~ Historical Perspective[1] ~

Here I compare COVID numbers to previous pandemics. Keep in mind that both the Asian Flu and the Hong Kong Flu have become, essentially, blips on the historical record. They rarely come to mind when speaking of these years, especially the 1968 pandemic which was overshadowed by racial unrest, space flight, the Vietnam War, and Woodstock.

The tables below speak for themselves, but for me the most surprising comparison is listed first. I compare the ***annual*** COVID death rate from the past 14 months to the number of worldwide deaths from pneumonia during the single 2017-2018 season – just 3 years ago. The numbers are absolutely comparable, but does anyone really even remember the deaths from pneumonia in the 2017-2018 season? No. This is so routine that we hardly notice it; it certainly doesn't make the news. And yet, our obsession with COVID has absolutely taken over our lives. Also noteworthy is the fact that the vast majority of deaths from pneumonia affect children,[2] whereas 40% of deaths from COVID occur among 0.6% of the population[3] – namely, those whose continued life expectancy is 5 months (i.e. among older people in assisted living facilities, where the average life expectancy, once entering the facility, is 5 months).[4]

Pneumonia Statistics (2017-2018)

2,560,000	Annual Deaths Worldwide from Pneumonia[5]
2,762,565	Annual Deaths Worldwide from COVID[6]

[1] In this essay, I am speaking in a personal capacity as a mathematician and do not intend to represent the views of Winona State University. These documents began as my attempt to organize for myself information which complements and even challenges the dominant narrative on COVID-19. It was not my intent to make them publicly available, but enough people have found them helpful that I decided to do that. Unlike government bureaucrats and social media fact-checkers, I do not claim to be infallible. I am simply a classical liberal who is quite concerned at the lack of robust conversation around such an important topic.

[2] https://ourworldindata.org/pneumonia

[3] See More Than 40% of U.S. Coronavirus Deaths Are Linked to Nursing Homes, NY Times, 7/30/2020 (https://www.nytimes.com/interactive/2020/us/coronavirus-nursing-homes.html?action=click&module=Spotlight&pgtype=Homepage); The Most Important Coronavirus Statistic: 42% Of U.S. Deaths Are From 0.6% Of The Population, Forbes, 5/26/2020

[4] https://www.geripal.org/2010/08/length-of-stay-in-nursing-homes-at-end.html. Relevant statistics: the median length of stay in a nursing home before death was 5 months; 65% died within 1 year of nursing home admission; 53% died within 6 months of nursing home admission.

[5] https://ourworldindata.org/pneumonia

[6] The number of deaths worldwide from COVID as of 5/03/2021 is 3,222,993, but this encompasses a 14 month period.

See More Tables on the Following Page

Asian Flu Statistics (1957-1958)

2,000,000	Deaths worldwide, WHO[7]
2.500	Times more people now in the world
5,000,000	Deaths from Asian Flu in today's numbers
3,222,993	Total COVID Deaths worldwide, 5/03/2021[8]
69.6	DEATHS PER 100,000 (compared to 41.0 COVID deaths per 100,000)

Hong Kong Flu Statistics (1968-1969)

2,500,000	Deaths worldwide, WHO[9]
2.214	Times more people now in the world
5,535,033	Deaths from Hong Kong Flu in today's numbers
3,222,993	Total COVID Deaths worldwide, 5/03/2021[10]
70.4	DEATHS PER 100,000 (compared to 41.0 COVID deaths per 100,000)

Spanish Flu Statistics (1918-1920)

50,000,000	Deaths worldwide[11]
4.3	Times more people now in the world
217,000,000	Deaths from Spanish Flu in today's numbers
3,222,993	Total COVID Deaths worldwide, 5/03/2021[12]
2,777.8	DEATHS PER 100,000 (compared to 41.0 COVID deaths per 100,000)

For comparison to our experience with COVID-19, all that has transpired in the last year would have to occur every single year for the next 78 years[13] for our COVID-19 experience to be comparable to the death toll from the 1918 Spanish Flu. When people even dare to equate COVID-19 to the Spanish Flu, they are orders of magnitude off; it is an absolutely ridiculous comparison. Furthermore, to contend that this is the

[7] Actually, about 1,000,000 to 4,000,000 (https://www.sinobiological.com/research/virus/1957-influenza-pandemic-asian-flu) and (https://www.britannica.com/event/1968-flu-pandemic).
[8] See https://www.worldometers.info/coronavirus/, accessed on 5/03/2021.
[9] Actually, about 1,000,000 to 4,000,000, with the WHO settling on "about 2 million." (https://www.sinobiological.com/research/virus/1957-influenza-pandemic-asian-flu)
[10] See https://www.worldometers.info/coronavirus/, accessed on 5/03/2021.
[11] The World Health Organization puts the death toll at 50 million. See https://www.who.int/influenza/spotlight and https://web.archive.org/web/20200407204000/https://www.washingtonpost.com/graphics/2020/local/retropolis/coronavirus-deadliest-pandemics/
[12] See https://www.worldometers.info/coronavirus/, accessed on 5/03/2021.
[13] Using the annual death rate of 2,762,565 for COVID-19 from the past 14 months of data.

worst pandemic since the Spanish Flu is also untrue, as we can see from the comparison with the Asian and Hong Kong Flus above.

~ Leading Causes of Death Perspective ~

Using the CDC data analysis tool to download data on Leading Causes of Death (LCD) per age group, I inserted the COVID-19 death counts from the CDC and computed deaths per capita.

1. The latest complete LCD data available from the CDC is for 2018:[14]
   - I downloaded that LCD data for the 5-year period 2014-2018 to find a 5-year average for each cause of death for each age group.
   - Before averaging, I adjusted each year's the counts according to the latest estimates of population for each of the age groups in 2020.[15] That is, I adjusted the numbers to reflect comparable numbers in the 2020 population versus the years for which the counts were collected.
2. I added in the COVID-19 counts to the LCD in the following manner, pro-rating them by a factor of 365/420, since we are comparing annual death rates and the COVID deaths represent 420 days of data.
3. I chose only 3 specific age groups, because collecting and compiling the data is an onerous, time-consuming task!

Included is a ranked list of the LCD, 5-year average estimate for 2020, with COVID-19 information clearly highlighted. In the chart on the next page are the death rates from all causes as well as for COVID-19 alone. To the right is a chart of Leading Causes of Death, including COVID-19, for 2020. Bear in mind that the "Unintentional Injury" classification includes drug overdose deaths as well as automobile accidents, etc.

Notice what the result implies:

1. First, deaths in this demographic are extremely rare – just 73 per 100,000 and, among those very small number of deaths, 96.74% of them will have died from something other than COVID.
2. Secondly, if deaths from COVID-19 in the 15-24 year-old age group were evenly distributed across the United States (they are not, of course, but are rather clustered among less healthy populations),

[14] https://webappa.cdc.gov/sasweb/nkcipc/leadcause.html. The CDC has provisional data now available for 2019, but they have not checked all of the death certificates and so it is not clear how reliable it is.
[15] https://www.census.gov/data/tables/2018/demo/age-and-sex/2018-age-sex-composition.html for historical populations by age group and https://www.livepopulation.com/country/united-states.html for current population estimates by age group

and if we were to collect together 7.5 universities the size of WSU, we could expect only 1 student at 1 of those 7.5 universities to die in the coming year from COVID-19.

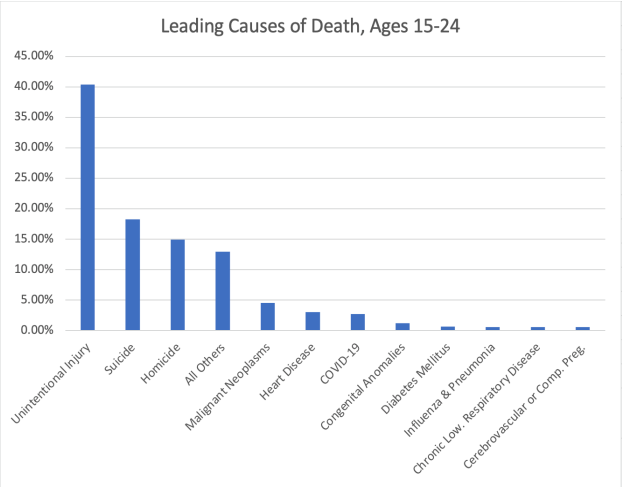
3. More importantly, the director of the CDC reminded us that, "We're seeing, sadly, far greater suicides now than we are deaths from COVID…We're seeing far greater deaths from [excess] drug overdose…than we are seeing deaths from COVID."[16] What is more, the CDC reported on 8/14/2020 that fully 1 in 4 college-aged people considered suicide during the pandemic. In other words, more deadly than COVID itself are the social and economic ramifications from the lockdown and anxiety.[17] That we are killing more young people from our reaction to COVID rather than from COVID itself is never discussed. If one would like to discuss actions regarding the "common good" and "being in this together," this would seem to qualify.
4. In fact, fodder for a much-needed discussion is the evidence that lockdown measures have done almost nothing to affect the case rates: "After subtracting the epidemic and lrNPI effects, we find no clear, significant beneficial effect of mrNPIs on case growth in any country. In France, for example, the effect of mrNPIs was +7% (95% CI: −5%-19%) when compared with Sweden and + 13% (−12%-38%) when compared with South Korea (positive means pro-contagion)."[18] What the lockdowns have done, aside from devastating economies, is increase suicides and drug overdoses,[19] even doubling them according to one JAMA study.[20] In fact, a study published on the Journal of the American Medical Association website found that fully 1/3 of the deaths in the United States were not due to COVID-19 but to unintended consequences of the mitigation measures.[21] Perhaps more importantly, the U.N. warns that a secondary effect of the lockdowns could mean 265,000,000 excess starvations.[22]

See Charts on the Following Page

[16] Webinar given by acting director of the CDC, Dr. Robert Redfield, MD, at Buck Institute, 7/14/2020 (https://www.buckinstitute.org/covid-webinar-series-transcript-robert-redfield-md/)
[17] See https://www.cdc.gov/mmwr/volumes/69/wr/mm6932a1.htm
[18] https://onlinelibrary.wiley.com/doi/10.1111/eci.13484
[19] See the article, *From Starvation To Overdose, Coronavirus' Hidden Toll Emerges In Colorado's Death Data,* from Colorado Public Radio: https://www.cpr.org/2021/02/16/from-starvation-to-overdose-coronavirus-hidden-toll-emerges-in-colorados-death-data/
[20] https://jamanetwork.com/journals/jama/fullarticle/2779399?utm_source=silverchair&utm_campaign=jama_network&utm_content=covid_weekly_highlights&utm_medium=email
[21] https://www.washingtonexaminer.com/news/one-third-of-excess-deaths-in-us-during-pandemic-were-not-due-to-the-coronavirus-study
[22] https://www.msn.com/en-us/news/world/covid-could-push-265-million-people-to-starvation-if-action-not-taken-un/ar-BB16PQDq

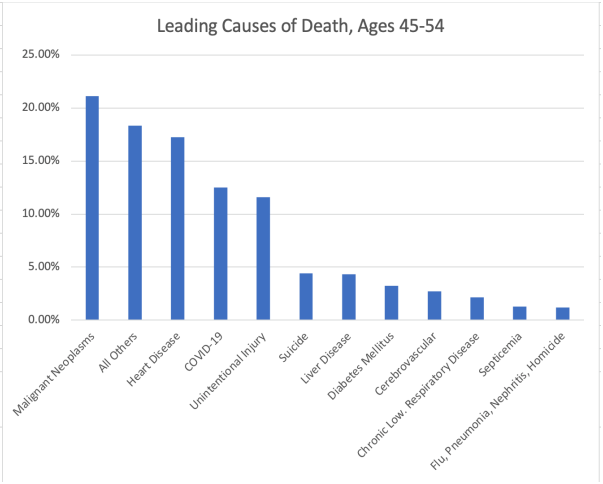
For 15-24 Year Old Age Group

Rank	Causes of Death: 15-24 YO	Deaths	Percentile	Percent
0	All Deaths	31,442	N/A	100.00%
1	Unintentional Injury	12,697	0.00%	40.38%
2	Suicide	5,737	58.63%	18.25%
3	Homicide	4,703	73.58%	14.96%
4	All Others	4,060	86.50%	12.91%
5	Malignant Neoplasms	1,438	91.07%	4.57%
6	Heart Disease	940	94.06%	2.99%
7	COVID-19	844	96.74%	2.68%
8	Congenital Anomalies	371	97.92%	1.18%
9	Diabetes Mellitus	216	98.61%	0.69%
10	Influenza & Pneumonia	192	99.22%	0.61%
11	Chronic Low. Respiratory Disease	187	99.82%	0.60%
12	Cerebrovascular or Comp. Preg.	169	100.35%	0.54%
	Population, Ages 15-24, 2020	42,626,971		
	Percent Population Dying from Any Cause	0.07376%	73.2 per 100,000	5.70 per 7788 (WSU)
	Percent Population Dying from COVID-19	0.00198%	1.98 per 100,000	0.154 per 7788 (WSU)



For 45-54 Year Old Age Group

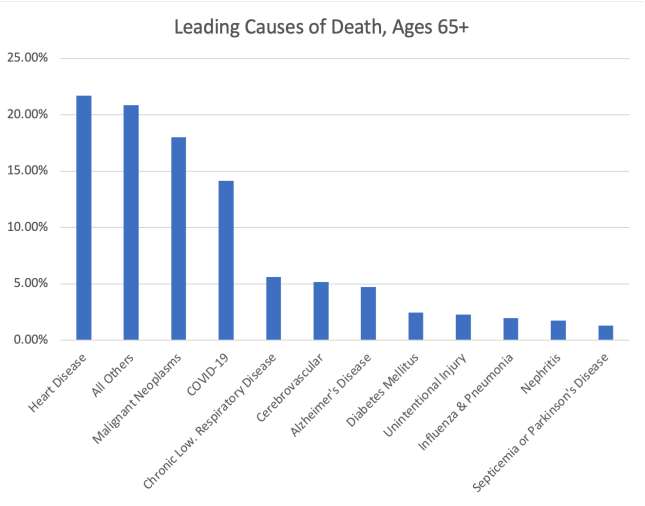
Rank	Cause of Death: 45-54 YO	Deaths	Percentile	Percent
0	All Deaths	188,981	N/A	100.00%
1	Malignant Neoplasms	39,874	0.00%	21.10%
2	All Others	34,629	39.42%	18.32%
3	Heart Disease	32,562	56.65%	17.23%
4	COVID-19	23,589	69.14%	12.48%
5	Unintentional Injury	21,927	80.74%	11.60%
6	Suicide	8,313	85.14%	4.40%
7	Liver Disease	8,208	89.48%	4.34%
8	Diabetes Mellitus	6,085	92.70%	3.22%
9	Cerebrovascular	5,107	95.40%	2.70%
10	Chronic Low. Respiratory Disease	4,038	97.54%	2.14%
11	Septicemia	2,395	98.81%	1.27%
12	Flu, Pneumonia, Nephritis, Homicide	2,253	100.00%	1.19%
	Population, Ages 45-54, 2020	41,102,443		
	Percent Population Dying from Any Cause	0.45978%	440 per 100,000	4.38 per 1013 (WSU Employees)
	Percent Population Dying from COVID-19	0.05739%	66.0 per 100,000	0.67 per 1013 (WSU Employees)



That is, if we assume the WSU employees largely fall into this age group (not exactly true, but not a horrible approximation), and if we were to collect together 1.5 universities the size of WSU, then we could expect, perhaps, the death of 1 employee at 1 of these institutions this coming year from COVID-19.

For 65+ Year Old Age Group

Rank	Cause of Death: 65+ YO	Deaths	Percentile	Percent
0	All Deaths	2,748,524	N/A	100.00%
1	Heart Disease	596,825	0.00%	21.71%
2	All Others	573,355	42.57%	20.86%
3	Malignant Neoplasms	495,377	60.60%	18.02%
4	COVID-19	388,522	74.73%	14.14%
5	Chronic Low. Respiratory Disease	154,280	80.35%	5.61%
6	Cerebrovascular	142,220	85.52%	5.17%
7	Alzheimer's Disease	130,175	90.26%	4.74%
8	Diabetes Mellitus	66,897	92.69%	2.43%
9	Unintentional Injury	62,155	94.95%	2.26%
10	Influenza & Pneumonia	54,284	96.93%	1.98%
11	Nephritis	48,288	98.68%	1.76%
12	Septicemia or Parkinson's Disease	36,146	100.00%	1.32%
	Population, Ages 65+, 2020	55,731,990		
	Percent Population Dying from Any Cause	4.93168%	4932 per 100,000	
	Percent Population Dying from COVID-19	0.69713%	697 per 100,000	



Several salient observations can be made for this last group.

- For comparison, if we were to assume that all students at WSU were in this age group (that is, retired with some in assisted living facilities!), we would still expect only 34 deaths from COVID at WSU alone this coming academic year. This belies the misconception that for older people, COVID is a veritable death sentence.
- It is important to notice that 0.62% of the population, most over 65 years of age, are in assisted living facilities, but 43% of the deaths from COVID have occurred in that demographic – not just in the over 65 age group, but among those in assisted living facilities.[23]
- Additionally, according to the CDC analysis, fully 94% of those who have died from COVID-19 in the United States had an average of 2.6 comorbid conditions; in only 6% of the deaths was COVID-19 the only factor in the death and not just a trigger event in an already health-compromised individual.[24] If we were to seek the death toll from COVID alone, it would be 35,352, not the 591,108[25] that is currently being reported.

[23] See More Than 40% of U.S. Coronavirus Deaths Are Linked to Nursing Homes, NY Times, 7/30/2020 (https://www.nytimes.com/interactive/2020/us/coronavirus-nursing-homes.html?action=click&module=Spotlight&pgtype=Homepage); The Most Important Coronavirus Statistic: 42% Of U.S. Deaths Are From 0.6% Of The Population, Forbes, 5/26/2020 (https://www.forbes.com/sites/theapothecary/2020/05/26/nursing-homes-assisted-living-facilities-0-6-of-the-u-s-population-43-of-u-s-covid-19-deaths/#79707a274cdb); Almost half of US COVID-19 deaths are linked to nursing homes, NY Post, 6/27/2020 (https://nypost.com/2020/06/27/almost-half-of-us-covid-19-deaths-are-linked-to-nursing-homes/)

[24] Weekly Updates by Select Demographic and Geographic Characteristics: Provisional Death Counts for Coronavirus Disease 2019 (COVID-19) (https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm).

[25] https://www.worldometers.info/coronavirus/country/us/, accessed on 5/03/2021.

~ IFR and Hospitalization Perspective ~

The public's perception of the danger posed by COVID-19 is grossly exaggerated, as the following statistics reveal:

1. **Hospitalizations:** "The public overestimates the likelihood a person with COVID-19 would have to be hospitalized by 10 times the actual number…People were asked during a Franklin Templeton/Gallup study what 'percentage of people who have been infected by the coronavirus needed to be hospitalized?' Thirty-five percent of those asked said that over half of infected people would require hospitalization from the disease. Meanwhile, only 18% correctly stated that the risk of hospitalization was somewhere between 1%-5%."[26]
2. **Infection Fatality Ratios:** The infection fatality ratio gives your chance of dying given that you catch COVID-19 and is also grossly exaggerated in most people's minds. A chart below shows the best current estimates of the percent chance of death for given age groups.[27] Overall, the Imperial College of London estimates the IFR to be 0.23% (meaning 99.77% of all people who contract COVID-19 live) in low-income countries with predominantly young populations and 1.15% (meaning 98.85% of those contracting COVID-19 live) in high-income countries with a large elderly population.[28] A March 26, 2021 study in the *European Journal of Clinical Investigation* puts the overall worldwide IFR at 0.15%.[29]

Age Group	IFR %	Fatalities per 100,000 People with COVID
0 - 4	0.003	3
5 - 9	0.001	1
10 - 14	0.001	1
15 - 19	0.003	3
20 - 24	0.006	6
25 - 29	0.013	13
30 - 34	0.024	24

[26] https://www.washingtonexaminer.com/news/americans-overestimate-hospitalization-covid-study
[27] https://www.acsh.org/news/2020/11/18/covid-infection-fatality-rates-sex-and-age-15163
[28] https://www.imperial.ac.uk/media/imperial-college/medicine/mrc-gida/2020-10-29-COVID19-Report-34.pdf
[29] https://onlinelibrary.wiley.com/doi/10.1111/eci.13554

35	**-**	**39**	0.040	40
40	**-**	**44**	0.075	75
45	**-**	**49**	0.121	121
50	**-**	**54**	0.207	207
55	**-**	**59**	0.323	323
60	**-**	**64**	0.456	456
65	**-**	**69**	1.075	1075
70	**-**	**74**	1.674	1674
75	**-**	**79**	3.203	3203
80	**-**	**+**	8.292	8292

3. **IFR among Elderly with Comorbidities:** Even this I found stunning. Dr. Jeffrey Johnson, a statistician at Winona State University, calculated from the CDC's data that even a person who is 70+ years old and has 3 comorbidities still has a 75% chance of surviving COVID-19.