Ending the Tobacco era

Analysis of smoking trends and policy impact based on OECD data

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Stakeholders and Goals

Analysis on behalf of the OECD

BETTER POLICIES FOR BETTER LIVES

Policy makers of OECD nations

1. **Quantify the effect of national policies** on tobacco smoking, to orient policymakers towards the most effective actions
2. **Characterise gender differences** in the factors affecting smoking prevalence
3. Identify OECD countries more likely to **reach the SDG3** (30% decrease from 2010 to 2025) under BAU (business as usual), and the ones needing more action

General public

Learn recent trends on smoking in the «**Health at a Glance 2023**» report

Dataset

WHO dataset on tobacco for the 37 OECD countries

- **Tobacco smoking prevalence** (total, male, female) for 7 timepoints
- **Data on control and monitoring of tobacco smoking** for 6 timepoints:
  - **Factor variables**: anti-tobacco campaigns, bans on tobacco products, protection from tobacco smoke, help to quit tobacco use, warning about tobacco dangers
  - **Continuous variables**: tax on final cigarette price, cigarette affordability

Other continuous variables from the OECD database

- GDP per capita (constant PPP)
- Education level: % of 25-64 population with tertiary education

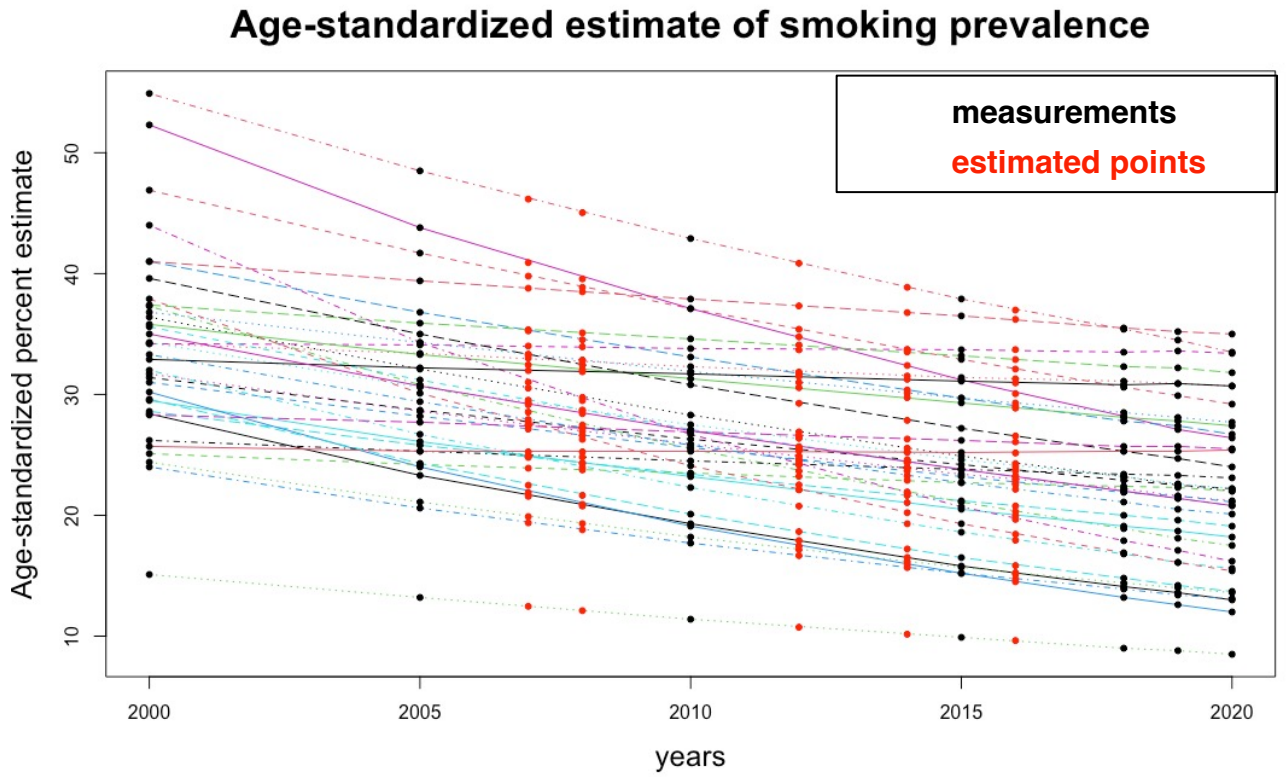
Dataset - preprocessing

Timepoint mismatch between the main covariates and the smoking estimates

Assumption: smoothnes of the smoking prevalence trend in time

Interpolation using **B-splines** to estimate the values for the missing years

Alternative approach to assess reliability of the previous estimates (to be tried soon):
penalised splines



Main methods

- **Exploratory data analysis, preliminary inference and hypothesis testing**
  - **Spearman Correlation** to assess the correlation between variables
  - **Permutational tests** for paired univariate data to test gender differences in smoking prevalence for men and women for each year
  - «Rough» **conformal prediction intervals** (irrespectively of year or country) for smoking prevalence, both overall and for each gender

- **GAM** (or **GAMM**) to estimate the prevalence of tobacco consumption based on the relevant variables. Possibly different models for males and females

- **Permutational tests** to identify variables of relevance to the GAM

- **Conformal prediction intervals** to predict the smoking tobacco prevalence in 2025 to see which countries will reach SDG3 (possibly quantile-based conformal prediction)

Dataset links and References

- WHO dataset on tobacco, data selected for the 37 OECD countries https://apps.who.int/gho/data/node.main.TOBMPOWER?lang=en

- Other datatsets from OECD database https://stats.oecd.org/