PROJECTING CHANGES IN DEMOGRAPHICS AND CAUSES OF DEATH AMONG PEOPLE WITH HIV IN WESTERN EUROPE TO 2050: A MATHEMATICAL MODELLING STUDY

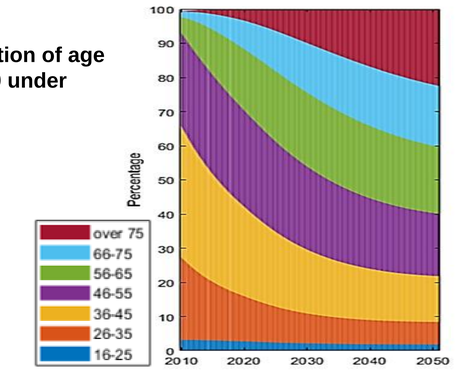
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BACKGROUND

- Antiretroviral therapy (ART) scale-up in Western Europe has reduced the incidence of AIDS-related conditions
- This has increased life expectancies and led to an ageing population of people with HIV (PWH).
- We aimed to predict cause-specific mortality patterns in Western Europe in the context of demographic changes and considering different scenarios of ART use.

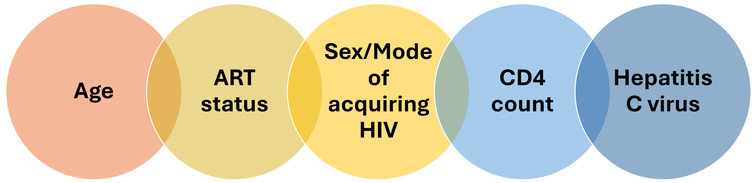
Figure 1. Distribution of age from 2010 to 2050 under status quo



RESULTS

- The % of PWH aged >75 years is projected to triple between 2025 and 2050, from 7% to 22% under SQ (Figure 1).
- Most deaths are projected to occur among PWH aged >75 years.
- With this ageing population (Figure 2), all-cause mortality is projected to rise, driven by an increase in non-AIDS-related causes (Figure 3).
- 2010-2025, AIDS-related deaths declined by 43% (29-63%) under SQ .
- From 2025-2050 80,936 and 15,011 deaths would be averted in S1 and S2 compared with observed deaths under status quo (395,721).

All-cause mortality rates among people with HIV are projected to rise between 2025 and 2050, driven by non-AIDS mortality.



Model Compartments

METHODS

- Deterministic compartmental model, calibrated in a Bayesian framework.
- PWH >16 years enter the model through either acquiring HIV (with a CD4 count of ≥500 and having never been on ART), children who acquired HIV perinatally reaching 16 years, or immigrants with HIV moving to Europe.
- PWH leave the model through death or out-migration.
- Model was parameterised and calibrated using data from ECDC, UNAIDS, and data on cause-specific mortality rates from 11 European cohorts of PWH in the Antiretroviral Therapy Cohort Collaboration

Scenario analysis:

SQ: Status quo assumes existing interventions (e.g. ART initiation rates) were unchanged from 2023 onwards.

S1: From 2025 onwards, everyone immediately starts ART, with nobody stopping ART, and no new HIV infections occur.

S2: From 2025, the ART start rate is 1.5x higher, the rate of stopping ART is halved, and HIV infections decrease by 1,000 each year from 2025 until reaching zero.

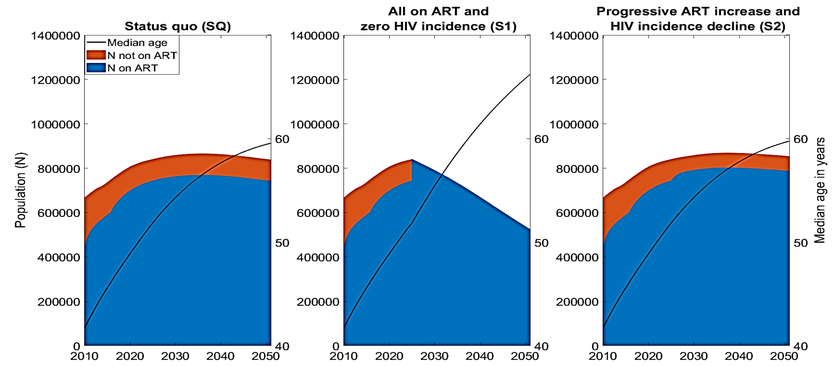


Figure 2. Number of people with HIV in Western Europe by ART status from 2010 to 2050 in the different modelled scenarios

CONCLUSIONS

- Mortality rates are predicted to increase due to an ageing population causing rises in non-AIDS-related mortality.
- Mortality rates due to cardiovascular, cancers, and other age-related causes (e.g. Alzheimer's) are projected to rise.
- Under SQ, AIDS deaths declining by 43% from 2010 to 2025 in W. Europe, is close to the 2025 UNAIDS target of 50% reduction in AIDS-related mortality.
- Policymakers should aim to integrate care for HIV with services focused on a range of other comorbidities**.**

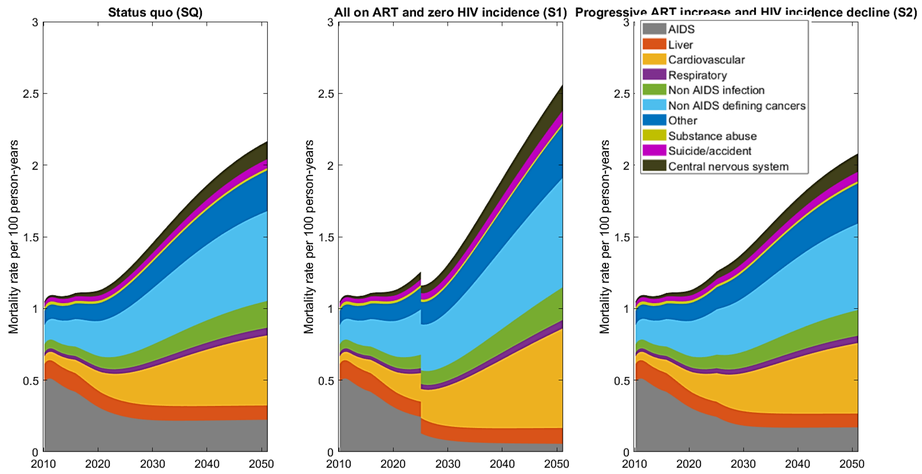


Figure 3. Mortality rate per 100 person-years of each cause of death from 2010-2050 in the different modelled scenarios

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