

Being Sick Can Cost You Your Life

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How much of the age-associated risk of death due to COVID-19 can be explained by comorbid diseases, such as hypertension (HTN), diabetes (DM), cardiovascular disease (CVD), and chronic obstructive pulmonary disease (COPD)? All of it, it seems.

An individual with COPD has a 25% chance of dying from COVID-19 if/when they encounter it. However, on a population basis, HTN and CVD alone are more than sufficient to lead to the COVID-19 age-based death rates that have been seen. This means that the overwhelming majority of deaths caused by COVID-19 have occurred in people who were already sick with other diseases, particularly cardiovascular and respiratory diseases, and these were more important than age in predicting death.

In short, don't worry about being old. Worry about being sick.

age group	% mortality (a)	% with				Mortality rate with (a)			
		HTN (b)	DM (c)	CVD (d)	COPD (e)	HTN	DM	CVD	COPD
80+	14.80%	63.10%	26.80%	82.60%	10.45%	10.40%	10.00%	13.60%	25.00%
70-79	8.00%	63.10%	26.80%	72.95%	10.45%	10.40%	10.00%	13.60%	25.00%
60-69	3.60%	63.10%	26.80%	72.95%	9.35%	10.40%	10.00%	13.60%	25.00%
50-59	1.30%	33.20%	17.50%	38.40%	9.35%	10.40%	10.00%	13.60%	25.00%
40-49	0.40%	33.20%	17.50%	38.40%	5.70%	10.40%	10.00%	13.60%	25.00%
30-39	0.20%	7.50%	4.20%	11.85%	3.05%	10.40%	10.00%	13.60%	25.00%
20-29	0.20%	7.50%	4.20%	11.85%	3.05%	10.40%	10.00%	13.60%	25.00%
10-19	0.20%	0.00%	4.20%	11.85%	2.50%	10.40%	10.00%	13.60%	25.00%
under 10	0.00%	0.00%	4.20%	11.85%	2.50%	10.40%	10.00%	13.60%	25.00%

age group	Mortality attributable to (f)							
	HTN	DM	CVD	COPD	HTN + CVD	unattributed	all comorbidities	unattributed
80+	6.56%	2.68%	11.23%	2.61%	17.80%	-3.00%	23.09%	-8.29%
70-79	6.56%	2.68%	9.92%	2.61%	16.48%	-8.48%	21.78%	-13.78%
60-69	6.56%	2.68%	9.92%	2.34%	16.48%	-12.88%	21.50%	-17.90%
50-59	3.45%	1.75%	5.22%	2.34%	8.68%	-7.38%	12.76%	-11.46%
40-49	3.45%	1.75%	5.22%	1.43%	8.68%	-8.28%	11.85%	-11.45%
30-39	0.78%	0.42%	1.61%	0.76%	2.39%	-2.19%	3.57%	-3.37%
20-29	0.78%	0.42%	1.61%	0.76%	2.39%	-2.19%	3.57%	-3.37%
10-19	0.00%	0.42%	1.61%	0.63%	1.61%	-1.41%	2.66%	-2.46%
under 10	0.00%	0.42%	1.61%	0.63%	1.61%	-1.61%	2.66%	-2.66%

Note: According to (a) the effects of multiple comorbidities are at least additive

(a) He, Jian-xing (2020/01/01). Comorbidity and its impact on 1,590 patients with COVID-19 in China: A Nationwide Analysis. , , 2020.02.25.20027664-

(b) Fryar CD, Ostchega Y, Hales CM, Zhang G, Kruszon-Moran D. Hypertension prevalence and control among adults: United States, 2015–2016. NCHS data brief, no 289. Hyattsville, MD: National Center for Health Statistics. 2017.

(c) Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2020. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2020.

(d) Yazdanyar, A., & Newman, A. B. (2009). The burden of cardiovascular disease in the elderly: morbidity, mortality, and costs. Clinics in geriatric medicine, 25(4), 563–vii. <https://doi.org/10.1016/j.cger.2009.07.007>

(e) Akinbami LJ, Liu X. Chronic obstructive pulmonary disease among adults aged 18 and over in the United States, 1998–2009. NCHS data brief, no 63. Hyattsville, MD: National Center for Health Statistics. 2011.

(f) Calculated as mortality rate in Wuhan data X % with comorbidity in general population