BURDEN 2020

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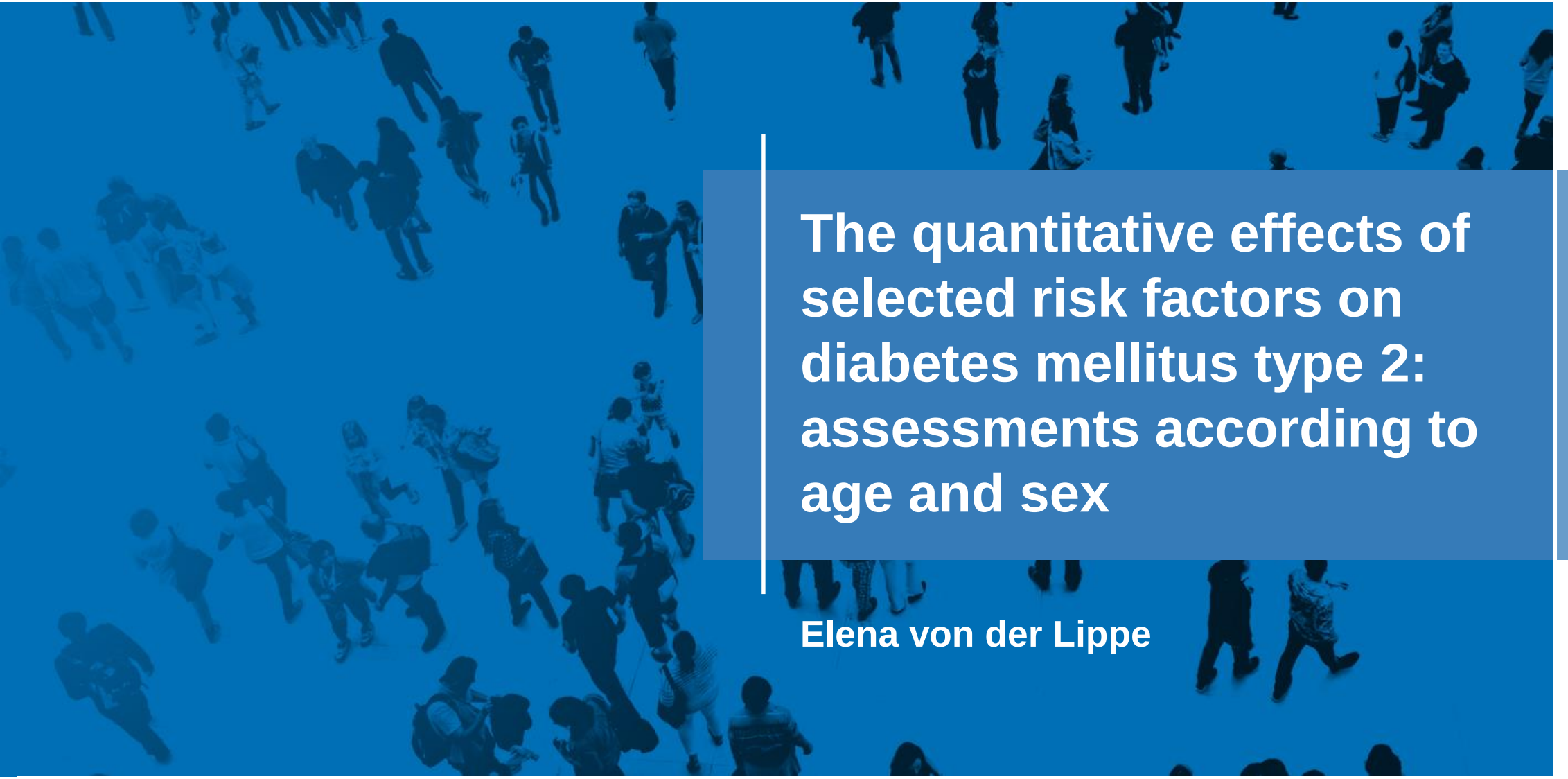


The quantitative effects of selected risk factors on diabetes mellitus type 2: assessments according to age and sex

Elena von der Lippe

Background

- About 12% of the population in Germany has diagnosed diabetes
- Constant increase in the last years, more than 500 000 people get newly diagnosed each year
- Sharp increase with age: prevalence of 1,5% in age groups 30-39 y:
  9,8 % in age groups 50-59 y
  33,1 % in ages 80 + years

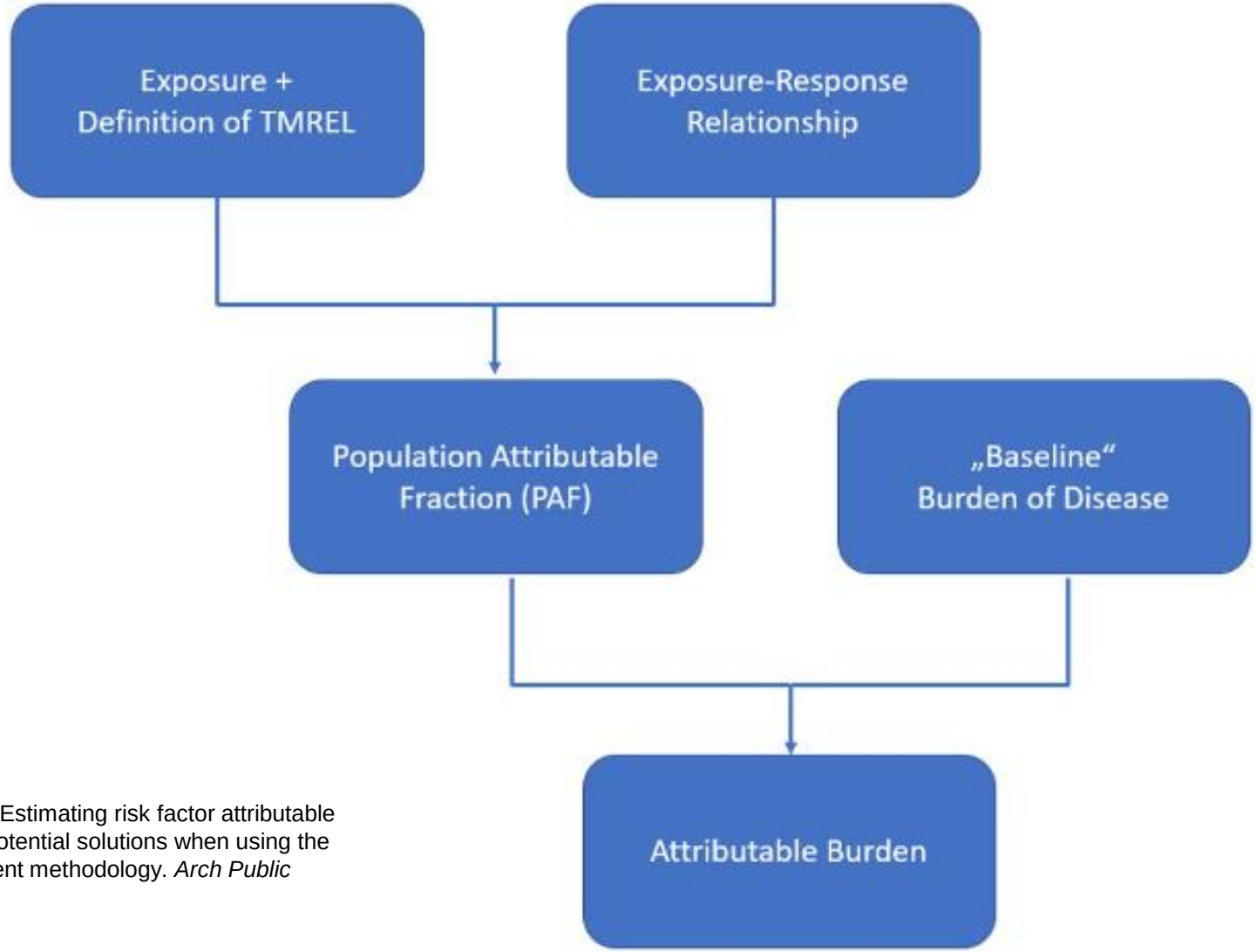
Background

- The attributable burden of disease describes the **proportion** of the disease burden of a condition that is due to a previous exposure to a risk factor.
- Many of the prevalent disease cases are attributable to **preventable** risk factors
- Estimating of risk attribution provides information on potential health gains from reducing certain risk factors

Aims of the study

- To quantify the association between a set of risk factors and the burden of diabetes type 2
- Burden of diabetes is measured as YLL, YLD and DALY due to diabetes type 2
- Risk factors included: smoking, high body-mass index (BMI), diet low in fruits, risk alcohol consumption, low physical activity, high fasting plasma glucose and ambient particulate matter pollution

Riskattribution



Source: **Plass et al**. 2022. Estimating risk factor attributable burden – challenges and potential solutions when using the comparative risk assessment methodology. *Arch Public health* 80, 148

Risk factors for diabetes in BURDEN 2020

Risk factors	Data source
BEHAVIORAL RISKS	
Smoking	GEDA – gepoolt
Alcohol use	DEGS
Diet low in fruits	DEGS
METABOLIC RISKS	
High BMI	GEDA – gepoolt
High fasting plasma glucose	DEGS
ENVIRONMENTAL RISKS	
Ambient particulate matter pollution	UBA

Smoking PAF estimation

Population attributable fraction (PAF)

As in GBD 2017, we estimated PAFs based on the following equation:

$$PAF = \frac{p(n) + p(f) \int \exp(x) * rr(x) + p(c) \int \exp(y) * rr(y) - 1}{p(n) + p(f) \int \exp(x) * rr(x) + p(c) \int \exp(y) * rr(y)}$$

where $p(n)$ is the prevalence of never smokers, $p(f)$ is the prevalence of former smokers, $p(c)$ is the prevalence of current smokers, $\exp(x)$ is a distribution of years since quitting among former smokers, $rr(x)$ is the relative risk for years since quitting, $\exp(y)$ is a distribution of cigarettes per smoker per day or pack-years, and $rr(y)$ is the relative risk for cigarettes per smoker per day or pack-years.

We used pack-years as the exposure definition for cancers and chronic respiratory diseases, and cigarettes per smoker per day for cardiovascular diseases and all other health outcomes.

Combined PAF estimation

$$PAF_{combi} = 1 - \prod_i (1 - PAF_i)$$

PAFs (both sexes)

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	smoking	risk alcohol consumption	BMI	low fruit comsumption
15-19 y	0,094	0,000	0,339	0,062
20-24 y	0,125	0,001	0,436	0,060
25-29 y	0,150	0,004	0,545	0,064
30-34 y	0,148	0,003	0,598	0,054
35-39 y	0,144	0,001	0,613	0,054
40-44 y	0,152	0,002	0,597	0,048
45-49 y	0,157	0,002	0,580	0,037
50-54 y	0,141	0,004	0,578	0,033
55-59 y	0,136	0,003	0,568	0,026
60-64 y	0,094	0,002	0,542	0,019
65-69 y	0,072	0,004	0,489	0,017
70-74 y	0,047	0,004	0,456	0,013
75-79 y	0,031	0,002	0,406	0,011
Total	**0,118**	**0,003**	**0,511**	**0,046**

DALY DT2 attributable to smoking

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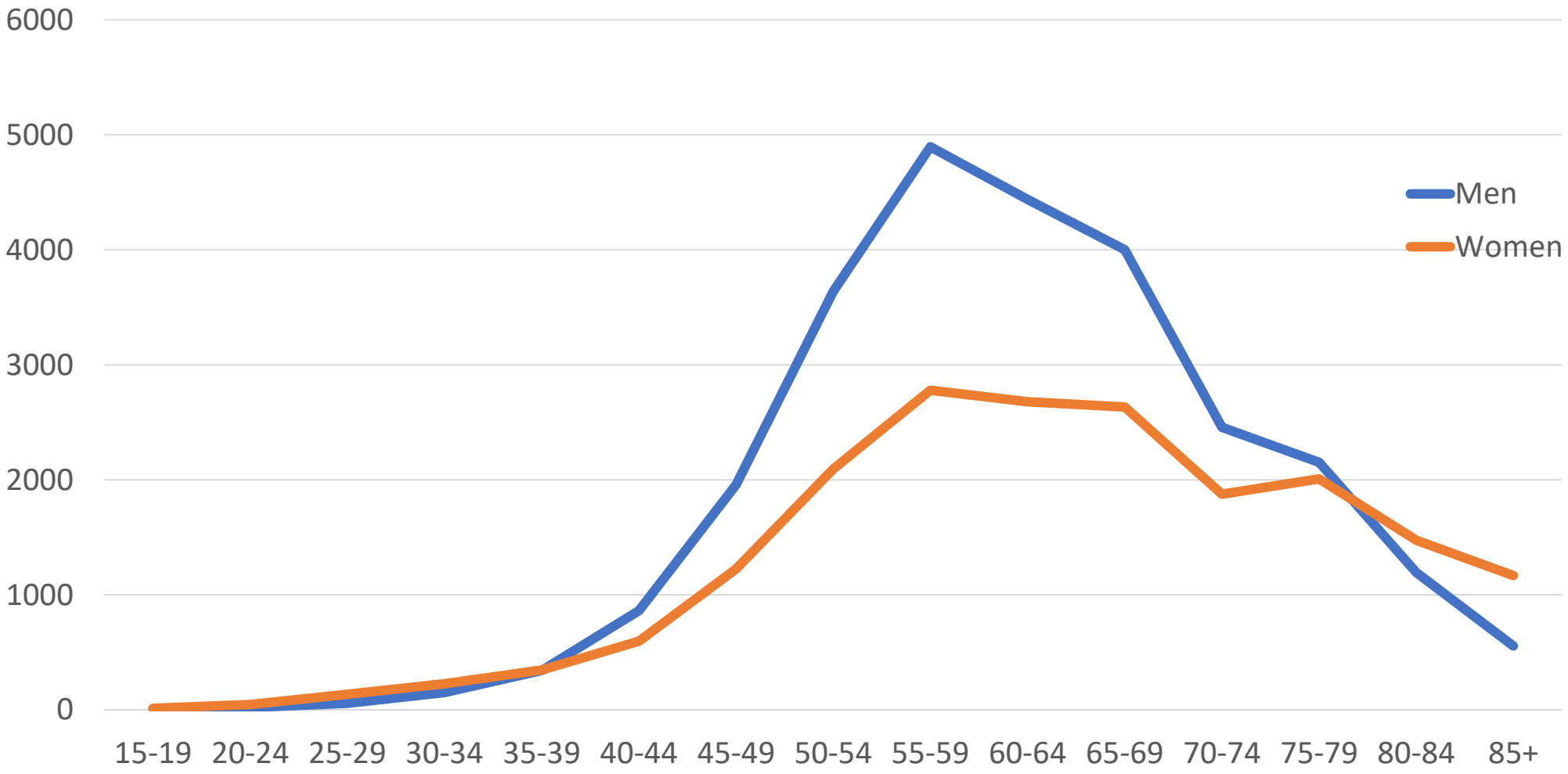
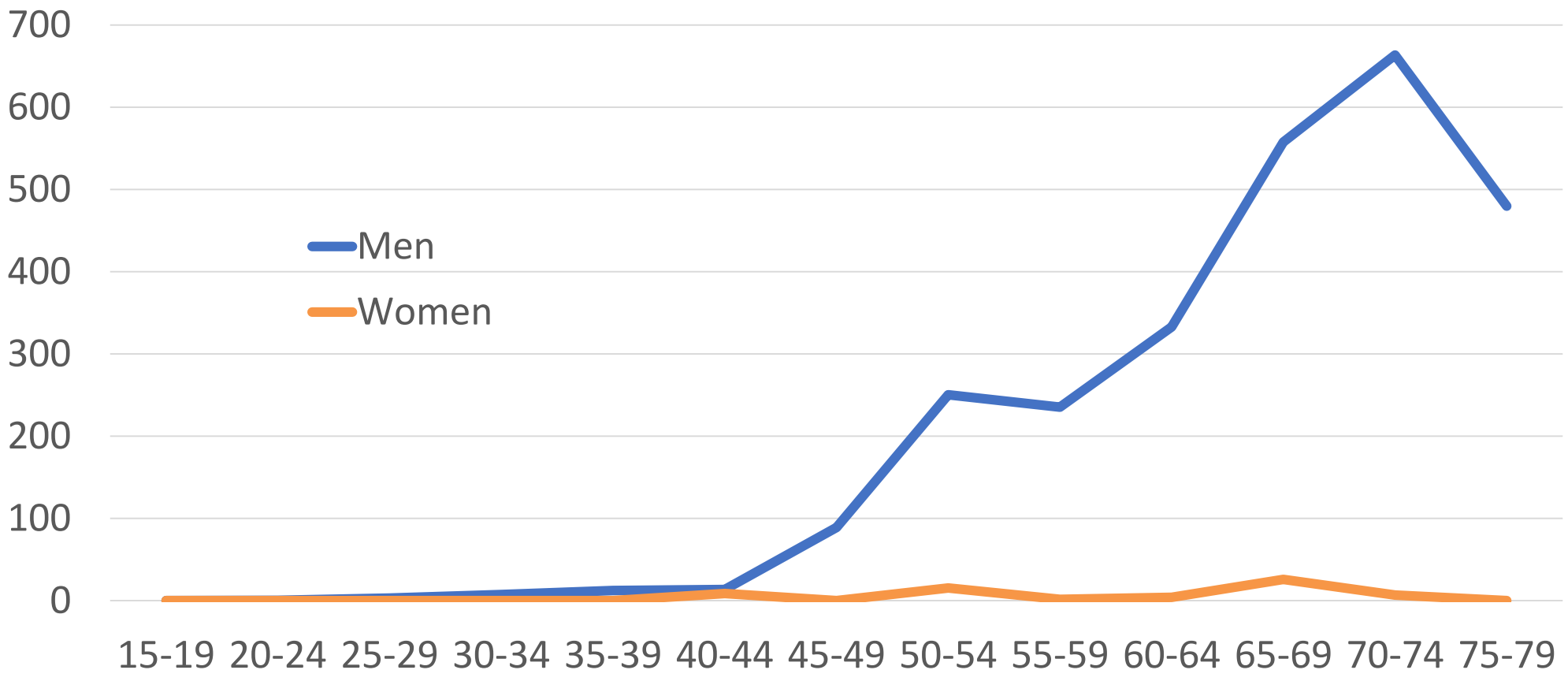
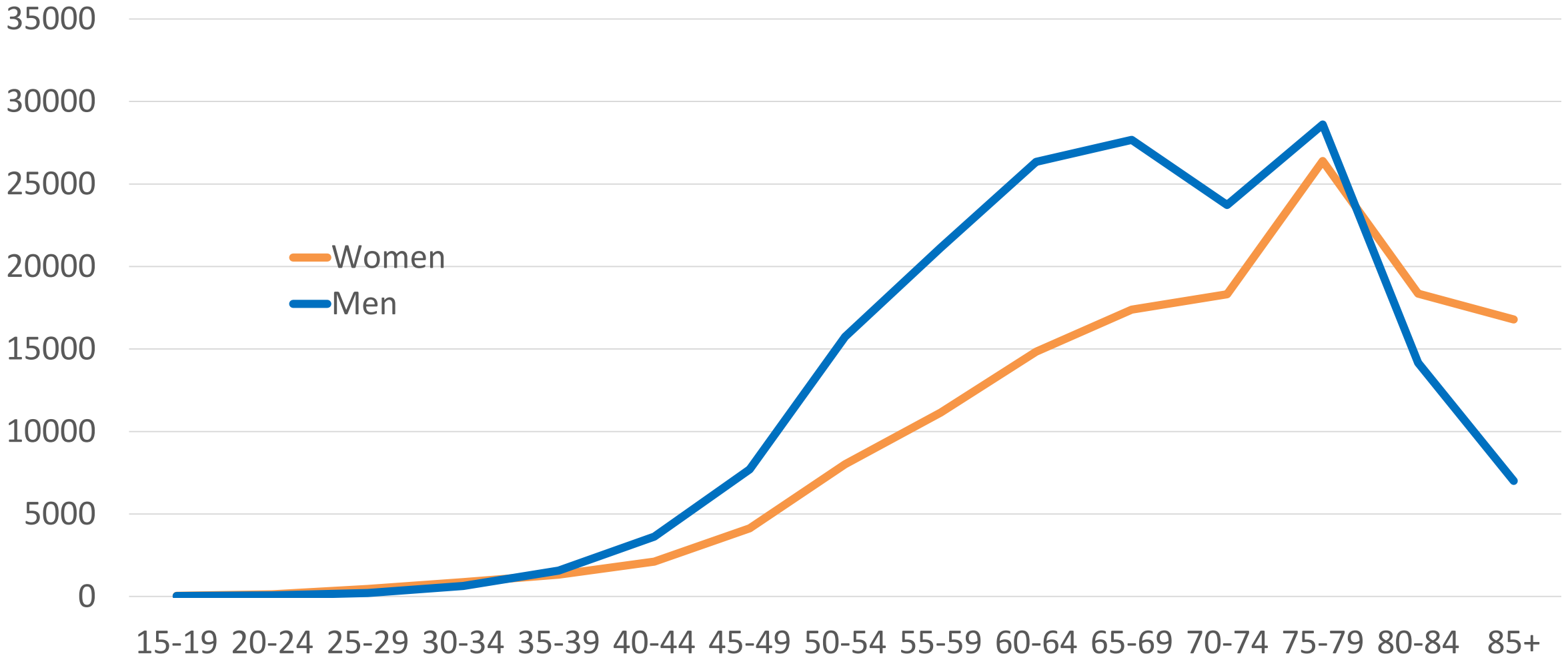


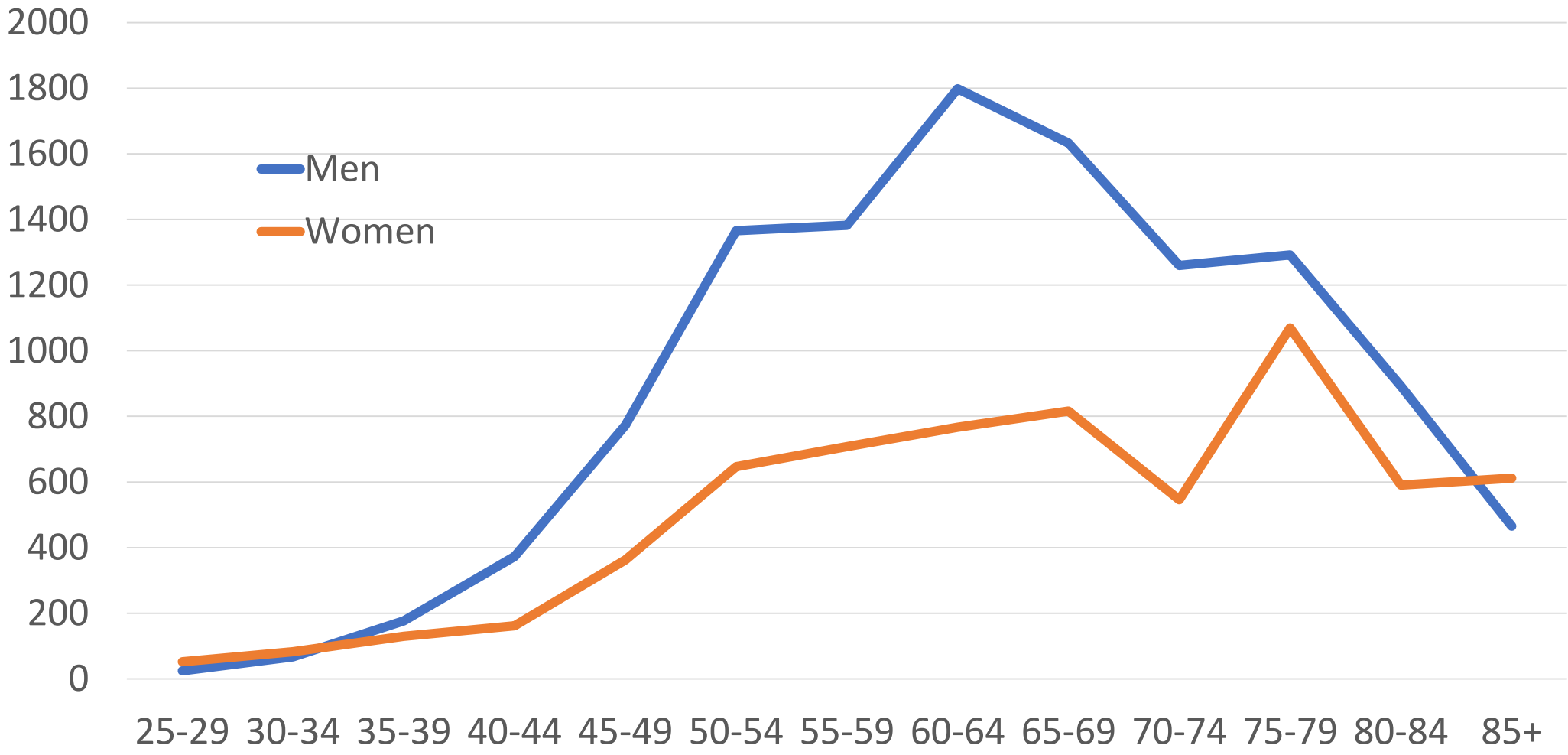
DALY DT2 attributable to risk alcohol consumption



DALY DT2 attributable to high BMI



DALY DT2 attributable to low fruit intake



PAFs (both sexes)

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	smoking	risk alcohol consumption	BMI	low fruit comsumption	Combined
15-19 y	0,094	0,000	0,339	0,062	0,438
20-24 y	0,125	0,001	0,436	0,060	0,537
25-29 y	0,150	0,004	0,545	0,064	0,639
30-34 y	0,148	0,003	0,598	0,054	0,677
35-39 y	0,144	0,001	0,613	0,054	0,687
40-44 y	0,152	0,002	0,597	0,048	0,675
45-49 y	0,157	0,002	0,580	0,037	0,660
50-54 y	0,141	0,004	0,578	0,033	0,651
55-59 y	0,136	0,003	0,568	0,026	0,637
60-64 y	0,094	0,002	0,542	0,019	0,593
65-69 y	0,072	0,004	0,489	0,017	0,536
70-74 y	0,047	0,004	0,456	0,013	0,490
75-79 y	0,031	0,002	0,406	0,011	0,431
Total	**0,118**	**0,003**	**0,511**	**0,046**	**0,589**

Discussion

- Overall, about 60 % of the burden of diabetes (YLL, YLD, DALY) is attributable to modifiable risk factors
- The highest share of the burden is attributable to high BMI
- There are significant differences according to age, generally increasing with age
- Higher number of DALY attributable to risk factors are obeserved in men, compared to women

Conclusion

- Political interventions aiming at change in life style of people could contribute to less DALY due to DT2
- Interventions should be tailored according to age and sex

Outlook

- Inclusion of further risk factors
- Extension of estimation towards other diseases (lung cancer and COPD)
- Estimations on regional level
- Further investigation according to social determinants

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DANKE
MERCI Хвала
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