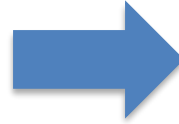




**Burden of disease
assessment for COVID-19.
The case of Germany**

Dr. Elena von der Lippe
Team BURDEN 2020



How can BoD contribute to the surveillance of the current COVID 19 pandemic?



How to make use of the ongoing data collection on notifiable diseases for BoD calculations?

- YLL
- YLD
- DALY

National BoD Study for Germany

- Comprehensible methodology
- Best available data
- Sub-national estimates
- Capacity building



YLL

Years of life lost

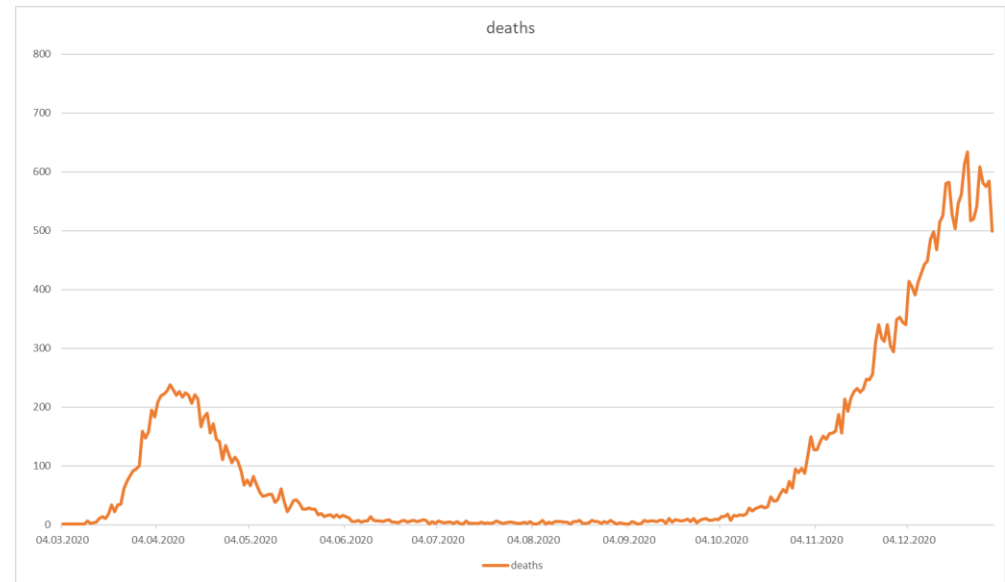
Methods

- HIS on notifiable diseases (data up to 31/12/20)
- Reported deaths: „died from“ vs. „died with“
- German life tables; max. LE on federal state level

Data (01.01.2020 – 31.12.2020)

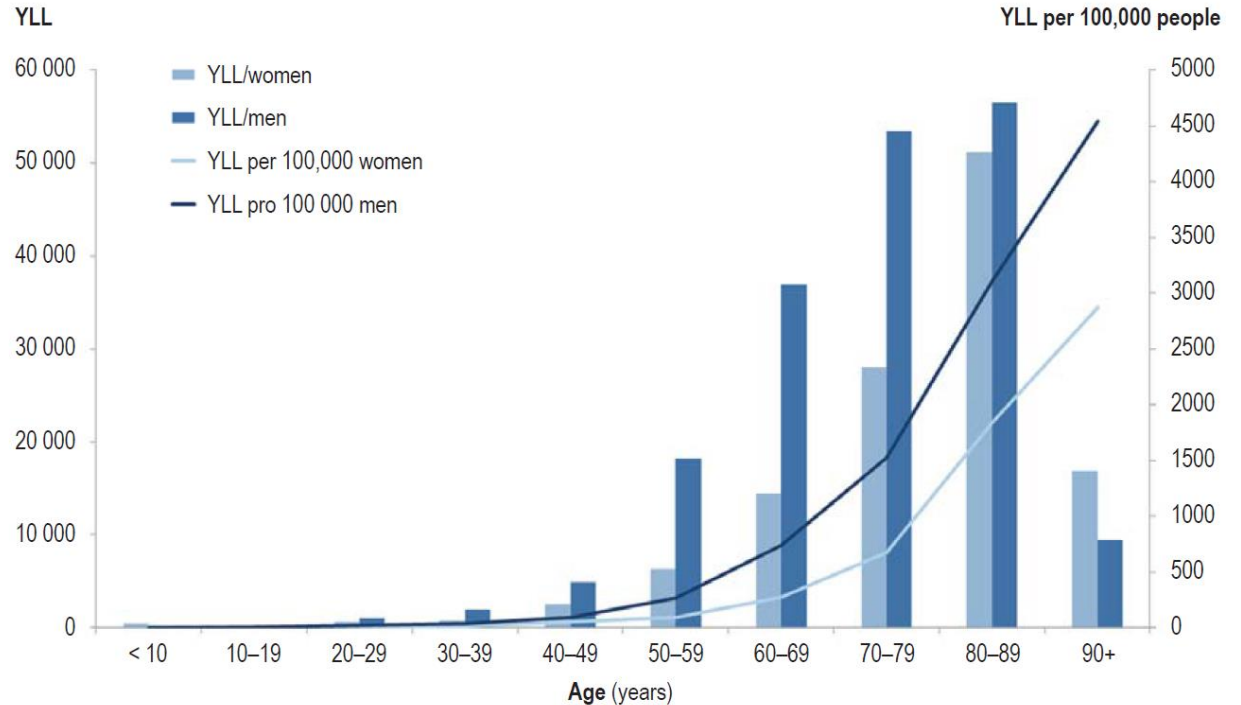
- 31,638 deaths with SARS-CoV-2 infection
- 81.9 % of deaths reported as cases „died from“
- 89.0 % of all deceased aged 70+

$$YLL = \sum_{i=0}^n d_{i,g} * l_i$$



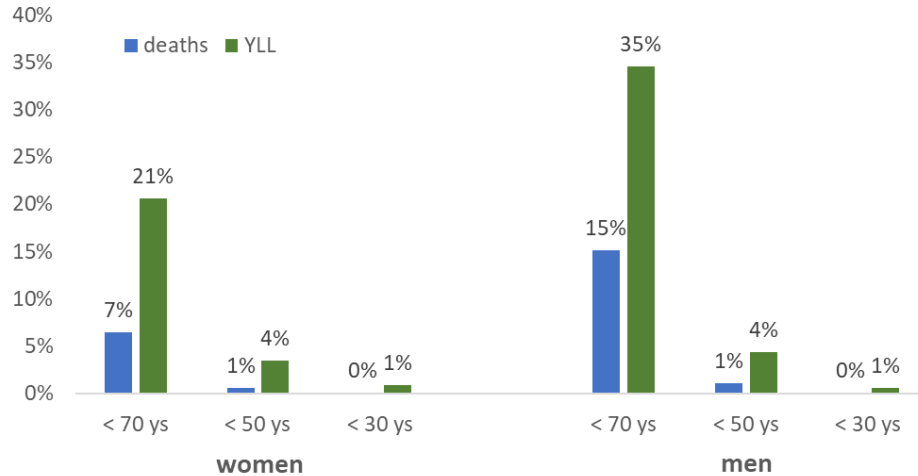
YLL by age and sex

	YLL
Women	121,114
Men	182,494
Total	303,608



Source: Robert Koch Institute; state of data January 18th 2021

YLL by age and sex



Share of deaths and YLL

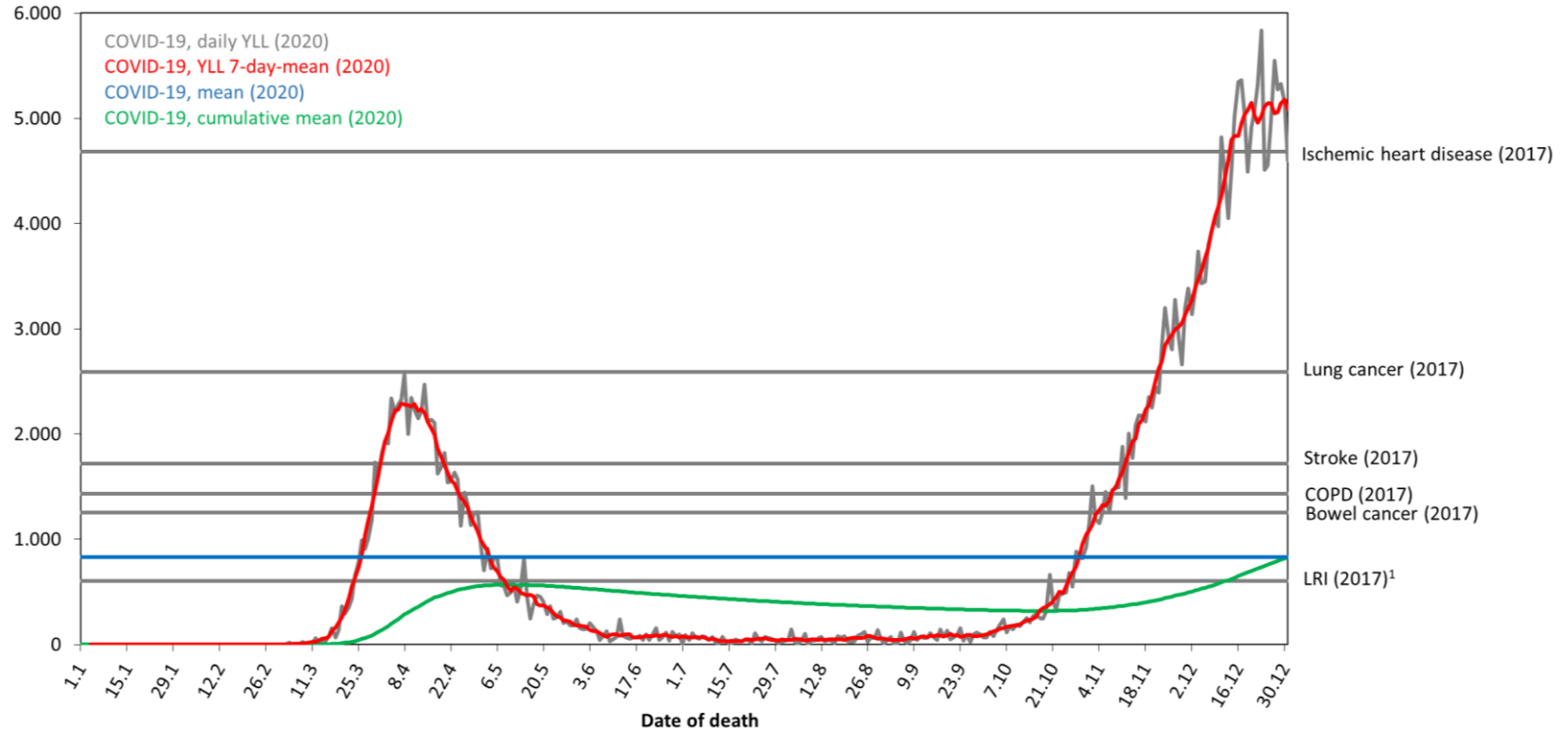
Average YLL per death

	women	men	total
all ages	8,1	11,0	9,6
< 70 ys	20,6	34,6	29,0

Source: Robert Koch Institute; state of data January 18th 2021



Years of life lost



Source: Robert Koch Institute; state of data January 18th 2021



YLD

Years lived with disability



Methods

Methods

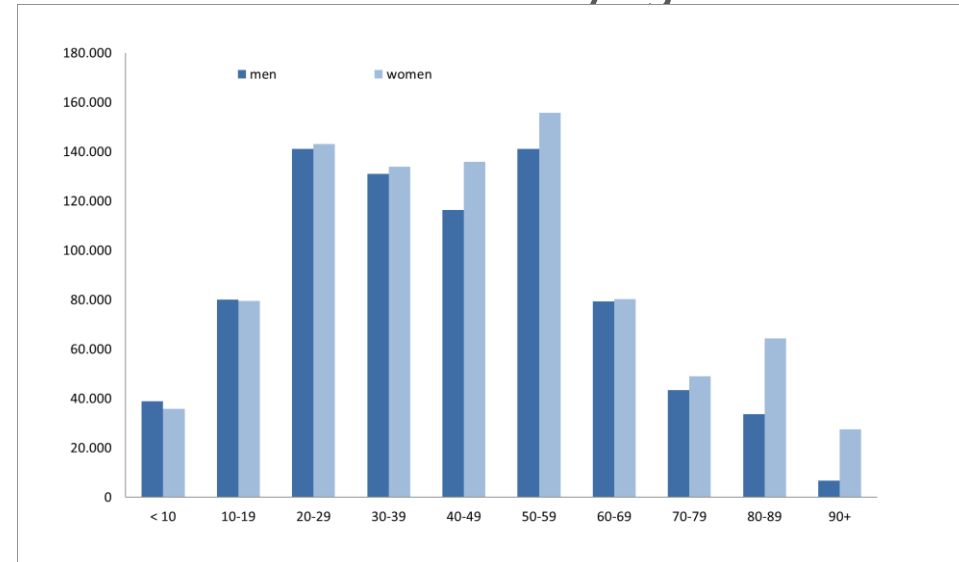
- HIS on notifiable diseases (data up to 31/12/20)
- Severity: reported symptoms, hospitalisation
- Existing disability weights; estimated durations

Data

- 1.717.006 non-fatal SARS-CoV-2 infections
- About one third of cases w/o information on symptoms

$$YLD = \sum_{i=1}^{10} \sum_{g=1}^2 \sum_{j=1}^5 \delta_j * I_{i,g,j} * DW_j$$

Non-fatal infections by age and sex



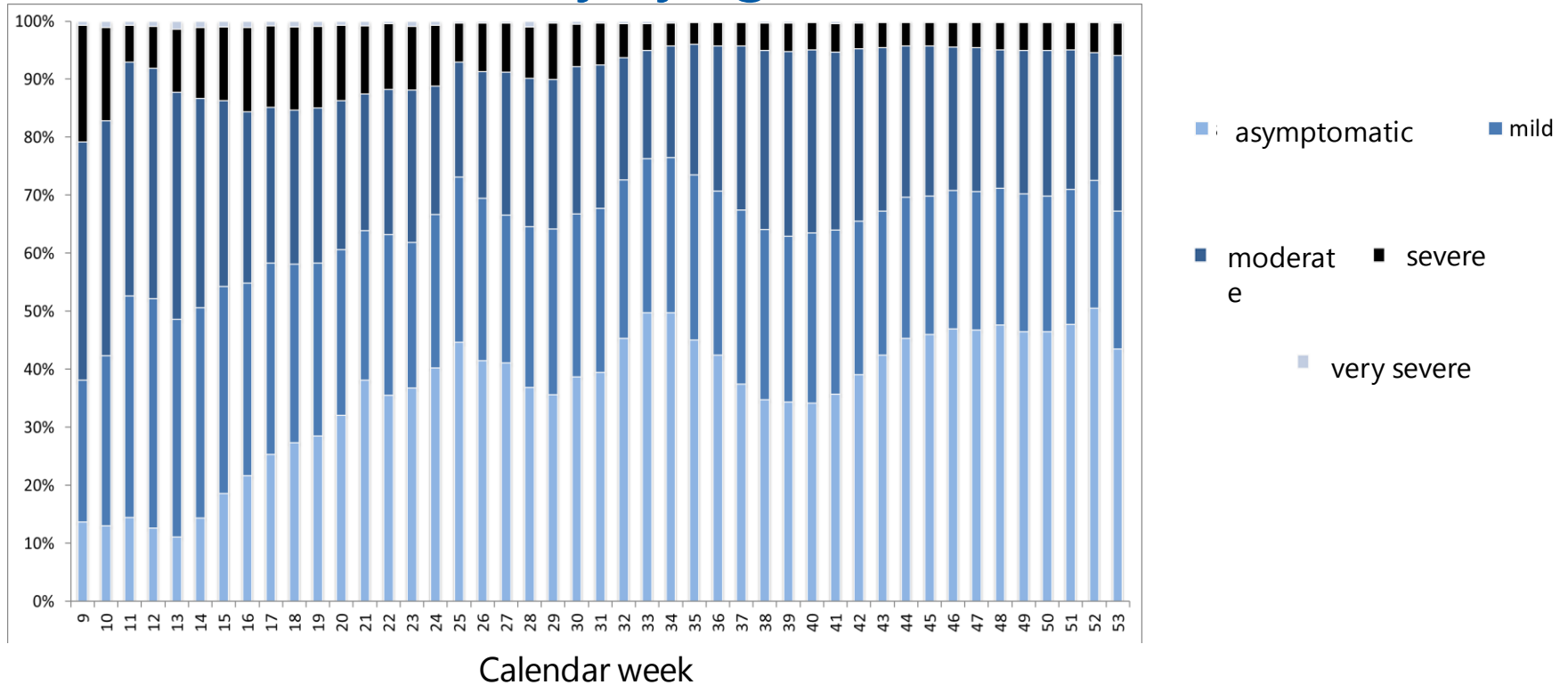


Severity and disability weights

SEVERITY	CASE DEFINITIONS		DISABILITY WEIGHT
	GBD (lay descriptions)	BURDEN 2020	
Asymptomatic		Infection but no symptoms	0,000
Mild	Upper respiratory tract infection: ... has a low fever and mild discomfort, but no difficulty with daily activities	General signs of illness or clinical symptoms, sore throat, rhinitis, impaired sense of smell or taste or clinical symptoms present	0,006 GBD
Moderate	Upper respiratory tract infection/lower respiratory tract infection: ... has a fever and aches, and feels weak, which causes some difficulty with daily activities.	... and additionally: fever, cough, pneumonia or diarrhoea	0,051 GBD
Severe	Lower respiratory tract infection: ... has a high fever and pain and feels very weak, which causes great difficulty with daily activities	... and additionally: hospitalization (without intensive care)	0,133 GBD
Most severe/ critical		... and additionally: admission to an intensive care unit	0,655 European disability weights study

Severity	Parameters		
	Distribution	Duration	Disability weight
Asymptomatic	42 %	14 days	0,000
Mild	25 %		0,006
Moderate	27 %		0,051
Severe	5 %	21 days	0,133
Most severe/critical	< 1 %	32 days	0,655
	100 %		

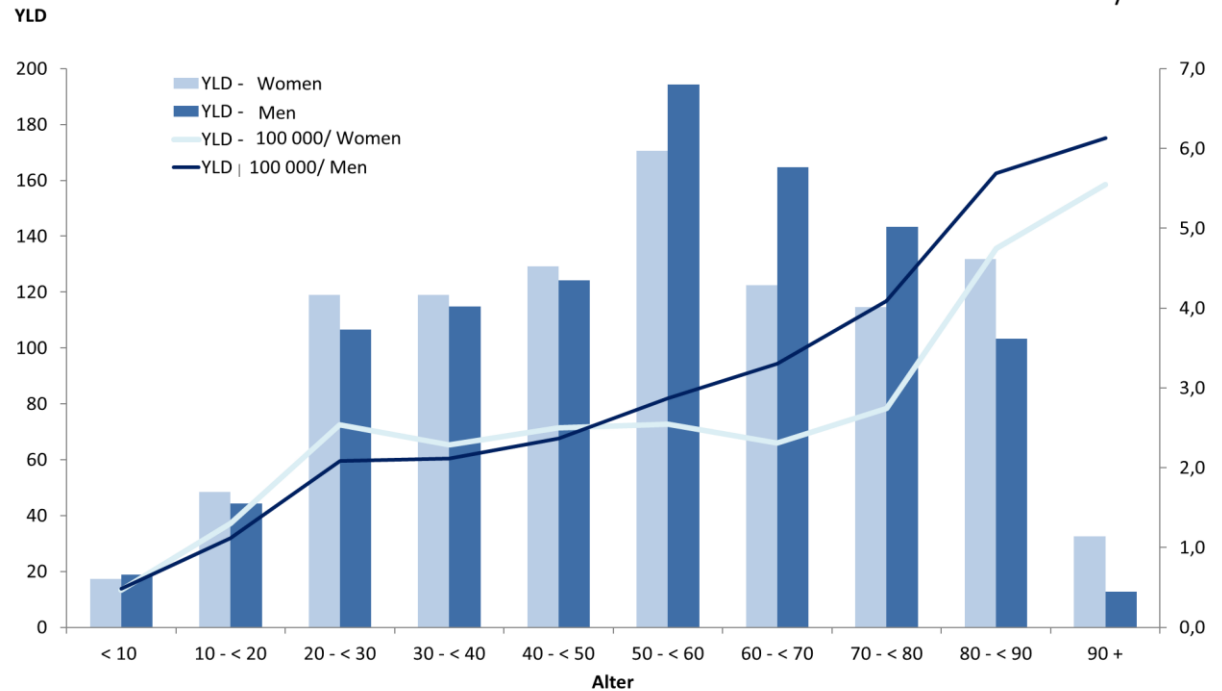
Severity by age and week (in %)



Source: Robert Koch Institute; state of data January 18th 2021

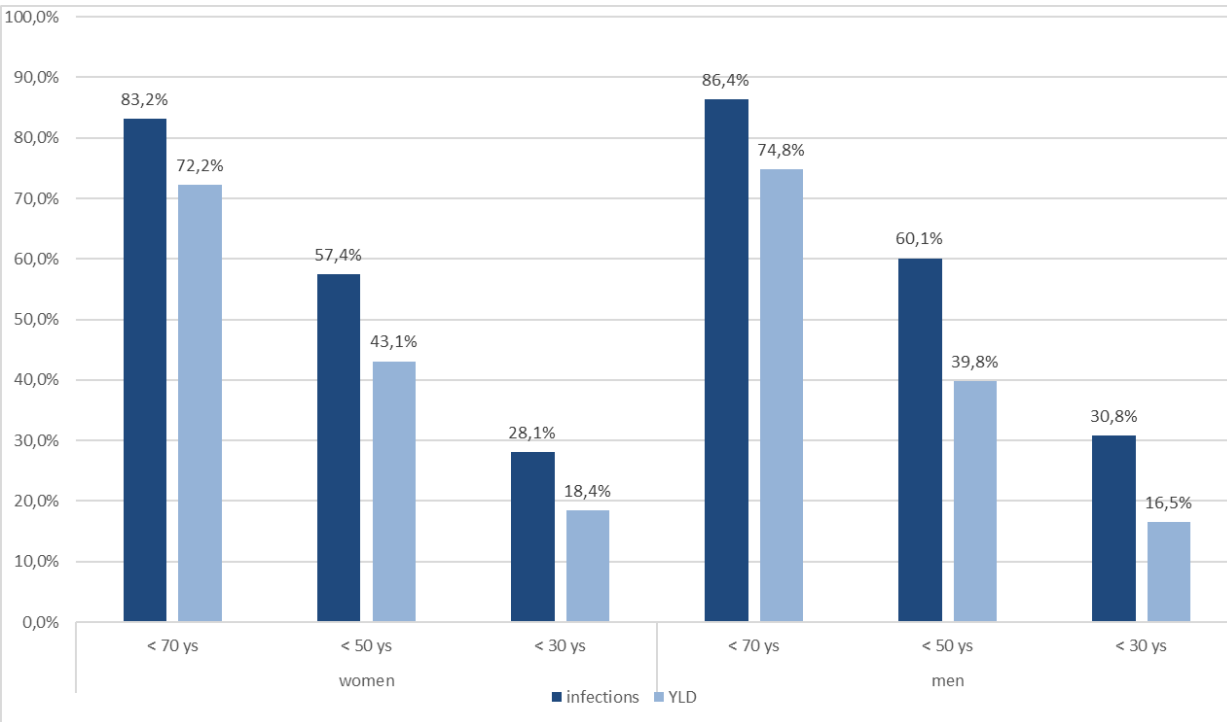
YLD by age and sex

	YLD
Women	1005
Men	1028
Total	2,033



Source: Robert Koch Institute; state of data January 18th 2021

YLD by age and sex



Share of infections and YLD

Source: Robert Koch Institute; state of data January 18th 2021



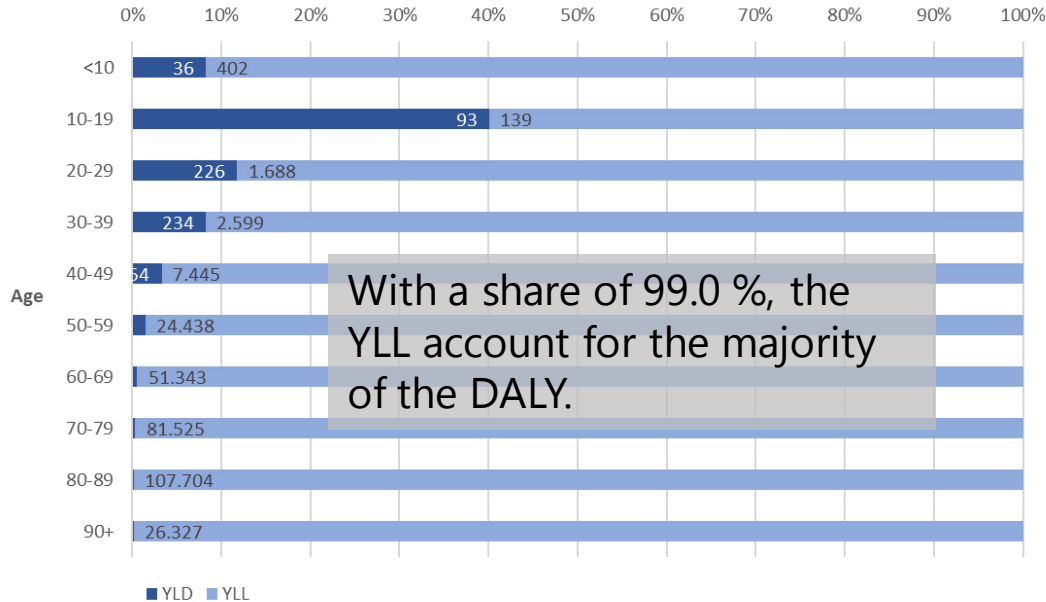
DALY

Disability adjusted life years



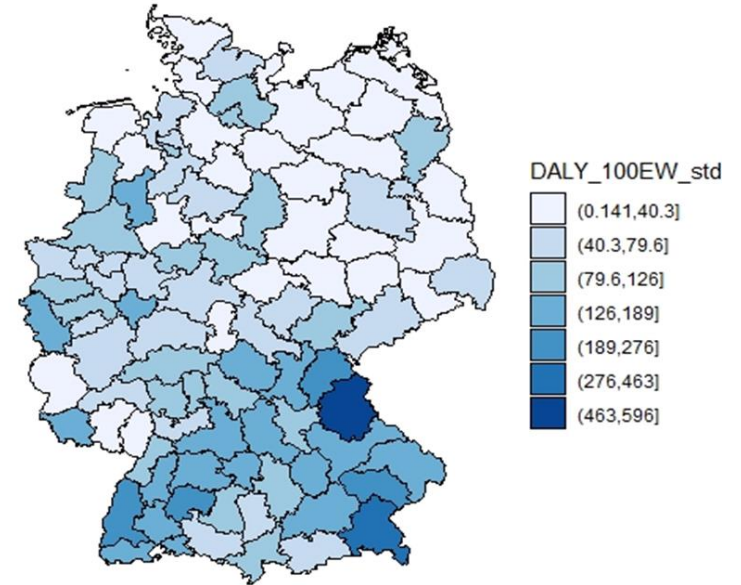
DALY

Share YLD / YLL by age



With a share of 99.0 %, the YLL account for the majority of the DALY.

DALY / 100,000 by region



Source: Robert Koch Institute; state of data January 18th 2021

Strengths: BoD as a useful tool

- for a timely monitoring of pandemics
- to shift the focus from cases to severe impact
- to make the pandemic comparable to other diseases

Limitations

- completeness of data (missing values)
- validity/reliability of information
- no consideration of Long COVID / long-term sequelae

In English:

<https://www.aerzteblatt.de/int/archive/article/218061>

In German:

<https://www.aerzteblatt.de/int/archive/article/218064>

Future Projects:

BoCO-19: Towards a harmonization of population health metrics for the surveillance of dynamic outbreaks

<https://www.burden-eu.net/news/spotlight/323-boco-19>



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