

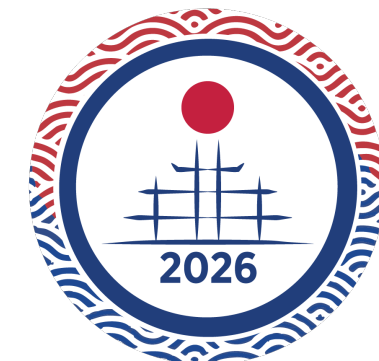


P3.018: China Leads the Global Lung Cancer Burden: Trends in Incidence, Mortality and Risk Factors, 1990–2023

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INTRODUCTION

China bears the largest lung cancer burden of any country in the world.

- Lung cancer is the leading cause of cancer mortality worldwide, and its burden is disproportionately concentrated in China.
- China's epidemic is shaped by high male smoking prevalence, heavy ambient air pollution, occupational exposures and a large, rapidly ageing population.
- Characterising temporal trends and risk-attributable burden in China is therefore central to understanding the global lung cancer landscape.

OBJECTIVE

To describe lung cancer incidence, mortality and risk-factor–attributable mortality in China from 1990 to 2023, benchmarked against global estimates.

METHODS

POPULATION AND SETTING

All ages and both sexes in China, with global estimates and 204 countries and territories as comparators.

MEASURES

- Incident cases and deaths
- Age-standardised incidence and mortality rates (ASIR, ASMR) per 100,000
- Percent change, 1990–2023, with 95% uncertainty intervals
- Risk-attributable mortality via the GBD comparative risk assessment framework

ANALYSIS

Stratified by sex; a change was significant if its 95% uncertainty interval excluded zero. Analyses in R 4.5.1.

GBD 2023

Global Burden of Disease Study 2023 estimates, 1990–2023

Population

All ages and both sexes in China; global estimates and 204 countries and territories as comparators

Outcomes

Incident cases, deaths, ASIR and ASMR per 100,000; risk-factor–attributable mortality

Analysis

1990–2023 percent change with 95% UI, by sex

LIMITATIONS

GBD modelled estimates. Stage at diagnosis, histology, molecular subtype and treatment access are unavailable; risk-factor data are population-level rather than individual-level; and national estimates mask subnational variation.

RESULTS

BURDEN IN 2023 (Figures 1–2)

- 872,463 incident cases (599,327 males; 273,136 females) and 763,723 deaths (527,627 males; 236,096 females) — the leading cancer in China and ranked first among 204 countries and territories.
- 37.7% of global incident cases and 37.5% of global deaths, exceeding the combined totals of the countries ranked 2–12 for incidence and 2–13 for mortality.

TRENDS, 1990–2023 (Figure 3)

- Cases rose 174% (95% UI 114 to 244) and deaths 147% (91 to 215), with larger increases in males.
- Age-standardised rates did not improve: ASIR +1% (–21 to 27) and ASMR –11% (–31 to 12), while global ASIR fell 14% (–23 to –6) and global ASMR 20% (–29 to –13).
- 2023 ASIR 37.3 per 100,000 (53.3 males; 22.3 females; global 25.1; rank 20th); ASMR 32.9 (47.5; 19.5; global 22.2; rank 22nd).

China holds over a third of the world's burden

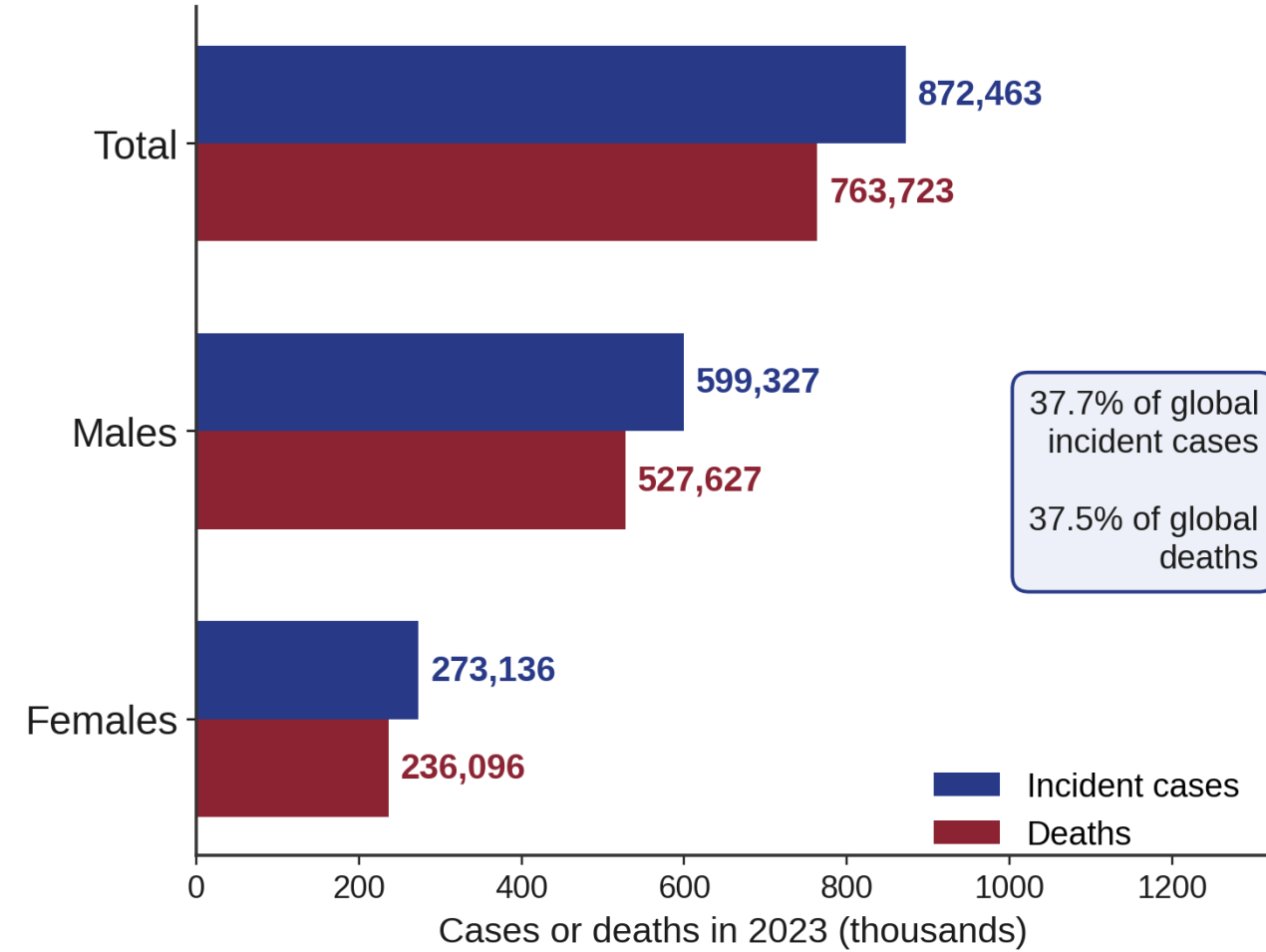


Figure 1. Lung cancer incident cases and deaths in China by sex, 2023, with China's share of the global total.

Rates exceed the global average, with a male excess

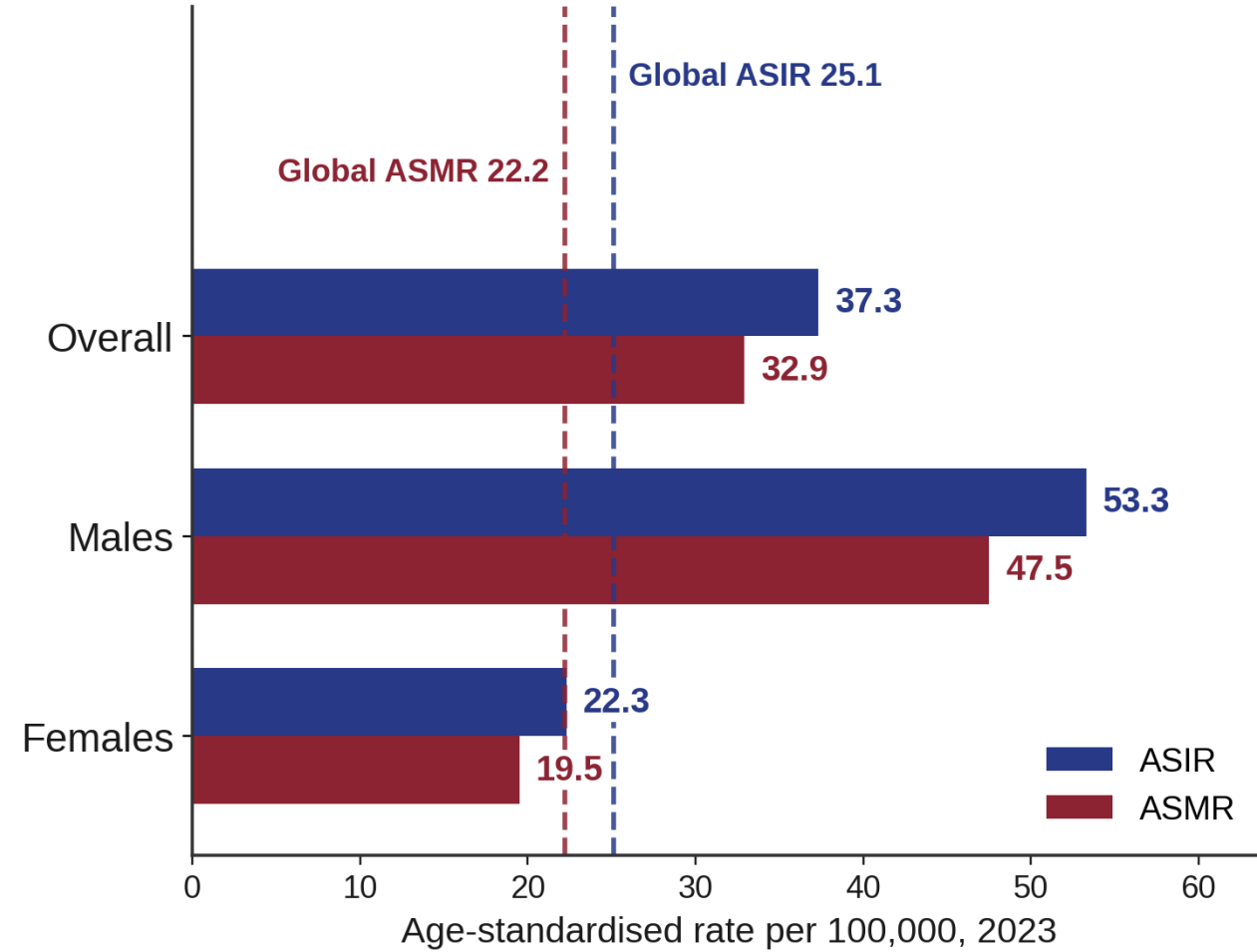


Figure 2. Age-standardised incidence and mortality rates in China, 2023, against global rates (dashed).

Absolute burden soared while age-standardised rates held flat

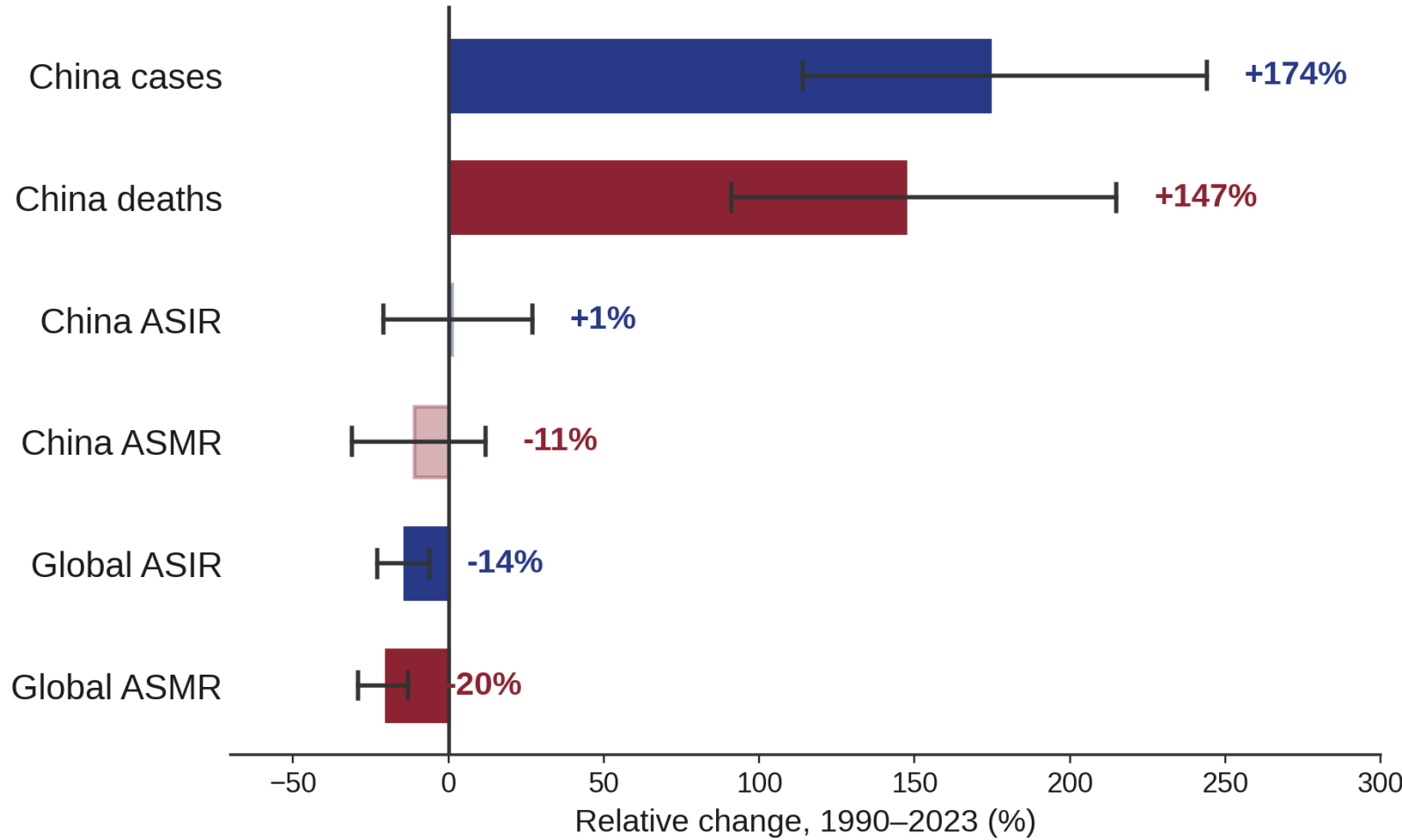


Figure 3. Percent change 1990–2023 in burden and age-standardised rates, China versus global. Whiskers are 95% uncertainty intervals; faded bars indicate intervals crossing zero.

RISK FACTOR TRANSITIONS (Figures 4–5)

- 90% of male and 61% of female deaths were attributable to modifiable risks, led by smoking (82% males; 26% females) with secondhand smoke adding 8% and 14%. Environmental/occupational risks accounted for 33% in both sexes, driven by ambient particulate matter (22%).
- Attributable deaths fell 2% in males and 15% in females. Household air pollution collapsed (–94%; –91%) while ambient particulates (+132%; +207%) and occupational carcinogens (+17%; +21%) rose; tobacco remained stable and secondhand smoke declined only in females (–17%).

Attributable fraction of lung cancer deaths, China 2023

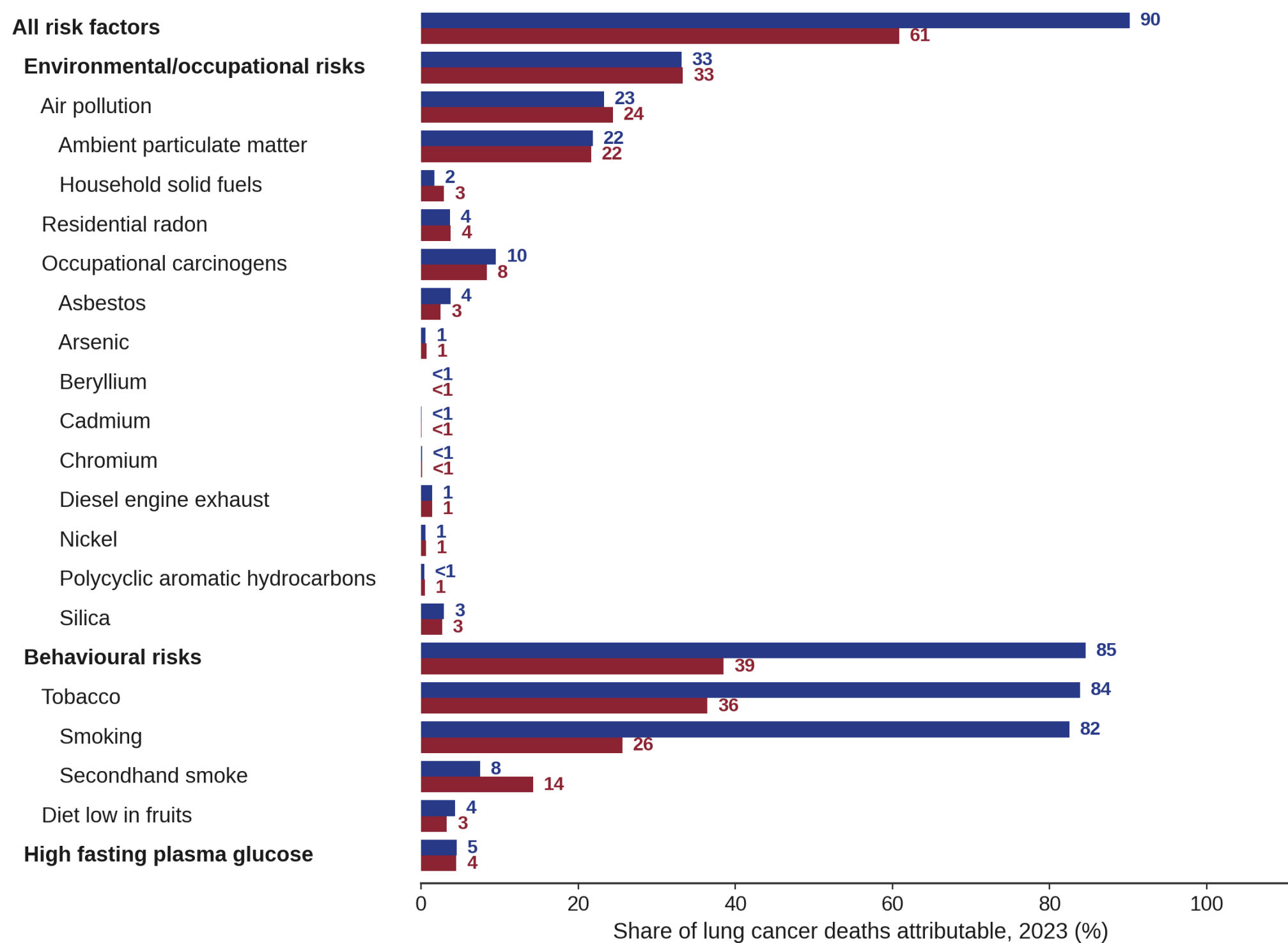


Figure 4. Attributable fraction of lung cancer deaths in China, 2023. Smoking dominates in males; environmental and occupational risks are equal across sexes.

Change in risk-attributable mortality, China 1990–2023

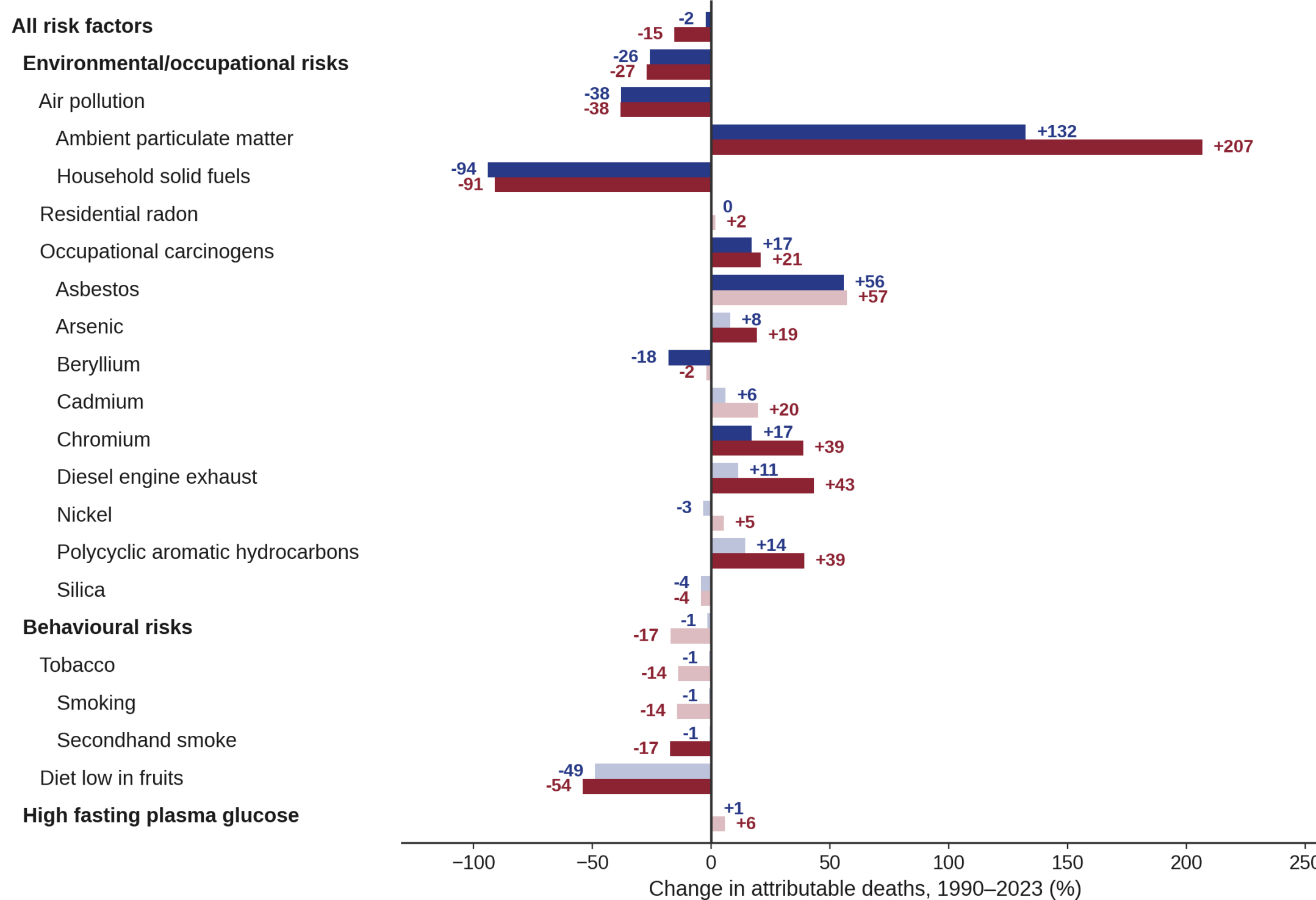


Figure 5. Change in risk-attributable mortality, 1990–2023. Ambient PM and occupational carcinogens rose; household air pollution nearly disappeared. Faded bars indicate 95% UIs crossing zero.

ASIR = age-standardised incidence rate; ASMR = age-standardised mortality rate; UI = uncertainty interval; PM = particulate matter. All rates per 100,000 population. Source: Global Burden of Disease Study 2023.

DISCUSSION AND CONCLUSION

KEY TAKEAWAYS

↑ **SCALE** — China alone accounts for 37.7% of global incident cases and 37.5% of global deaths — more than the next 11–12 highest-burden countries combined.

↔ **AGE-STANDARDISED RATES** — Absolute burden nearly tripled while ASIR and ASMR stayed flat; global rates fell over the same period.

↑ **TOBACCO** — 82% of male lung cancer deaths remain attributable to smoking, and tobacco-attributable mortality has not declined.

↓ **HOUSEHOLD AIR POLLUTION** — Near-eliminated (–94% males; –91% females), the clearest public-health gain of the period.

↑ **AMBIENT AND OCCUPATIONAL RISK** — Ambient particulate matter (+132%; +207%) and occupational carcinogens (+17%; +21%) rose.

China's burden is growing in absolute terms with no improvement in underlying risk: tobacco control remains the largest lever, with air quality and the workplace now close behind.

FUTURE DIRECTIONS FOR RESEARCH

- Disaggregate the female and never-smoker burden by histology and driver alterations (EGFR, ALK), which GBD cannot capture.
- Model the mortality gains achievable from combined tobacco control and PM_{2.5} abatement targets, and quantify the occupational contribution independent of tobacco.
- Test whether risk-based low-dose CT criteria should incorporate ambient and occupational exposures alongside smoking history.

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Data sharing

All results are publicly accessible via the GBD Results tool: <https://vizhub.healthdata.org/gbd-results/>

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AI Use Disclosure

AI tools were used for layout of the poster. All scientific content, analyses and conclusions are the authors' own.

