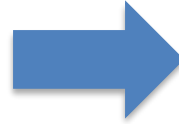


The background of the slide is a blue-tinted aerial photograph of a large crowd of people walking in various directions. A vertical white line is positioned to the left of the title box.

COVID-19 disease burden in Germany

Dr. Alexander Rommel

 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



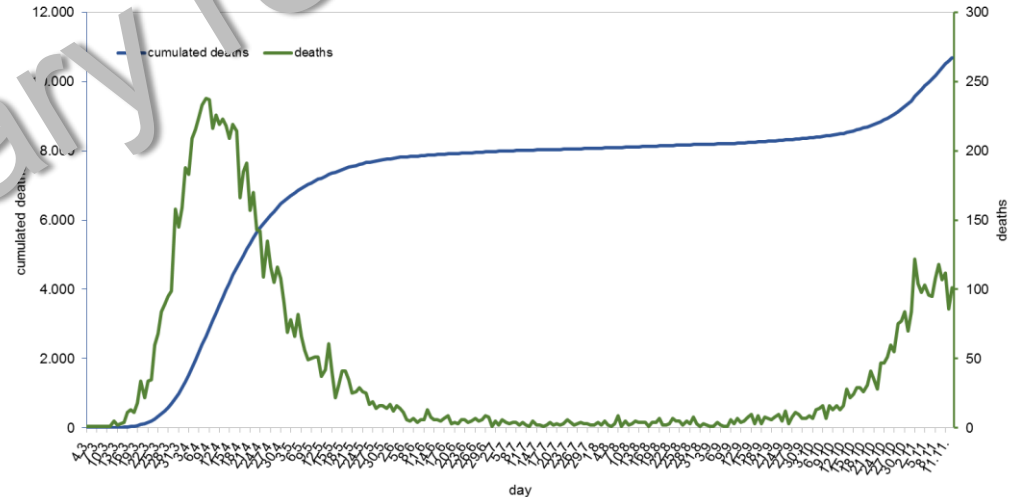
Methods

- HIS on notifiable diseases (data up to 17/11/20)
- Reported deaths: „died from“ vs. „died with“
- German life tables; max. LE on federal state level

Data

- 12,814 deaths with SARS-CoV-2 infection
- 84.6 % of deaths reported as cases „died from“
- 86.3 % of all deceased aged 70

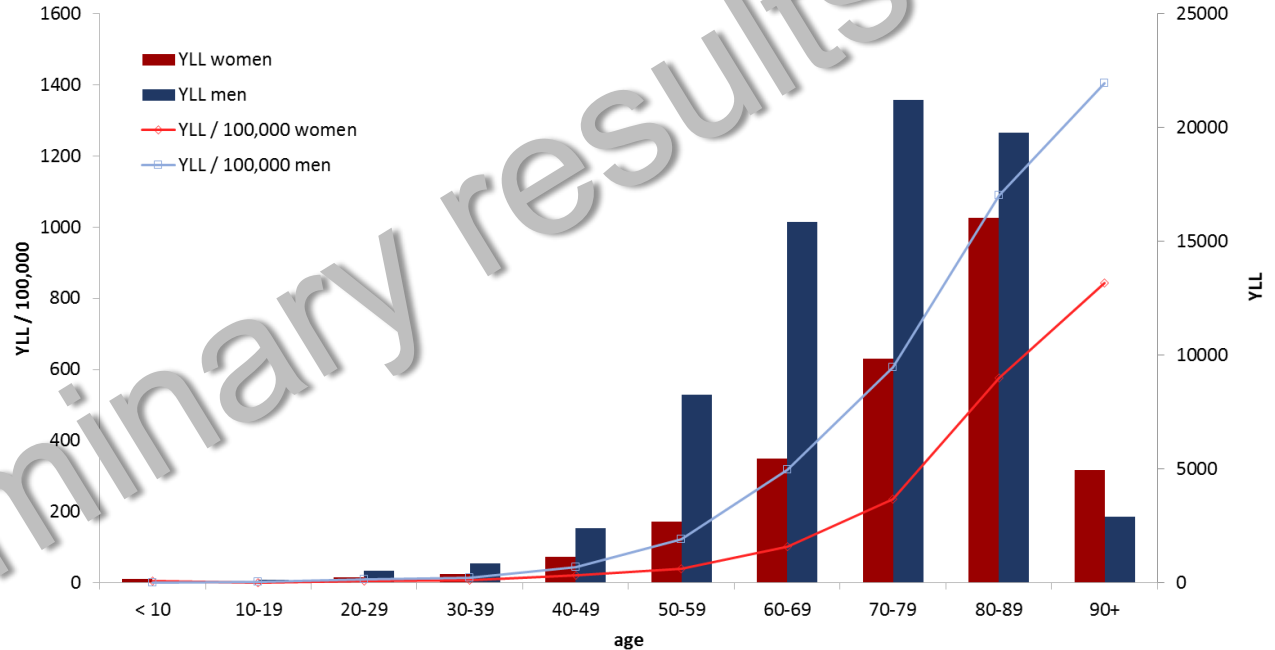
$$YLL = \sum_{t=0}^{\infty} d_{t,g} * l_i$$





YLL by age and sex

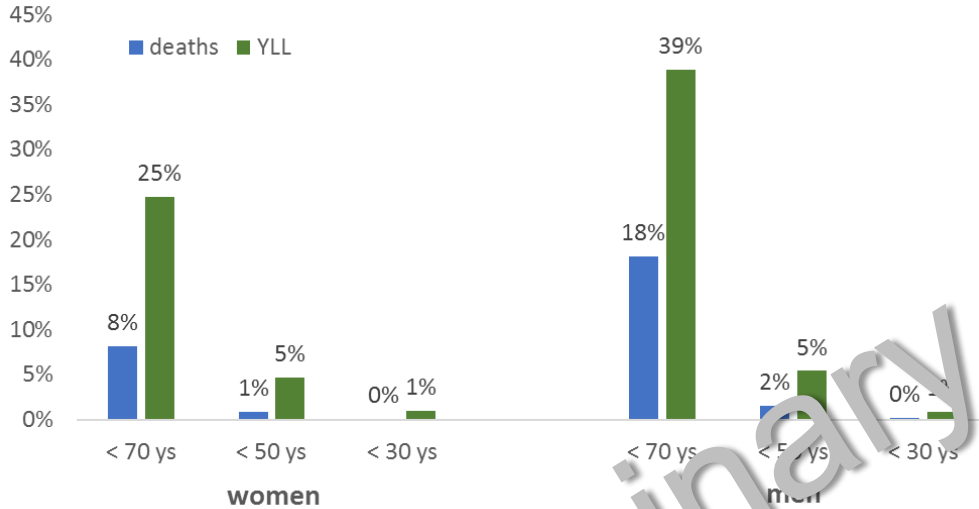
	YLL
Women	40,888
Men	71,876
Total	112,764



Source: Robert Koch Institute; state of data November 17th 2020



YLL by age and sex



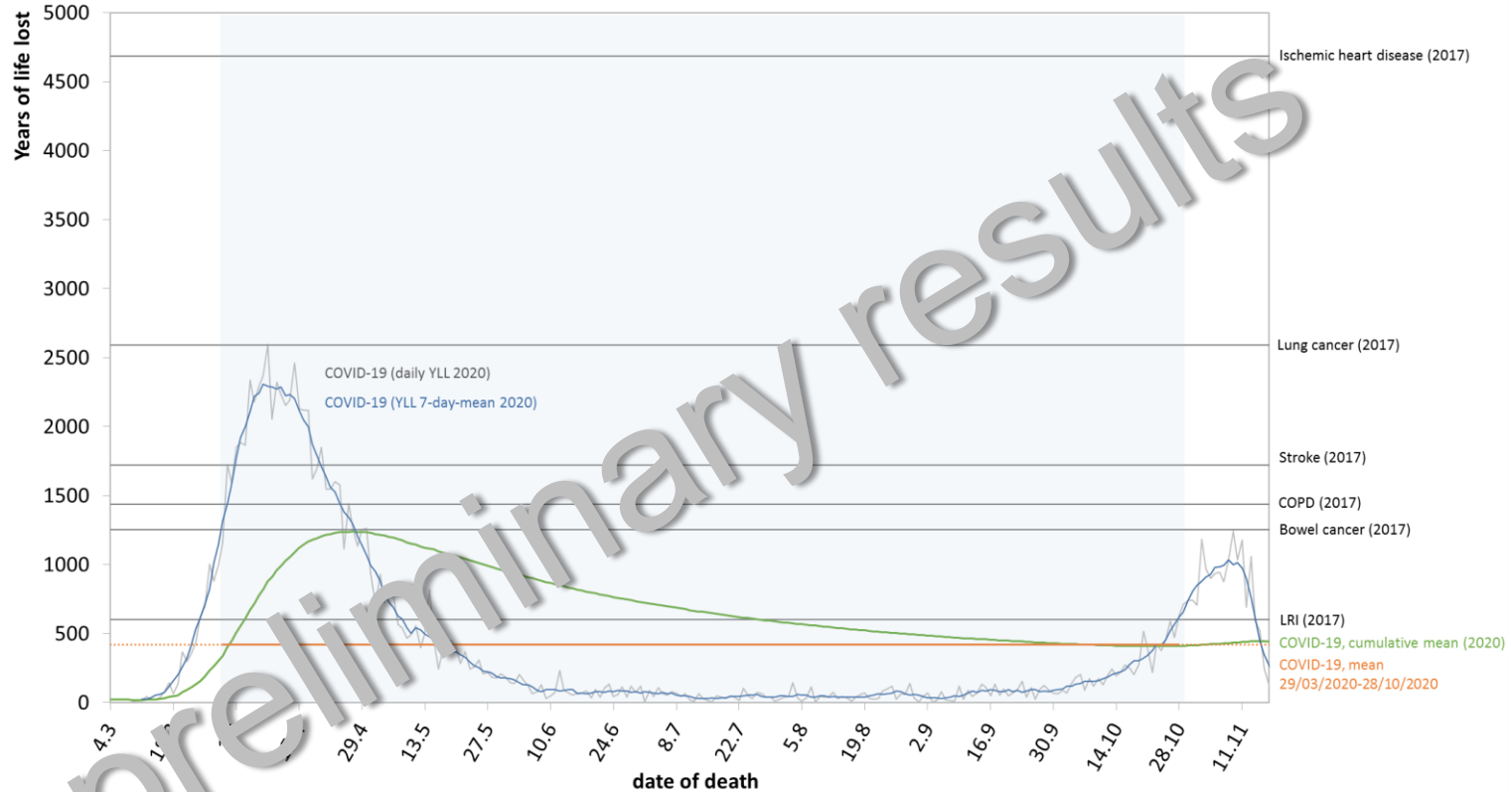
Share of deaths and YLL

Average YLL per death

	women	men	total
all ages	8,6	11,8	10,4
< 70 ys	26,3	25,4	25,6

Source: Robert Koch Institute, state of data November 17th 2020

YLL on a daily basis



Source: Robert Koch Institute; state of data November 17th 2020

YLD

Years lived with disability



Methods

Methods

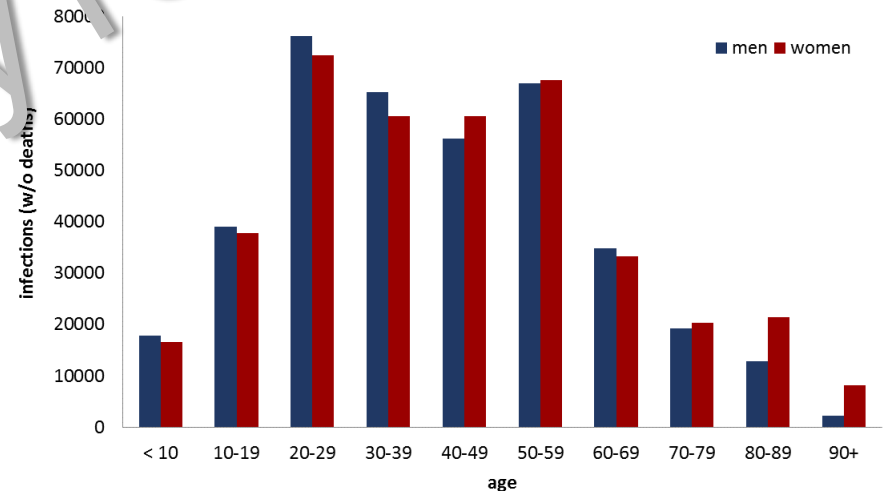
- HIS on notifiable diseases (data up to 17/11/20)
- Severity: reported symptoms, hospitalisation
- Existing disability weights; estimated durations

Data

- 802.880 non-fatal SARS-CoV-2 infections
- About one third of cases with information on symptoms

$$YLD = \sum_{i=1}^{10} \sum_{g=1}^2 \sum_{j=1}^3 \delta_j * I_{i,g,j} * DW_j$$

Non-fatal infections by age and sex





Severity and disability weights

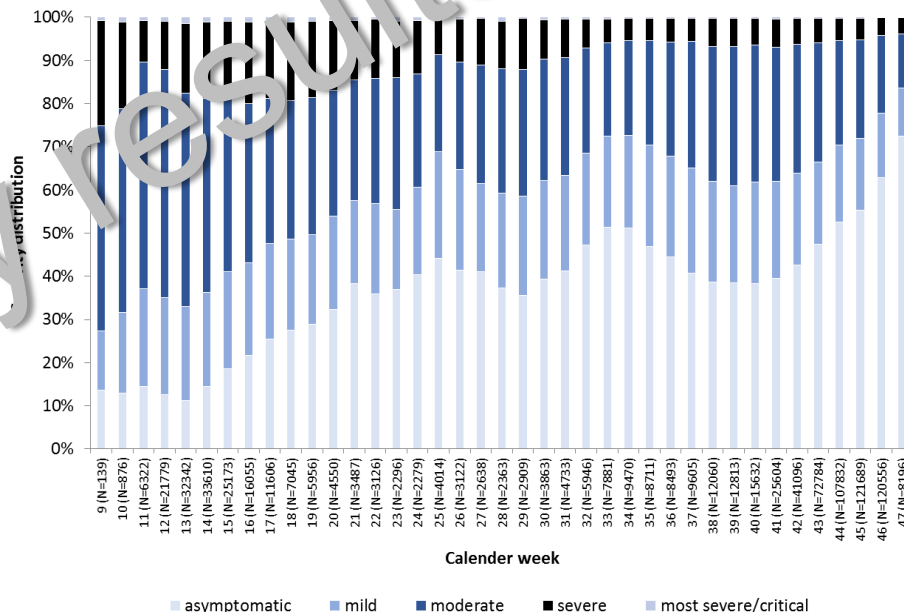
SEVERITY	CASE DEFINITIONS		DISABILITY WEIGHT
	GBD (lay descriptions)	BURDEN 2020	
Asymptomatic		Infection but no symptoms	0,000
Mild	Upper respiratory tract infection: ...has a low fever and mild discomfort, but no difficulty with daily activities	General signs of illness and clinical symptoms, sore throat, rhinitis, impaired sense of smell or taste or clinical symptoms present	0,006 GBD
Moderate	Upper respiratory tract infection/low 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



Parameters

Severity	Parameters		
	Distribution	Duration	Disability weight
Asymptomatic	44 %	14 days	0,000
Mild	19 %		0,006
Moderate	28 %		0,051
Severe	8 %		0,133
Most severe/critical	< 1 %		0,655
	100 %		

Severity by age and week (in %)

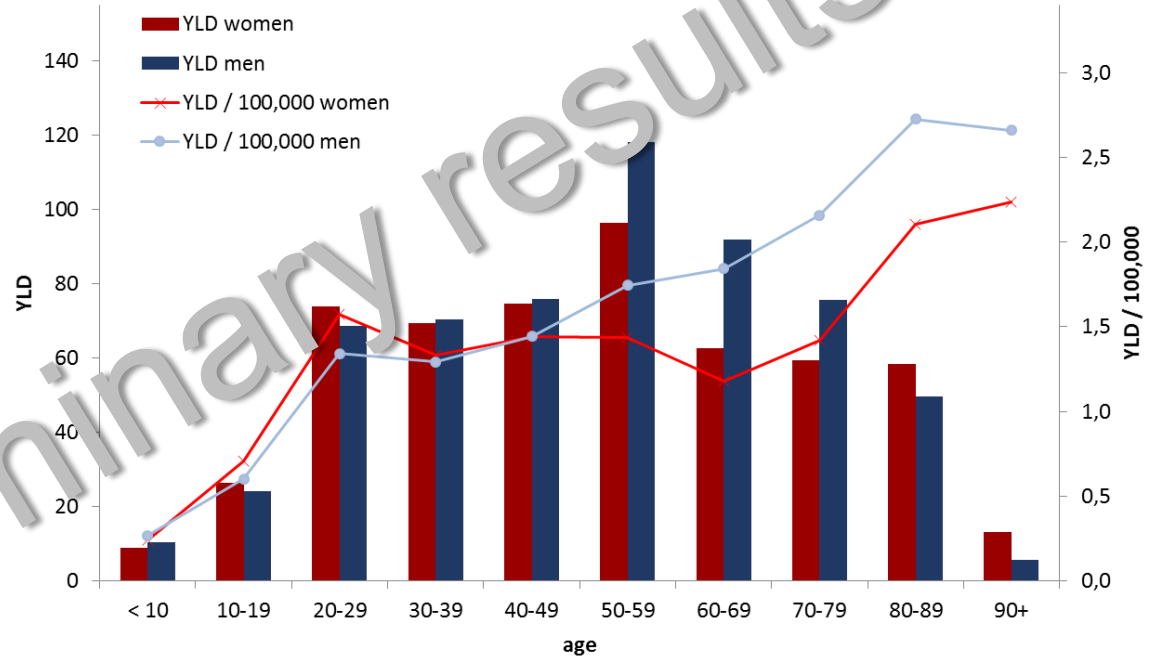


Source: Robert Koch Institute; state of data November 17th 2020



YLD by age and sex

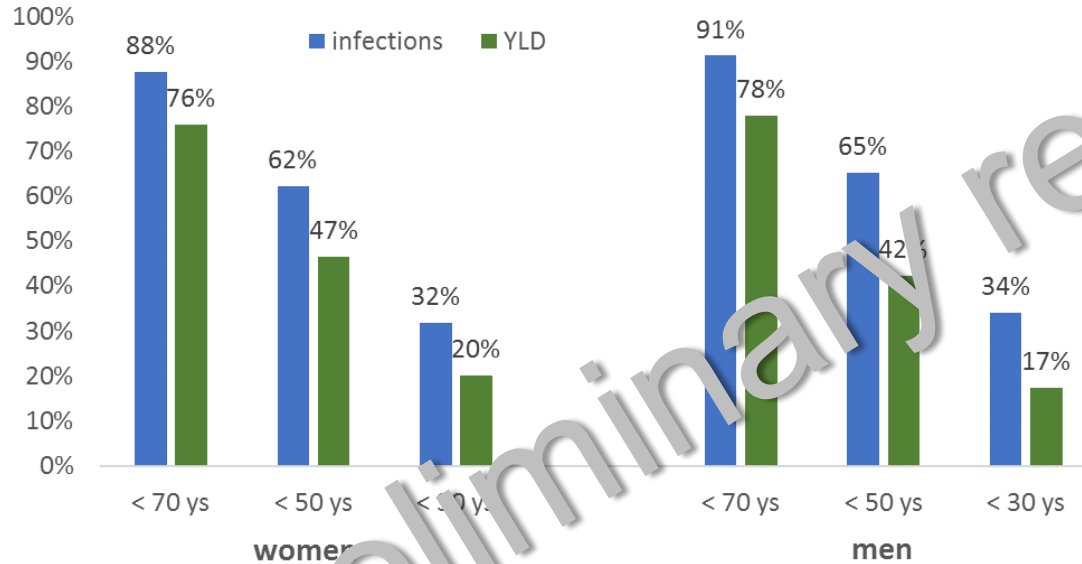
	YLD
Women	543
Men	590
Total	1,133



Source: Robert Koch Institute; state of data November 17th 2020



YLD by age and sex



Share of infections and YLD

Source: Robert Koch Institute; state of data November 17th 2020



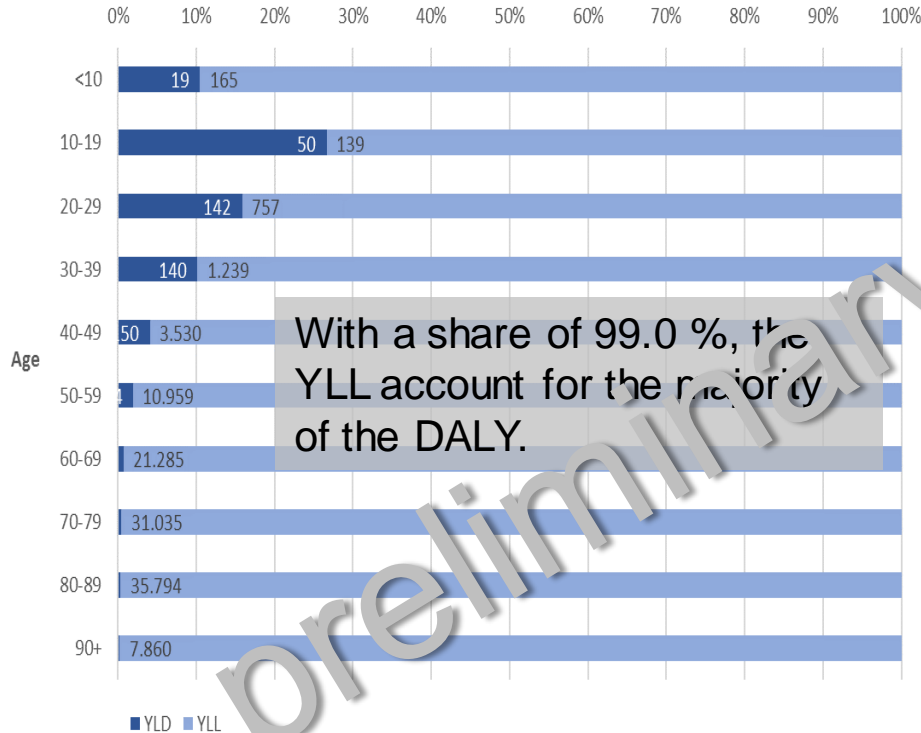
DALY

Disability adjusted life years



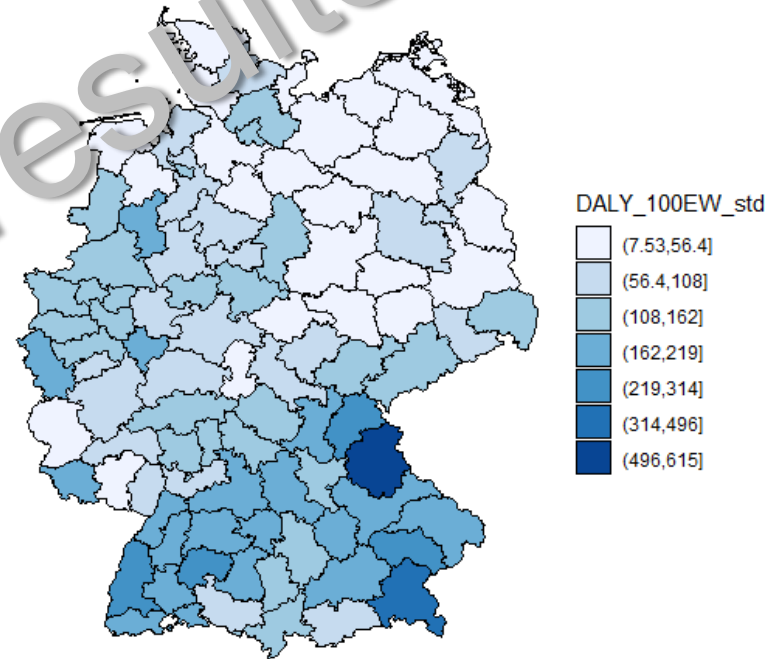
DALY

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 November 17th 2020



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



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