

Ag100 5/29/20

SARS-COV2/COVID: What the data shows of risk



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SARS-COV2 risk

Mid-March.

New coronavirus (SARS-COV2).

6 other human coronaviruses

4 are human commensals (“cold viruses”)

MERS: Infection Mortality Rate = <60y, 20%; >60y, 45%.

SARS-COV1: Infection Mortality Rate = <60y, 15%; >60y, 50%

Mathematical models.

“All models are wrong; though some are useful”.

Risk

1. Human lives (others, US).

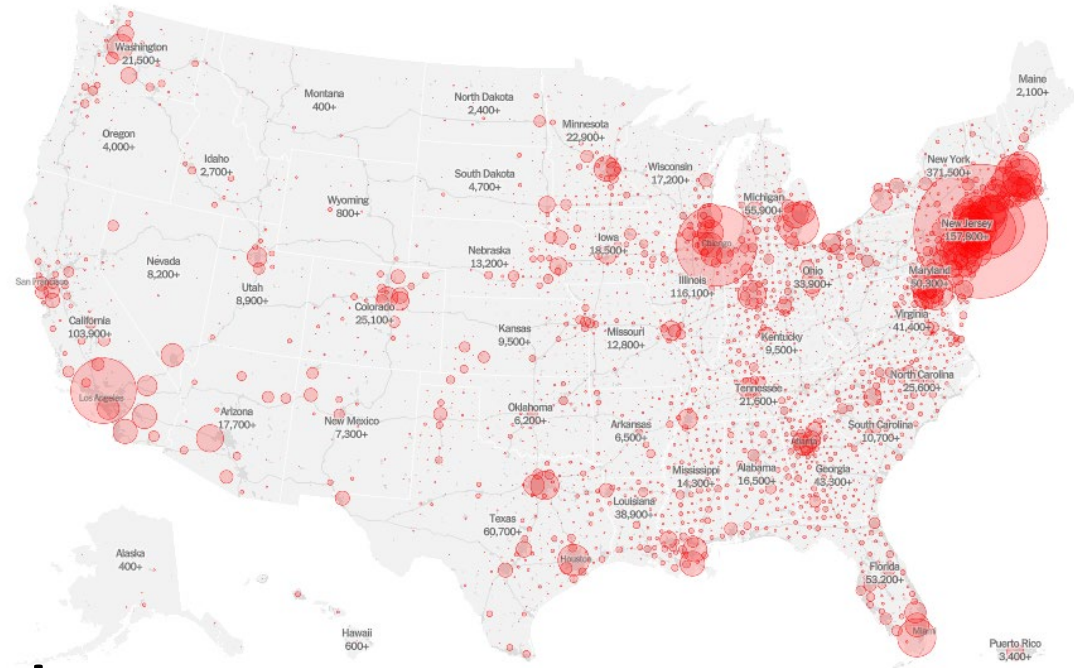
2. Economy

3. Your life/a loved one's life.

SARS-COV2 risk vs “COVID19” (the disease)

Mid-May to today.

- March and April data.
- First serology data.
- Cluster effect.
- Locality effect.
- Risk factors and how to avoid them.
- Cannot escape the *exponential* biology—when COVID gets out of hand it gets out of hand really fast and really big.
- Understanding the pathophysiology (Ann Sklus-Ray).



Risk

Press/media almost never include a denominator but report absolute numbers.

“The US now has more cases than Italy...” 332M people vs 60M. >5.5X

Morbidity and Mortality rates

Cause-specific death rate. Number of deaths assigned to a specific cause divided by the population.

Case fatality rate. The proportion of diagnosed cases that lead to death.

Case a/symptomatic rate: The proportion of infected people who have symptoms, or no symptoms after infection.

Hospitalization fatality rate (HFR). The proportion of diagnosed cases that were hospitalized that lead to death.

Infection fatality rate (IFR). The proportion of infected people who died—includes asymptomatic and mild cases who don't seek medical treatment.

IMPOSSIBLE TO GET HOLD OF DECENT DATA



A screenshot of the New York State Health Data NY website. The page features a dark blue header with navigation links: 'HEALTH DATA NY', 'DATA.NY.GOV', 'DEVELOPERS', 'HELP', and 'ABOUT'. A search bar is present with the text 'Search Health Data NY'. The main content area shows a large image of a virus particle with the text 'COVID-19 Data' and a description: 'Browse, download, and analyze COVID-19-related data from the New York State Department of Health. The data will be updated on a daily basis.'

Kind of...

New York State

22,469 fatalities

$R^2 = 0.98$

COVID death rate by age cohort.

80+ years; 1.1%

70-79 year; just over 1/2 of 1%

60-69 years; < 1/4 of 1%

50-59 years; 8/100 of 1%

40-49 years; < 3/100 of 1%

30-39 years; 1/100 of 1%

20-29 years; < 3/1,000 of 1%

10-19 years; < 4/10,000 of 1%

0-9 years; < 2/10,000 of 1%

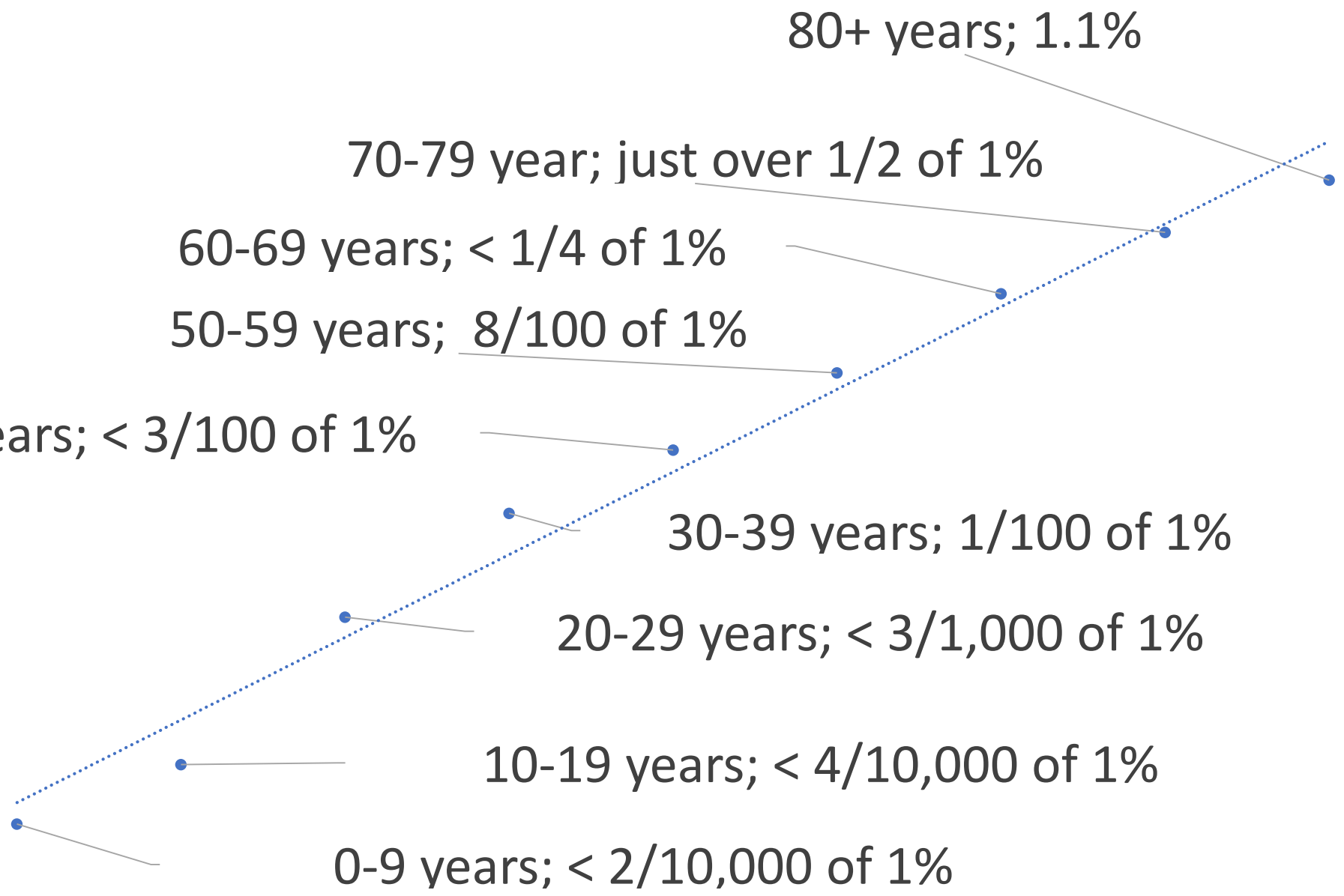
1.0000%

0.1000%

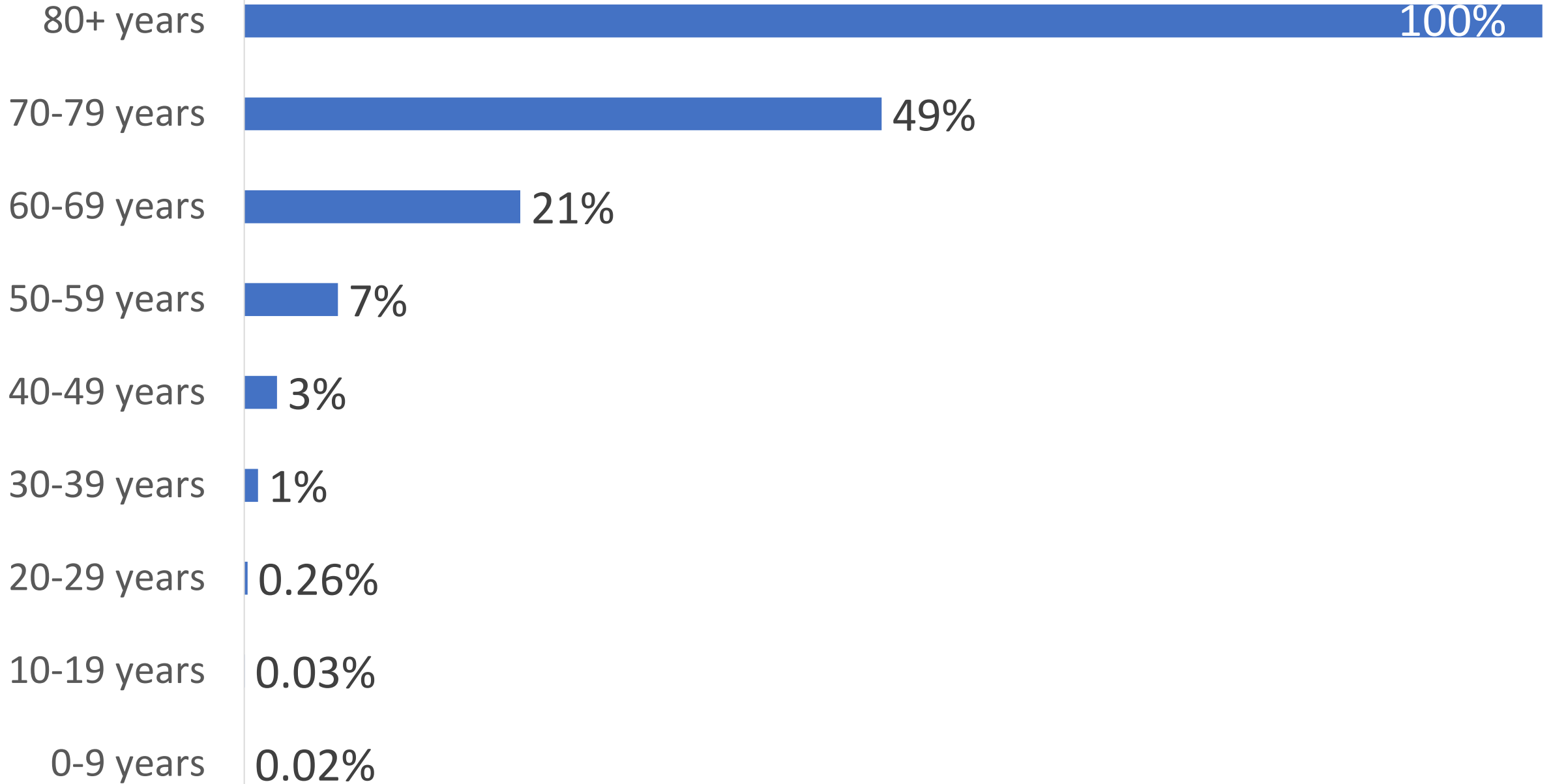
0.0100%

0.0010%

0.0001%



Risk relative to 80+ age cohort

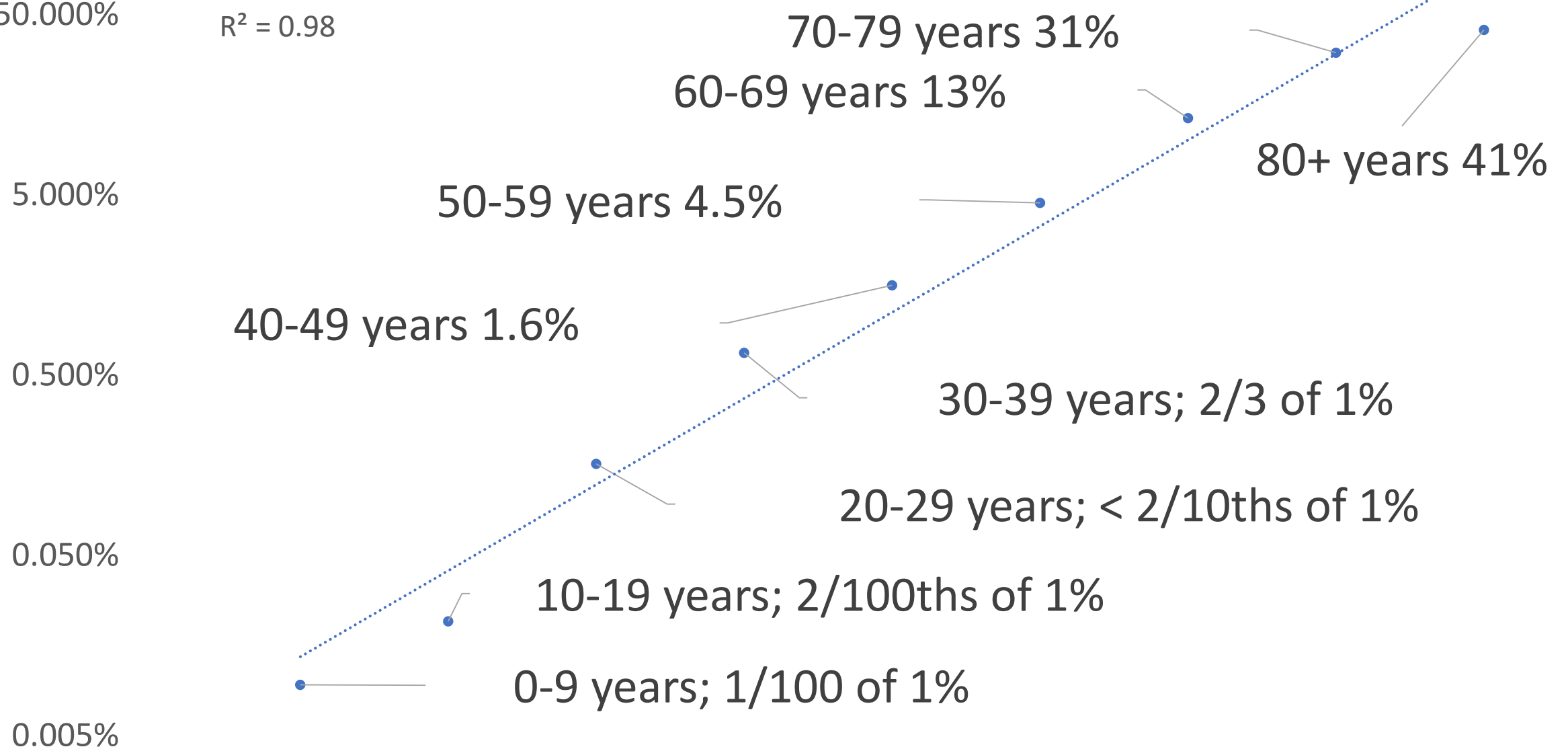


Case fatality rate (SARS-COV2 RNA PCR +ve).

New York State

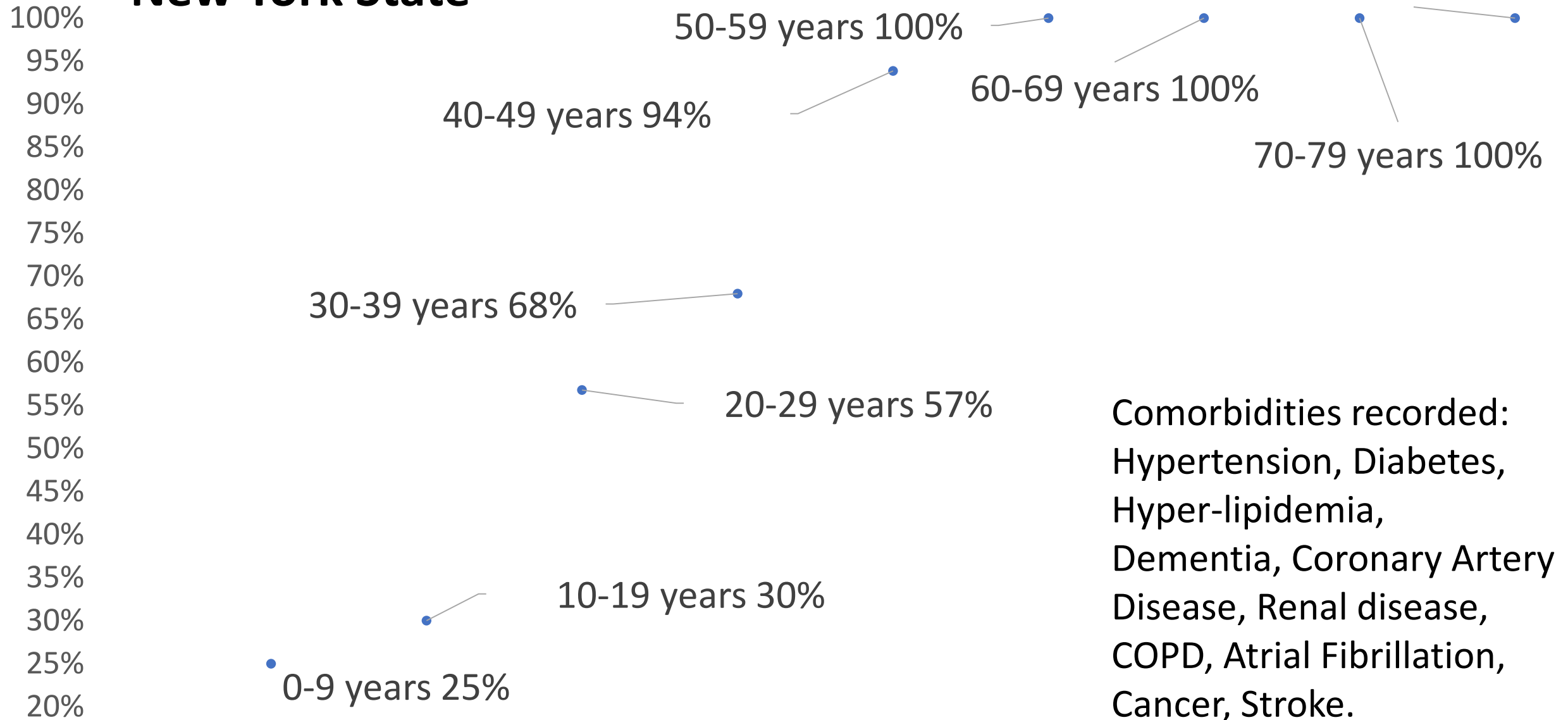
50.000%

$R^2 = 0.98$



Likelihood of COVID death having at least one **diagnosed/known** comorbidity

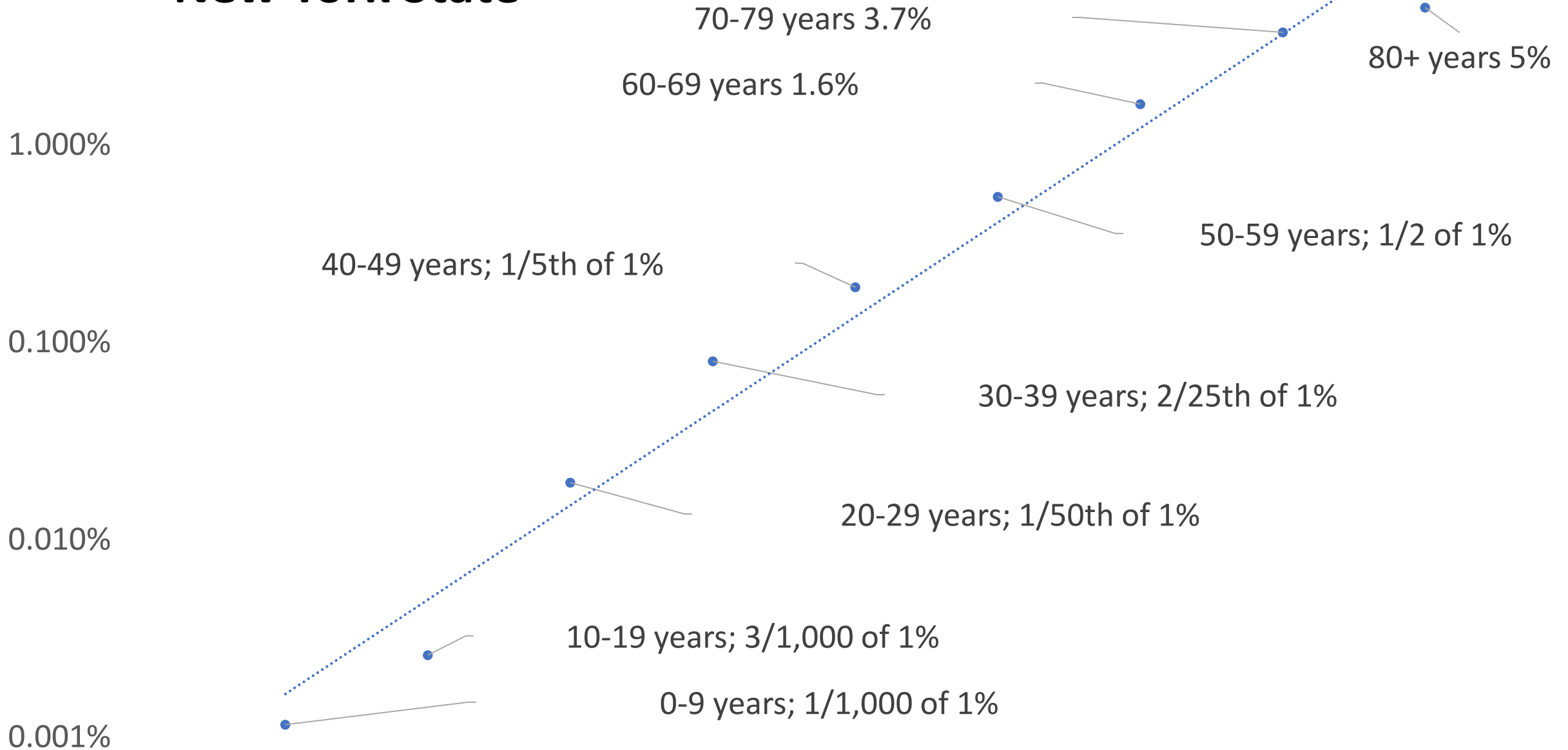
New York State



Infection mortality rate by estimated number with anti-SARS-COV2 antibody

10.000%

New York State



LOCATION	Prevalance of SARS-COV2 serum antibody	Estimated No. infected	Date-matched No. Deaths	Inf. Mortality Rate	Predicted No. of US Deaths
Guilan, Iran	33.0%	770,000	617	0.07%	232,400
Boise, Idaho	1.8%	7,023	14	0.16%	531,200
Geneva, Switzerland	9.7%	48,500	243	0.40%	1,328,000
Kobe, Japan,	2.7%	40,999	10	0.02%	66,400
Blood donors, Denmark	1.7%	64,600	53	0.07%	232,400
Oise, France	25.9%	1,548,000	635	0.03%	99,600
Wuhan, China	10.0%	1,108,000	3869	0.31%	1,029,200
Blood donors, Netherlands	2.7%	371,119	344	0.09%	298,800
Gangelt, Germany	20.0%	2,519	7	0.25%	830,000
Rio Grande do Sol, Brazil	0.3%	35,153	50	0.11%	365,200
Blood donors, Scotland	1.2%	64,800	47	0.06%	199,200
Santa Clara, California	2.6%	51,000	94	0.17%	564,400

John P.A. Ioannidis, (in review, The infection fatality rate of COVID-19 inferred from seroprevalence data) Prevalence and inferred infection fatality rates

0.10% **342,881**

0.14% **470,745**

US places	% popn infected	Infection Mortality Rate	Predicted No. of US Deaths
Boston (750 people)	10.00%	0.90%	2,988,000
Boston suburb of Chelsea (40,000 residents)	32.00%	0.73%	2,412,188
LA: 863 adults were selected through a market research firm to represent the makeup of the county	4% (300,000)	0.15%	498,000
Miami-Dade (U. Miami) Florida Power & Light to generate phone numbers in targeted demographic areas, leading to a more randomized selection of participants	6% (~165,000 residents). "half reported zero symptoms 14-17d before blood sample".	0.17%	564,400
New York State	12.3%	0.80%	2,656,000
Santa Clara 3,300 people by social media	2.6%	0.17%	564,400
		0.36%	1,203,383
		0.49%	1,613,831

CDC's current best estimates (excluding serology)	Age (y)		
	0-49	50-64	65+
Symptomatic Case Fatality Ratio	0.05%	0.20%	1.30%
Symptomatic Case Hospitalization Ratio	1.70%	4.50%	7.40%
Percent of infections that are asymptomatic	35%-50%	35%-50%	35%-50%
Infectiousness of asymptomatic individuals relative to symptomatic individuals	100%	100%	100%

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html>

	Est No. infected (serol+PCR)	Inf. Mortality Rate	Estimated No. of total Deaths	COVID deaths as of today	Serology/PCR
Pima Co	37,950	0.46%	4,764	186	33%
Yuma Co	5,809	0.12%	256	11	28%

Other Cause	Mortality Rate	Pima	Yuma
Road fatalities	0.01%	114	23
Cancer	0.17%	1,801	368
Heart disease	0.18%	1,921	392

Age of deaths	<20y	20-44y	45-54y	55-64y	65+
AZ data	2	39	43	103	670
	0.2%	4.6%	5.0%	12.0%	78.2%

Improving your odds.

- 1.Lie about your age

- 2.Deal with your risk factors



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THE CORONAVIRUS CRISIS

Antibody Tests Point To Lower Death Rate For The Coronavirus Than First Thought

May 28, 2020 · 1:11 PM ET



JON HAMILTON