

BURDEN OF DISEASE OF COVID-19 IN EUROPEAN COUNTRIES

Workshop: Burden of disease of COVID-19: strengthening the collaboration for national studies

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Background

Worldwide

- around 250 Million cases of COVID-19 (Europe 42 Million)
- 5 Million deaths (Europe 880,000)
- Burden of disease measures (YLL, YLD, DALY) appropriate for monitoring the pandemic
- In general harmonization of methods across countries desirable but
- Methodology depends on data characteristics and orientation of national BoD studies

Country and analysis period	Estimation of total symptomatic infected	Life expectancy table	Mortality due to COVID	Include post-acute	DALY/100,000	% YLD
Netherlands [2020]	Yes ^a (evidence synthesis)	GBD-2019	Statistics Netherlands registered (confirmed+suspected)	No (in progress)	1570 (1540-1600)	1%
Scotland [2020]	Yes (SEIR modelling)	GBD-2019	Death registry (confirmed only or confirmed+suspected)	Yes, limited	1770-1980	2%
Germany [2020]	No (notified positives only)	Germany 2016/2018	Death registry	No	368	0.7%
Malta [7 Mar 2020 - 31 Mar 2021]	Yes (notified positives adjusted for underascert.)	GBD-2019	Daily COVID-19 bulletins issued by MaltaMinistry of Health	Yes, limited	1086 ^b	5%

GBD-2019 life expectancy

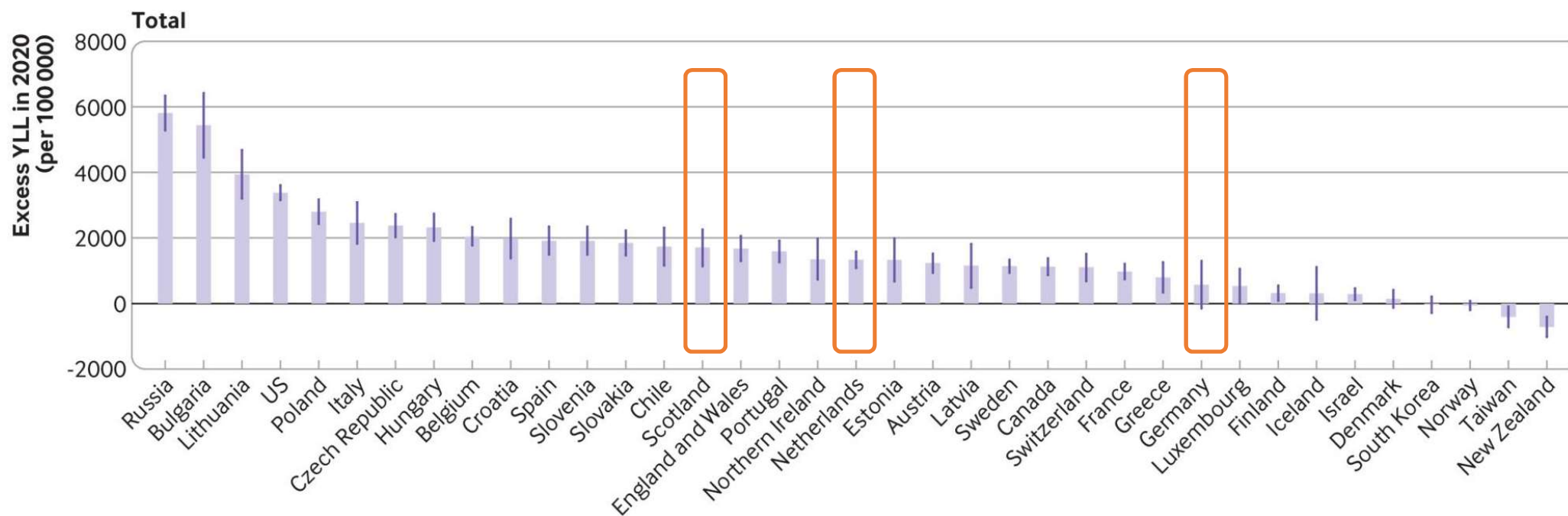
542 DALY/100,000

Note. ^a For the Netherlands, 'total symptomatic infected' is derived using the ECDC case definition (see Methods).

^b Calculated based on the reported estimate of 5478 DALY, in population size of 505,200 (estimate for 2019; World Bank)

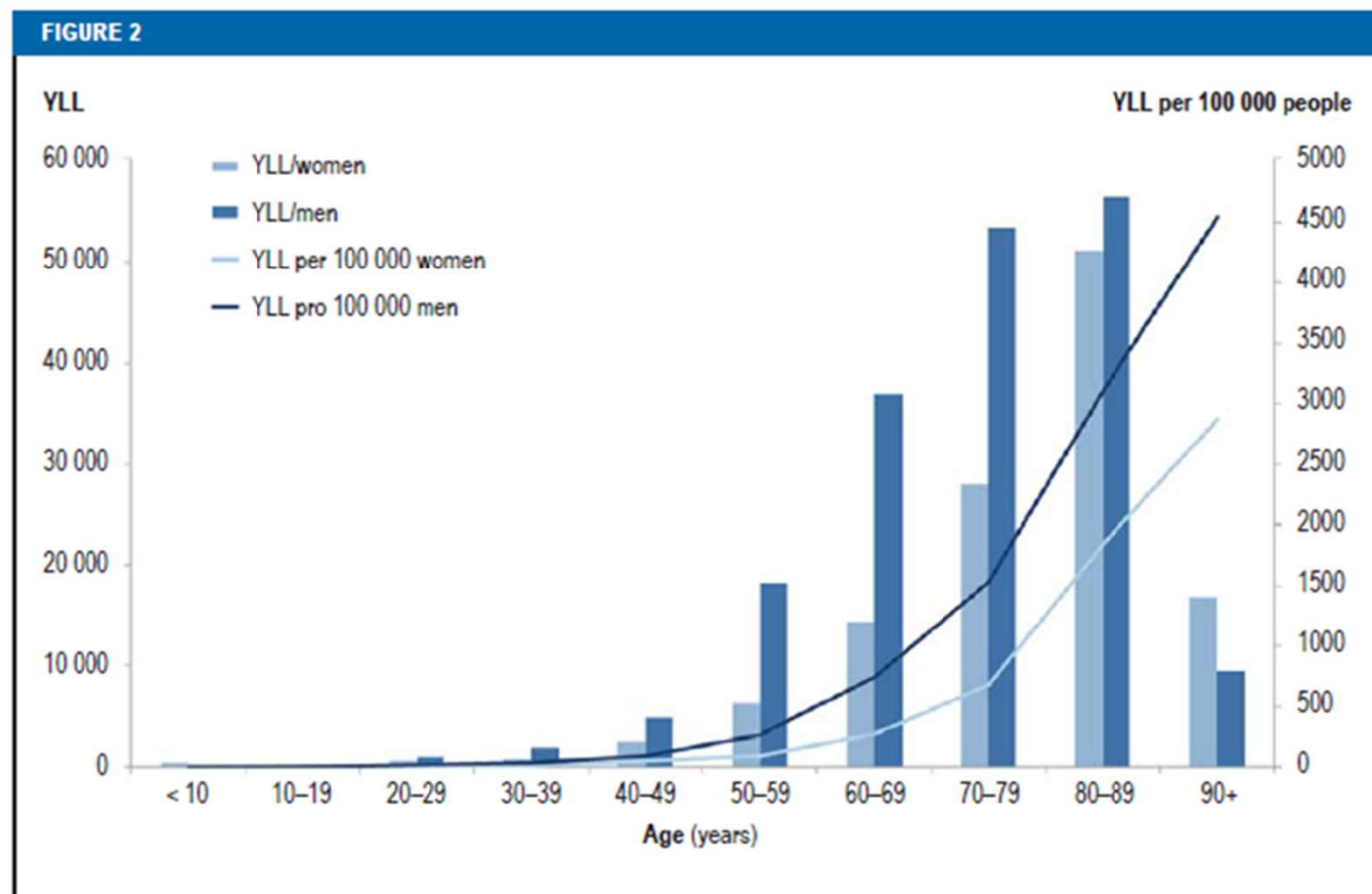
Source: McDonald SA, Lagerweij GR, de Boer P, et al. *The estimated disease burden of acute COVID-19 in the Netherlands in 2020*, in disability-adjusted life-years. Research Square. November 01, 2021. doi: 10.21203/rs.3.rs-1026794/v1

Excess YLL in 2020



Source: Islam N, Jdanov D A, Shkolnikov V M, Khunti K, Kawachi I, White M et al. *Effects of covid-19 pandemic on life expectancy and premature mortality in 2020: time series analysis in 37 countries* BMJ 2021; 375 :e066768 doi:10.1136/bmj-2021-066768

Results – YLL in Germany



Years of life lost (YLL) among persons with COVID-19 in Germany in 2020 by age and sex (absolute figures and per 100 000 people)

Source: Rommel et al. Dtsch
Arztebl Int. 2021 – *The
COVID-19 Disease Burden in
Germany in 2020*

DALY – Netherlands

Fig. 2 Estimated DALY (split into YLD and YLL) per 5-year age-group with 95% CIs, 27 February through 31 December 2020. Inset zooms in on the age-groups <1 year to 30-34 years.

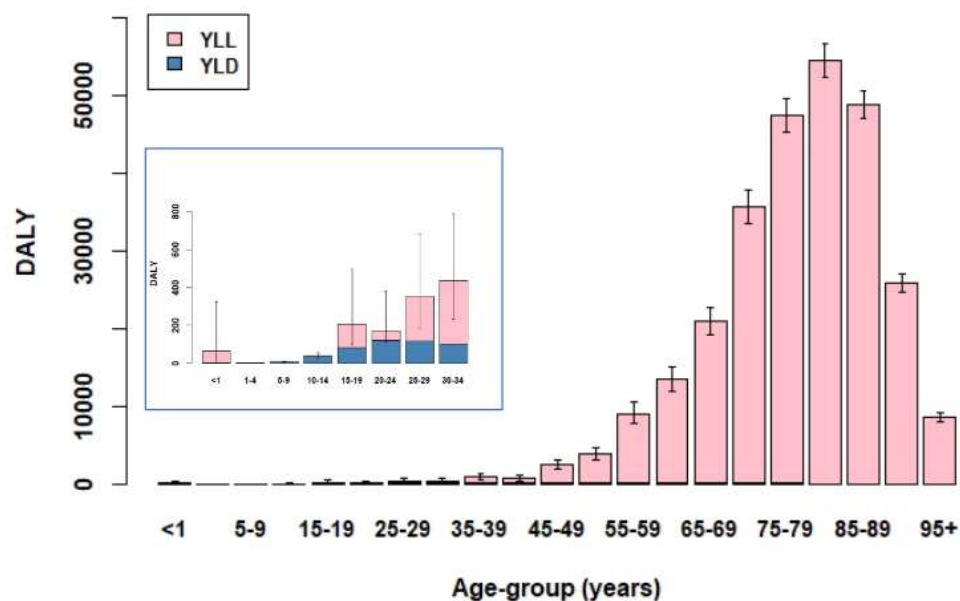
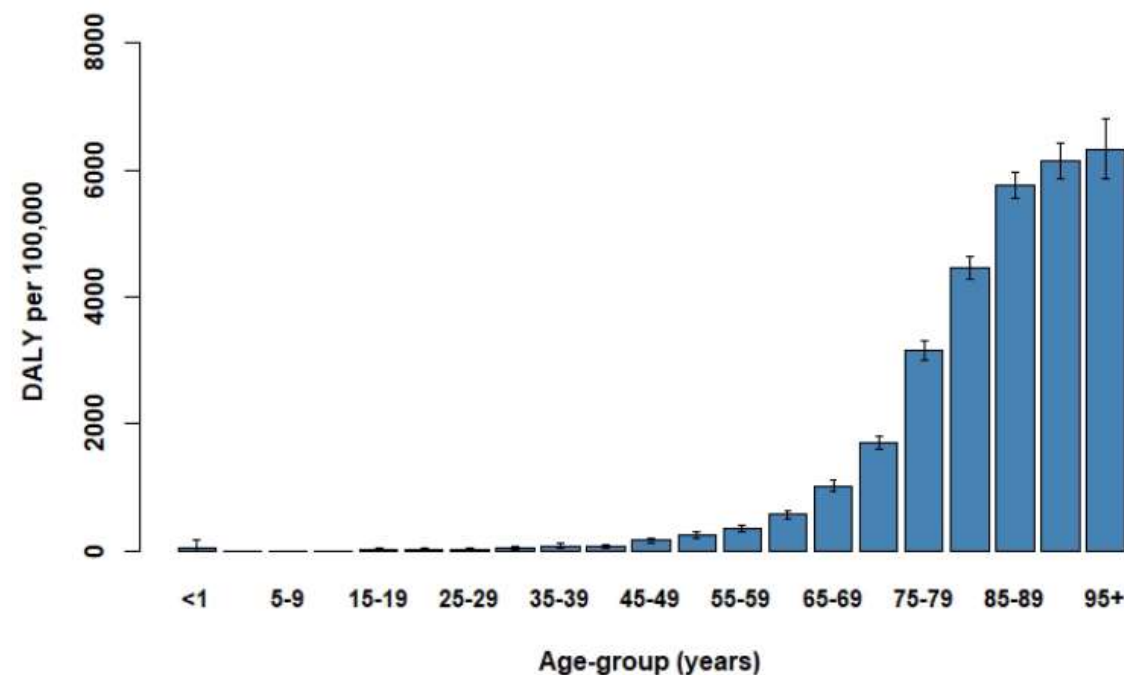


Fig. 3. Estimated disease burden per 5-year age-group as DALY per 100,000 population, 27 February through 31 December 2020.



Source: McDonald SA, Lagerweij GR, de Boer P, et al. *The estimated disease burden of acute COVID-19 in the Netherlands in 2020, in disability-adjusted life-years*. Research Square. November 01, 2021. doi: 10.21203/rs.3.rs-1026794/v1

Table 2 Measure of the population health impact of Covid-19

Health State	Morbidity			Mortality		DALYs (UI 95%)
	Persons	Person - years	YLD (UI 95%)	Deaths	YLL	
Covid-19 infection	70,421		250 (166-352)	331	5229	5478 (5395 - 5581)
Symptomatic Covid-19		1570	93 (60-131)			
Moderate		1507	77 (48-112)			
Severe		49	7 (4-9)			
Critical		14	9 (8-10)			
Post-acute consequences ^a	9366	718	157 (106-221)			

^aduration of 28 days

0.0013 YLD per infection in Malta
 0.0012 YLD per infection in Germany →

15.8 YLL per death in Malta
 10.4 YLL per death in Germany

TABLE			
Reported cases (infections, deaths) and disease burden by age group			
		women	men
		All ages	All ages
Mortality			
Deaths	absolute	14 984	16 654
	%	100%	100%
YLL	absolute	121 114	182 494
	%	100%	100%
Morbidity			
Infections	absolute	905 293	811 713
	%	100%	100%
YLD	absolute	1005	1028
	%	100%	100%
Mortality and morbidity			
All infections	absolute	920 277	828 367
	%	100%	100%
DALY	absolute	122 119	183 522
	%	100%	100%

DALY by area deprivation – Scotland

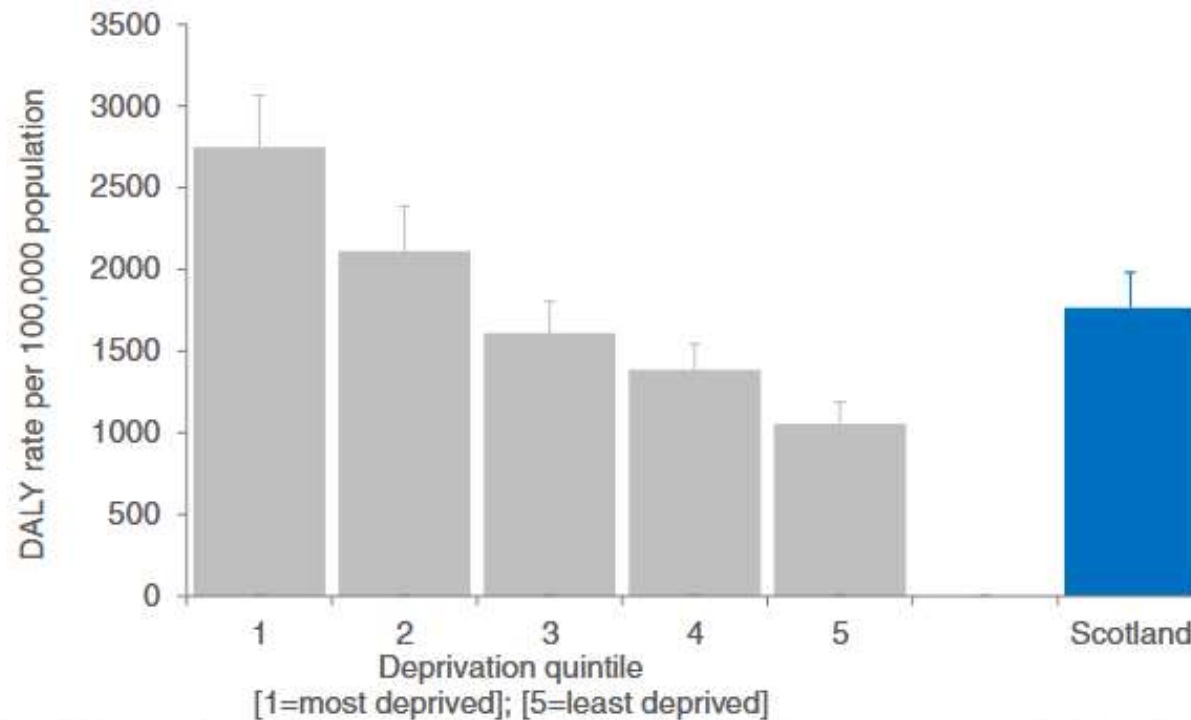


Fig. 1 Disability-adjusted life years directly due to COVID-19, by area deprivation, Scotland, 2020. DALYs denote 'disability-adjusted life years'; bars represent the lower rate limit for COVID-19 DALYs; extended error bars represent the range between the lower and upper rate limit; overall Scottish rate is given in blue

Source: Wyper GMA, Fletcher E, Grant I, Harding O, de Haro Moro MT, Stockton DL, McCartney G. *Inequalities in population health loss by multiple deprivation: COVID-19 and pre-pandemic all-cause disability-adjusted life years (DALYs) in Scotland*. *Int J Equity Health*. 2021;20:214. doi: 10.1186/s12939-021-01547-7

DALY by occupational status – Netherlands

Fig. 4. Estimated absolute disease burden (in DALY) per occupation category and 5-year age-group, 27 February through 31 December 2020. Inset zooms in on the age-groups 20-24 years through 40-44 years.

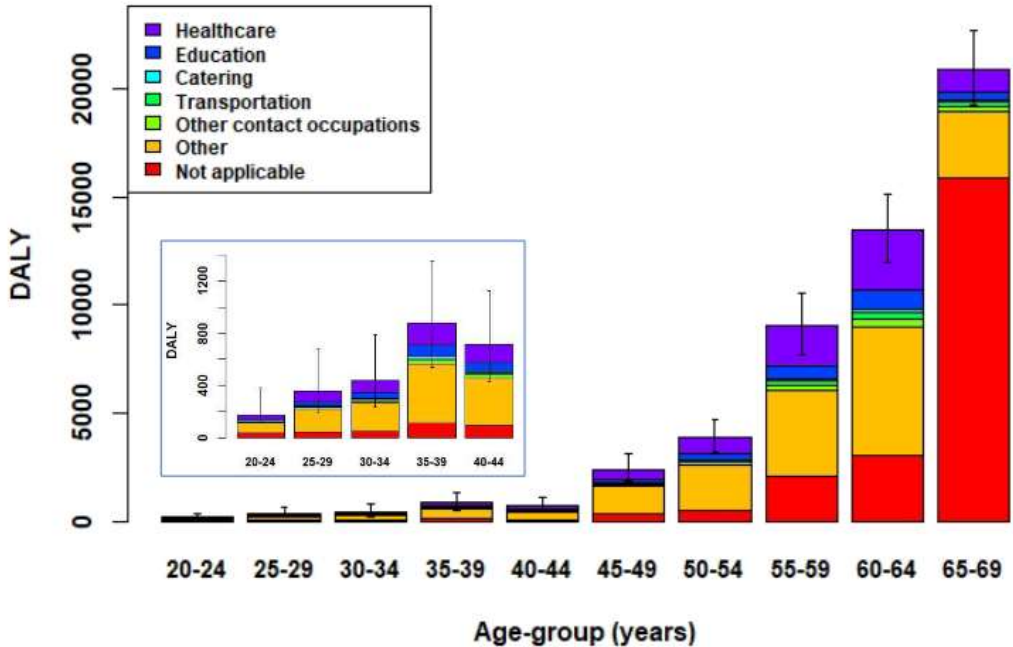
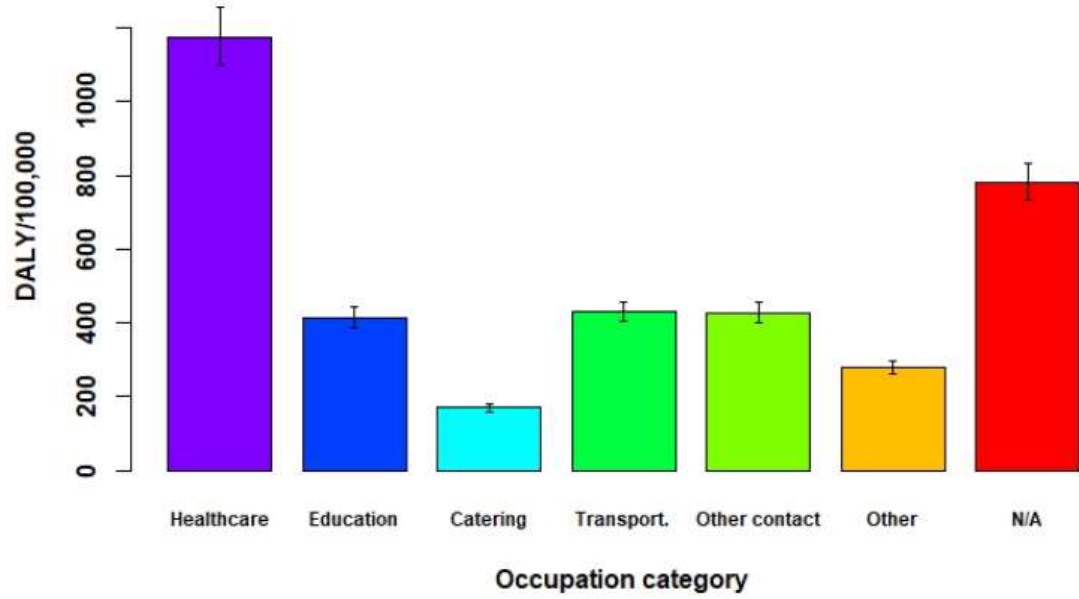


Fig. 5. Estimated disease burden per occupation category (as DALY per 100,000 persons in each category, aggregating over age and restricted to the age range 20-69 years only), 27 February through 31 December 2020.



Source: McDonald SA, Lagerweij GR, de Boer P, et al. *The estimated disease burden of acute COVID-19 in the Netherlands in 2020, in disability-adjusted life-years.* Research Square. November 01, 2021. doi: 10.21203/rs.3.rs-1026794/v1

Summary

- BoD indicators informative for evaluating the effect of COVID-19 on population health
- Some methodological and data differences between countries
- YLL contributed most to DALY
- COVID-19 continuously relevant disease / cause of death
 - long term effects need to be monitored



Thank you

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