# Diet high in trans fatty acids—Level 3 risk

**Summary** In 2019, a diet high in trans fatty acids was responsible for 14·2 million (95% UI 1·58–19·4) DALYs and 645 000 deaths (75 900–882 000). It was the seventh-leading dietary risk factor for attributable DALYs.

**Definition** Diet high in trans fatty acids is defined as any intake (in percentage daily energy) of trans fat from all sources, mainly partially hydrogenated vegetable oils and ruminant products.

| | Total sources |
|---|---|
| Exposure | 924 |
| Relative risk | 10 |

*Table 1:* Total sources used in GBD 2019 estimation

## What is new in GBD 2019?

- The method of bias adjustment for non-dietary recall surveys was updated using MR-BRT, generally decreasing estimates of trans fat intake.
- We updated the dose–response curve of relative risk for trans fat and ischaemic heart disease based on the most recent epidemiological evidence and a newly developed method for characterising the risk curve.
- The trans fatty acids TMREL changed from 0·5% to 0% daily energy.

| | Deaths | | YLLs | | YLDs | | DALYs | |
|---|---|---|---|---|---|---|---|---|
| | Number (millions) | Rate (per 100 000) | Number (millions) | Rate (per 100 000) | Number (millions) | Rate (per 100 000) | Number (millions) | Rate (per 100 000) |
| **2019** | | | | | | | | |
| Both sexes | 0·645 (0·0759 to 0·882) | 8·2 (1·0 to 11·3) | 13·8 (1·54 to 18·9) | 169·2 (18·8 to 231·2) | 0·385 (0·0413 to 0·627) | 4·7 (0·5 to 7·7) | 14·2 (1·58 to 19·4) | 173·9 (19·4 to 237·3) |
| Females | 0·283 (0·0390 to 0·396) | 6·5 (0·9 to 9·0) | 5·18 (0·658 to 7·11) | 119·3 (15·1 to 163·7) | 0·175 (0·0213 to 0·289) | 4·0 (0·5 to 6·6) | 5·35 (0·678 to 7·36) | 123·3 (15·6 to 169·6) |
| Males | 0·362 (0·0396 to 0·498) | 10·3 (1·1 to 14·1) | 8·67 (0·912 to 11·9) | 222·4 (23·6 to 305·5) | 0·210 (0·0203 to 0·340) | 5·5 (0·5 to 8·9) | 8·88 (0·933 to 12·2) | 228·0 (24·1 to 312·8) |
| **Percentage change 2010–19** | | | | | | | | |
| Both sexes | 18·3% (11·7 to 24·8) | −9·8% (−14·6 to −5·1) | 13·4% (6·0 to 20·7) | −9·9% (−15·7 to −4·2) | 27·7% (24·4 to 31·6) | −0·5% (−3·1 to 2·3) | 13·8% (6·5 to 20·9) | −9·6% (−15·4 to −4·1) |
| Females | 20·1% (11·7 to 28·3) | −9·4% (−15·6 to −3·1) | 16·6% (6·8 to 26·5) | −8·4% (−16·2 to −0·5) | 27·8% (23·2 to 32·5) | −0·3% (−4·0 to 3·6) | 17·0% (7·4 to 26·6) | −8·1% (−15·6 to −0·5) |
| Males | 17·0% (8·6 to 25·4) | −10·2% (−16·2 to −4·1) | 11·6% (2·7 to 20·7) | −10·6% (−17·6 to −3·6) | 27·7% (23·3 to 32·9) | −0·9% (−4·2 to 2·6) | 11·9% (3·3 to 21·0) | −10·4% (−17·2 to −3·5) |

Numbers in parentheses are 95% uncertainty intervals.

*Table 2:* Attributable global deaths, YLLs, YLDs, and DALYs in counts and age-standardised rates for both sexes combined, females, and males, 2019, with percentage change between 2010 and 2019

| | Deaths | YLLs | YLDs | DALYs |
|---|---|---|---|---|
| 1990 | 25th | 29th | 42nd | 32nd |
| 2010 | 25th | 28th | 41st | 33rd |
| 2019 | 23rd | 25th | 41st | 30th |

*Table 3:* Rank among attributable Level 3 risks plus most detailed Level 2 risks of global deaths, YLLs, YLDs, and DALYs in 1990, 2010, and 2019 for both sexes combined

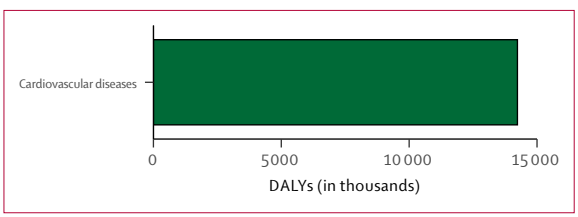


*Figure 1:* Composition of attributable global DALYs by constituent Level 2 causes for both sexes combined, 2019

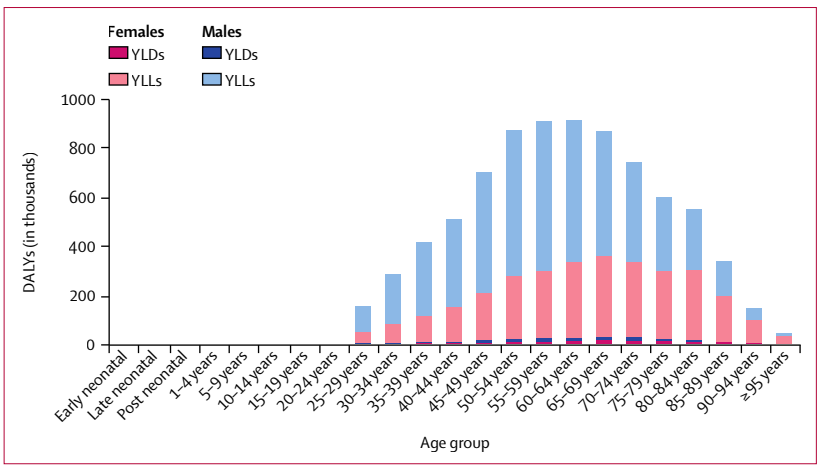


*Figure 2:* Composition of attributable global DALYs by YLLs and YLDs, age group, and sex, 2019

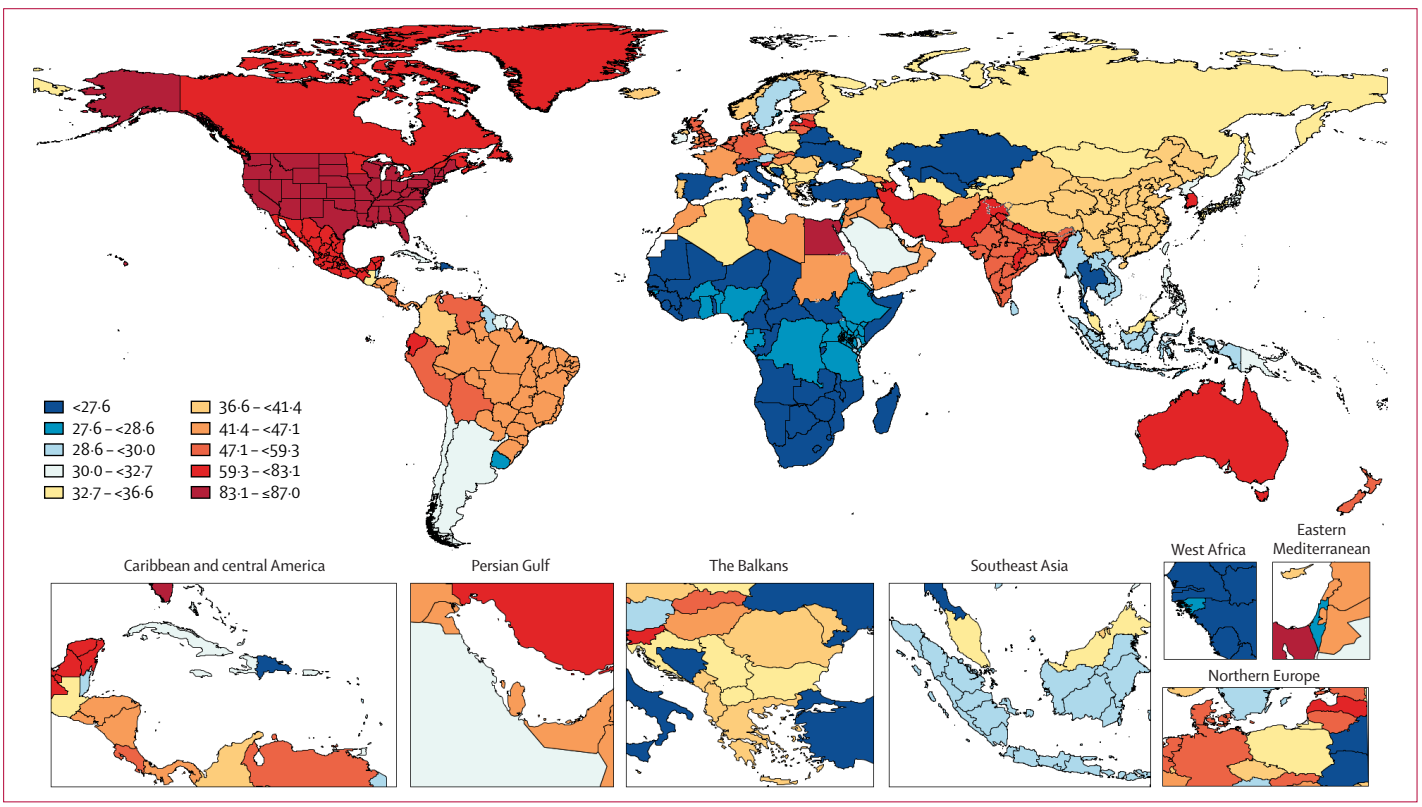


*Figure 3:* **Age-standardised all-cause SEV by location, both sexes combined, 2019**

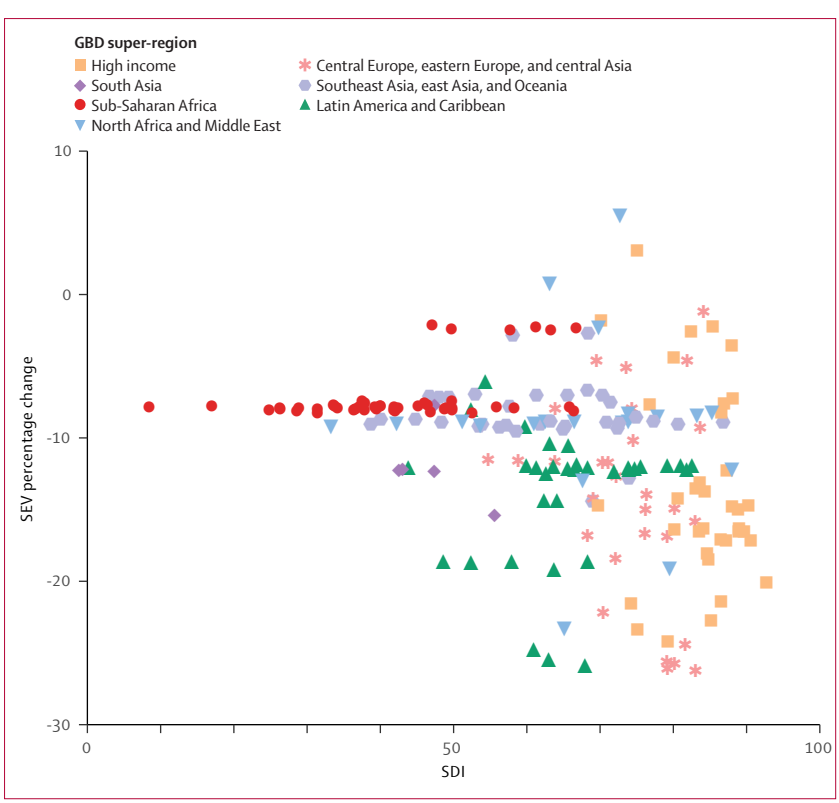


*Figure 4:* **Percentage change in all-cause age-standardised SEV by SDI, both sexes combined, 1990–2019**

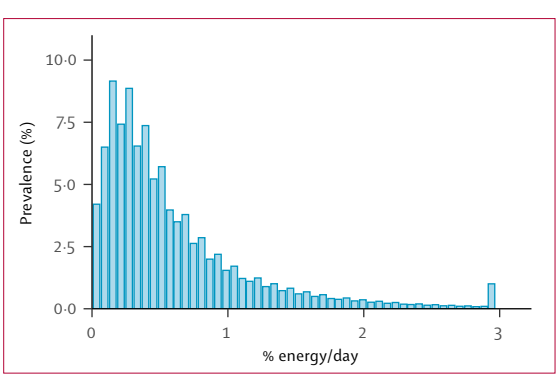


*Figure 5:* **Percentage of population exposed to risk factor, both sexes combined, 2019**

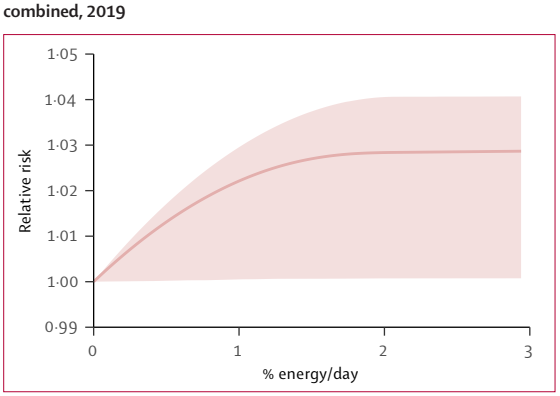


*Figure 6:* **All-cause mortality relative risk, both sexes combined, 2019**