

GLOBAL MACROECONOMIC BURDEN OF LEUKEMIA ATTRIBUTABLE TO TOBACCO: A Value-of-Lost-Welfare Analysis Across 184 Countries

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BACKGROUND

- Tobacco exposure is a preventable leukemogenic risk factor, but its macroeconomic consequences for leukemia remain poorly quantified.

- We estimated the country-level and regional value-of-lost-welfare burden of leukemia DALYs attributable to tobacco.

METHODS

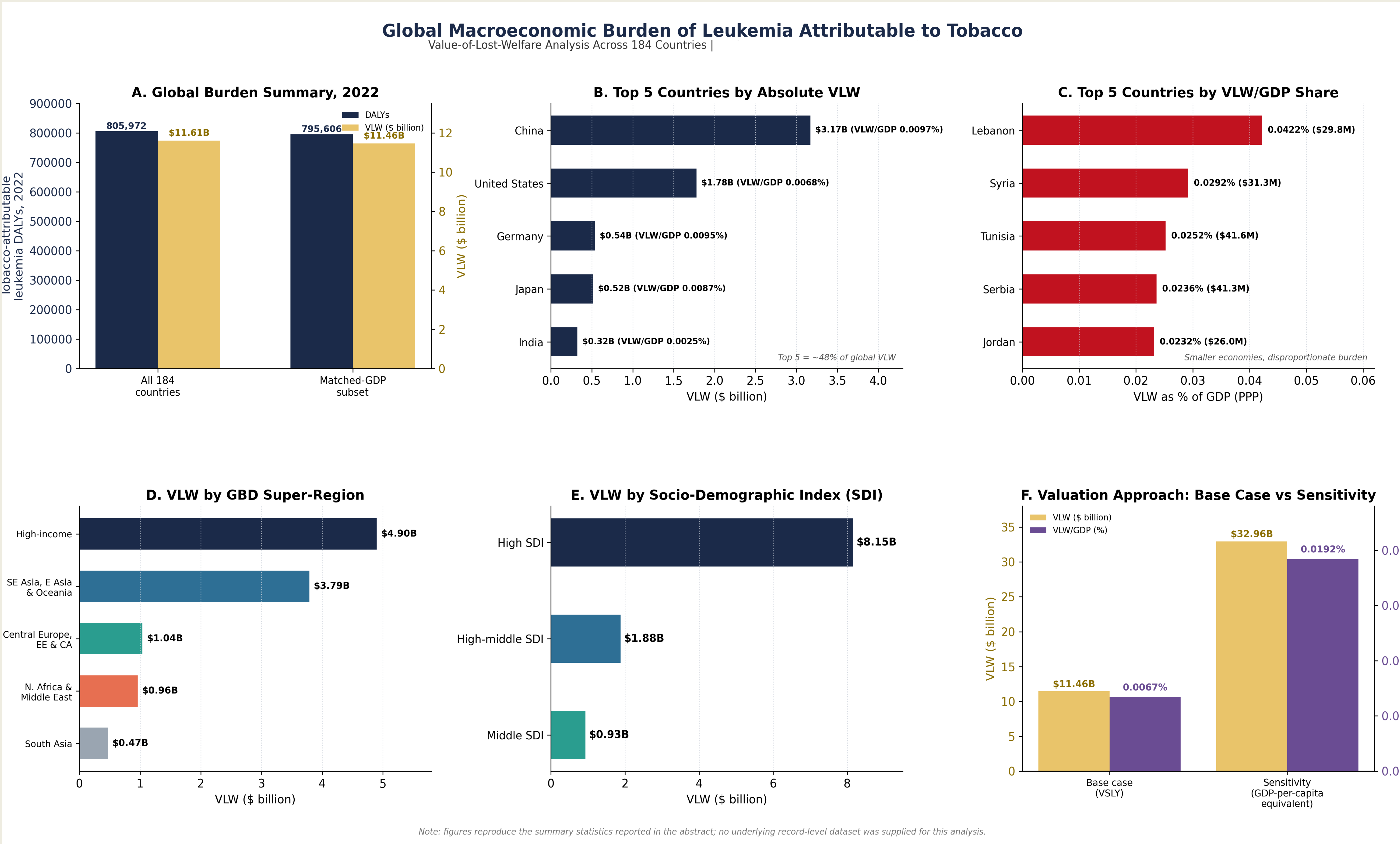
- Tobacco-attributable leukemia DALYs for 2022 were analyzed from the Global Burden of Disease 2023 study across 184 countries.

- GDP and GDP per capita (PPP-adjusted, constant 2017 USD) from the World Bank World Development Indicators were linked to GBD location identifiers to generate country-specific VSL estimates.

- VLW was derived as the product of age-adjusted VSLY and tobacco-attributable leukemia DALYs; VLW/GDP (%) was calculated using PPP-adjusted GDP to enable cross-country comparisons.

RESULTS

- Globally, tobacco-attributable leukemia accounted for 805,972 DALYs in 2022, corresponding to an estimated \$11.61 billion in value of lost welfare (VLW).
- Among 184 countries with matched GDP PPP data, 795,606 DALYs generated \$11.46 billion in VLW, equivalent to 0.0067% of combined GDP PPP; the GDP-per-capita productivity-equivalent sensitivity estimate was \$32.96 billion, or 0.0192% of GDP PPP.
- The highest absolute VLW occurred in China (\$3.17 billion; VLW/GDP 0.0097%), the United States (\$1.78 billion; 0.0068%), Germany (\$535.8 million; 0.0095%), Japan (\$515.7 million; 0.0087%), and India (\$324.4 million; 0.0025%), together accounting for nearly half of the global welfare loss. Countries with the highest VLW/GDP were Lebanon (0.0422%; \$29.8 million), Syria (0.0292%; \$31.3 million), Tunisia (0.0252%; \$41.6 million), Serbia (0.0236%; \$41.3 million), and Jordan (0.0232%; \$26.0 million), indicating that smaller economies may experience disproportionate macroeconomic pressure despite lower absolute losses.
- By GBD super-region, VLW was largest in High-income countries (\$4.90 billion), followed by Southeast Asia, East Asia, and Oceania (\$3.79 billion), Central Europe, Eastern Europe, and Central Asia (\$1.04 billion), North Africa and Middle East (\$0.96 billion), and South Asia (\$0.47 billion).
- By SDI, High SDI accounted for \$8.15 billion, followed by High-middle SDI (\$1.88 billion) and Middle SDI (\$0.93 billion).



CONCLUSION

Leukemia DALYs attributable to tobacco impose measurable global welfare losses, concentrated in large economies by absolute VLW and in several Middle Eastern and Balkan settings by GDP share. These findings support tobacco-control enforcement as an economic as well as cancer-prevention priority.

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