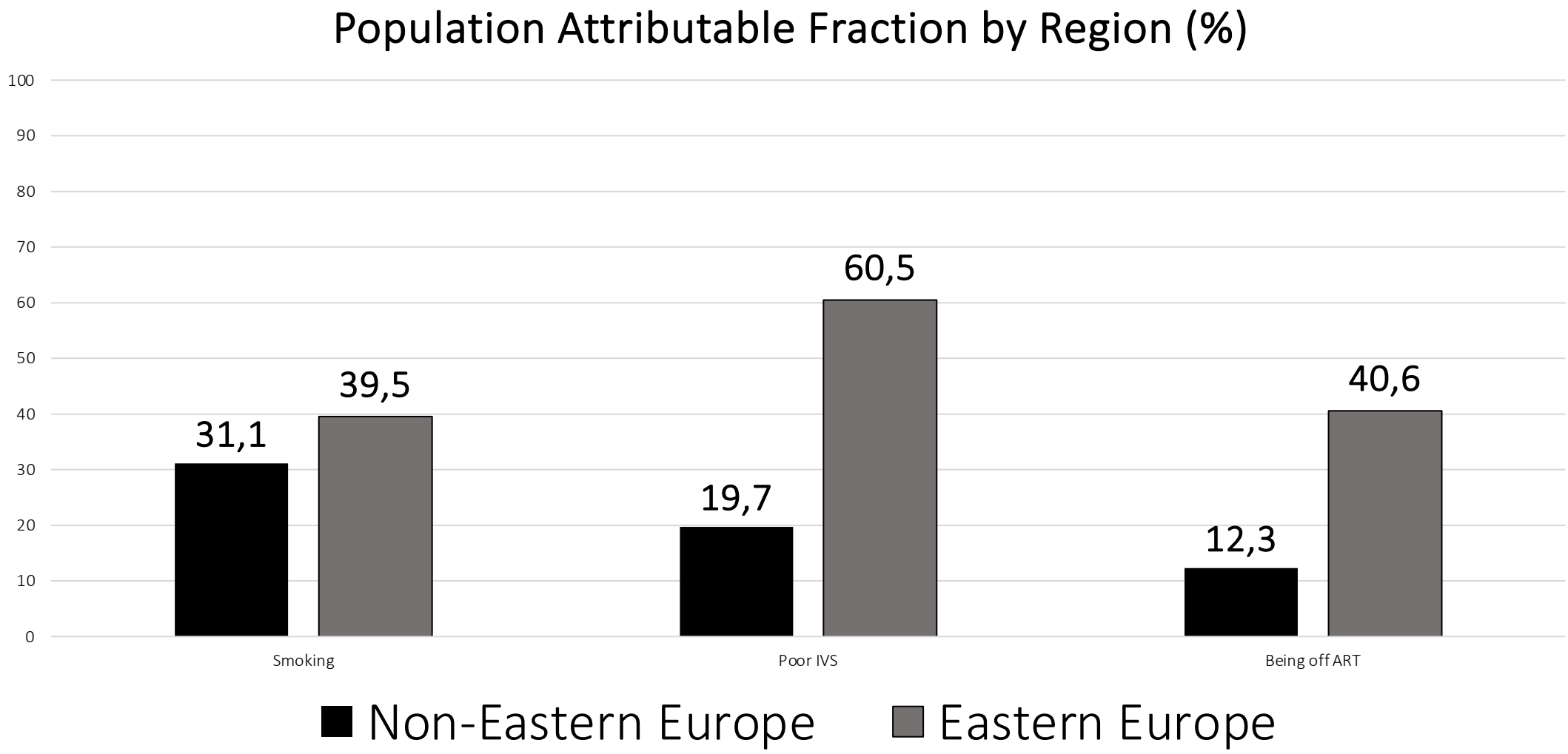




- **Non-Eastern Europe: adjusted for ethnicity, HIV-risk category, baseline smoking, prior TB, prior AIDS, immunological status, ART-coverage.**
- **Eastern Europe: Ethnicity and risk category not included in multivariable model due to very small numbers.**

Poor IVS higher aIRR in Eastern Europe vs. Non-Eastern Europe

Population attributable fractions



Strengths and Limitations

- Large multinational cohort ←→better care may be overrepresented
- Major variables time-updated ←→ low data quality for others (e.g., alcohol intake, resistance, treatment)
- If no HIV-diagnosis before TB diagnosis - not included in the present analysis. Could not investigate the impact of late HIV diagnosis.

Conclusions

- Overall low TB incidence, but much higher in Eastern Europe
- Clinical and public health interventions should target:
  - Smoking prevention
  - Improving ART adherence and poor immunological-virological status (IVS)
    - Specifically in Eastern Europe
- This includes person-centered health care with a focus on early HIV diagnosis, ART, oral substitution therapy and adherence support

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