

# **Covid19 US: Infections, Cases & Deaths**

---

by

**Milo Schield**

ASA Fellow

President: National Numeracy Network

*Nov 21, 2020*

*[www.StatLit.org/pdf/](http://www.StatLit.org/pdf/)*

*2020-Schield-Covid19-Infections-Slides-1121.pdf*

# **Goal and Approach:**

---

**#1: Estimate total infection rate: # per 100 persons**  
**How close is the US is to herd immunity?**

**#2: What did US know about co-morbidities?**  
**When was this first known?**

**#3: Compare two rates:**

- **the US daily death rate per 100 cases with**
- **the US daily death rate per 100 infections.**

**How did #2 and #3 influence social policy?**

# Infections vs. Cases

---

## Covid19:

**Infections\***(modelled): Have or had Covid: tested or not  
**Cases** (counted): Test positive for Covid.

## Flu Illness (modelled\*\*):

Since most people never tested for flu (or tests did not exist), flu illness is modelled just like Covid infections.

So Covid infections and flu illnesses are both estimated!

\* Daily infections are estimated by HealthData (IHME)

<https://covid19.healthdata.org/united-states-of-america>

\*\* [www.cdc.gov/flu/about/burden/2019-2020.htm](http://www.cdc.gov/flu/about/burden/2019-2020.htm)

# **#1: What is the US total infection rate per 100 person?**

---

Background: The IHME\* estimates the number of daily infections for the United States.

Unfortunately, the IHME does not total the daily number of infections and does not provide the daily number in a downloadable file.

Approach: either enter all the daily infections and total, or estimate the total. These slides do the latter.

\* <https://covid19.healthdata.org/united-states-of-america>

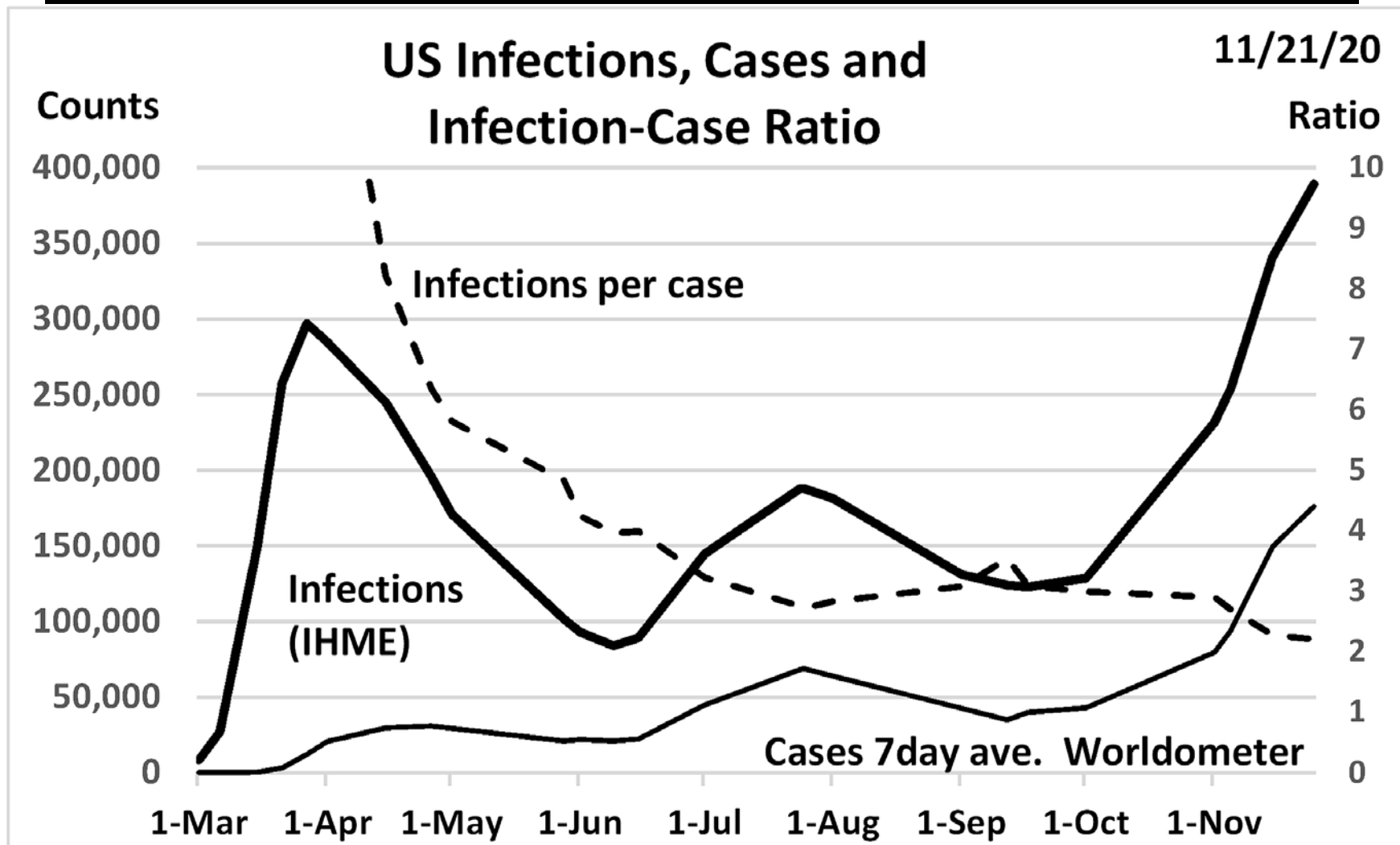
# #1: # Infections vs. # Cases

Date	Infections*	Cases7D**	Ratio
15-Mar-20	149,685	358	418
1-Apr-20	284,757	20,772	14
15-Apr-20	244,944	29,786	8.2
1-May-20	170,866	29,400	5.8
1-Jun-20	92,970	21,874	4.3
1-Jul-20	144,761	44,788	3.2
1-Nov-20	231,651	79,679	2.9
15-Nov-20	340,923	149,246	2.3
25-Nov-20	389,340	176,269	2.2

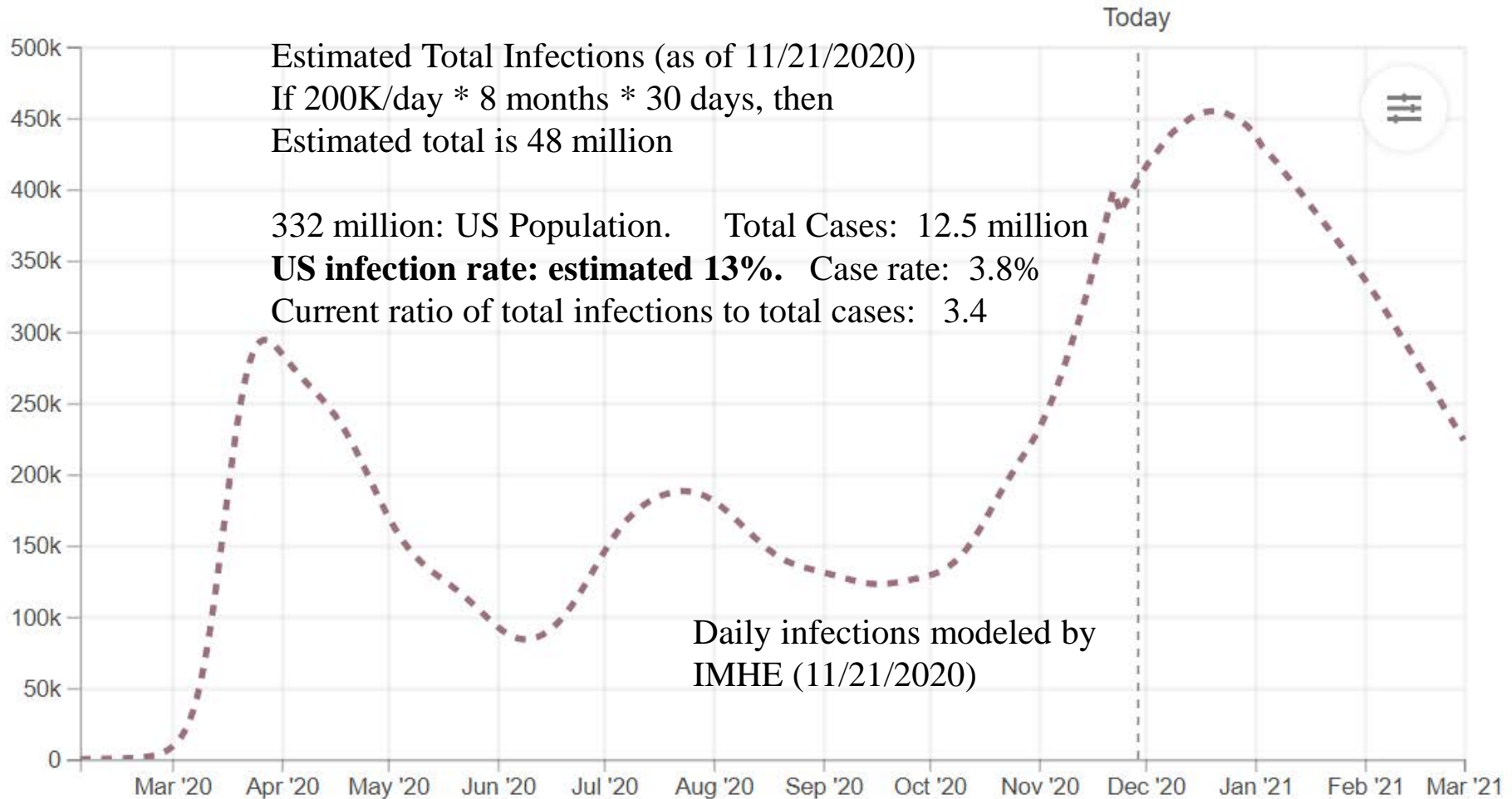
\* IHME

\*\* [Worldometers.Info/Coronavirus](https://www.worldometers.info/coronavirus)

# U.S. Covid19: Infections and Cases to Date



# #1: U.S. Covid19 Infections: Estimate Total # and Rate



## #2: Co-morbidities

### Released by WHO on 2/20/2020

Death Rate	Confirmed	All
80+	21.9%	14.8%
70-79		8.0%
60-69		3.6%
50-59		1.3%
40-49		0.4%
10-39		0.2%
0-9		None

Covid-19: China data 2/2020

Death Rate	Confirmed	All
Male	4.7%	2.8%
Female	2.8%	1.7%
All	3.8%	

Covid-19: China data 2/2020

PRE-EXISTING	Confirmed	All
Heart	13.2%	10.5%
Diabetes	9.2%	7.3%
Lung	8.0%	6.3%
Hypertension	8.4%	6.0%
Cancer	7.6%	5.6%
no pre-existing	1.4%	0.9%

Covid-19 Death Rates: China data 2/2020

Death rates / 100 cases.  
 CDC knew all of this  
 before March, 2020.



## #2: Untangling Age and Health Problems

By June 15, 2020,  
the CDC knew this:

Death rate / 100 cases  
among those with  
health problems:

In their 80s: 50%!

In their 70s: 32%!

No health problems:

In their 30s: 0.1%

Death Rate of Cases		Health Problems*	
Age	ALL (5/31)	Some	None
5	0.1%	0.6%	0.1%
15	0.1%	0.8%	0.1%
25	0.1%	1.4%	0.1%
35	0.4%	2.8%	0.1%
45	2.4%	4.5%	0.4%
55	2.4%	7.8%	0.9%
65	6.7%	16.7%	2.4%
75	16.6%	31.7%	10.2%
85	28.7%	49.7%	29.8%**

Table 3: [www.cdc.gov/mmwr/volumes/69/wr/mm6924e2.htm](http://www.cdc.gov/mmwr/volumes/69/wr/mm6924e2.htm)

\* Half of the deaths lack health condition status

\*\* Missing data explains impossible result

## #3: Death rates per 100 Cases vs. 100 Infections

Date	Infections*	Cases7**	Deaths7	Deaths7 per 100		
				Infections	Cases7	Ratio
3/15	149,685	358				
4/01	284,757	20,772				
4/15	244,944	29,786	1,960	<b>0.8%</b>	<b>6.6%</b>	<b>8.2</b>
5/01	170,866	29,400	1,938	<b>1.1%</b>	<b>6.6%</b>	5.8
6/01	92,970	21,874	1,018	<b>1.1%</b>	4.7%	4.3
7/01	144,761	44,788	556	<b>0.4%</b>	1.2%	3.2
11/01	231,651	79,679	855	<b>0.4%</b>	1.1%	2.9
11/15	340,923	149,246	1,127	<b>0.3%</b>	0.8%	2.3
11/25	389,340	176,269	1,693	<b>0.4%</b>	1.0%	<b>2.2</b>

\* IHME

\*\* Averages (7 day) [Worldometers.Info/Coronavirus](https://www.worldometers.info/coronavirus)

# Conclusion #1

---

#1: US total infection rate (11/21) is ~13%.

The US is a long way from herd immunity.

#2: March 1: old age and health problems known as leading co-morbidities. June 15: case' death rate for healthy 0 - 40 known as 0.1% versus 30% for 70s with health problems (50% for 80s).

#3: The Covid death rate per 100 infections:

- Peaked at 1.1% in May (currently 0.4%).
- Half the death rate per 100 cases

# Covid19: Two Major Mistakes

---

Covid decision-making was sabotaged by focusing on:

1. deaths *per case* instead of deaths *per infection*.
2. The death rate *overall* instead of the rates for **the unhealthy old versus the healthy young**.

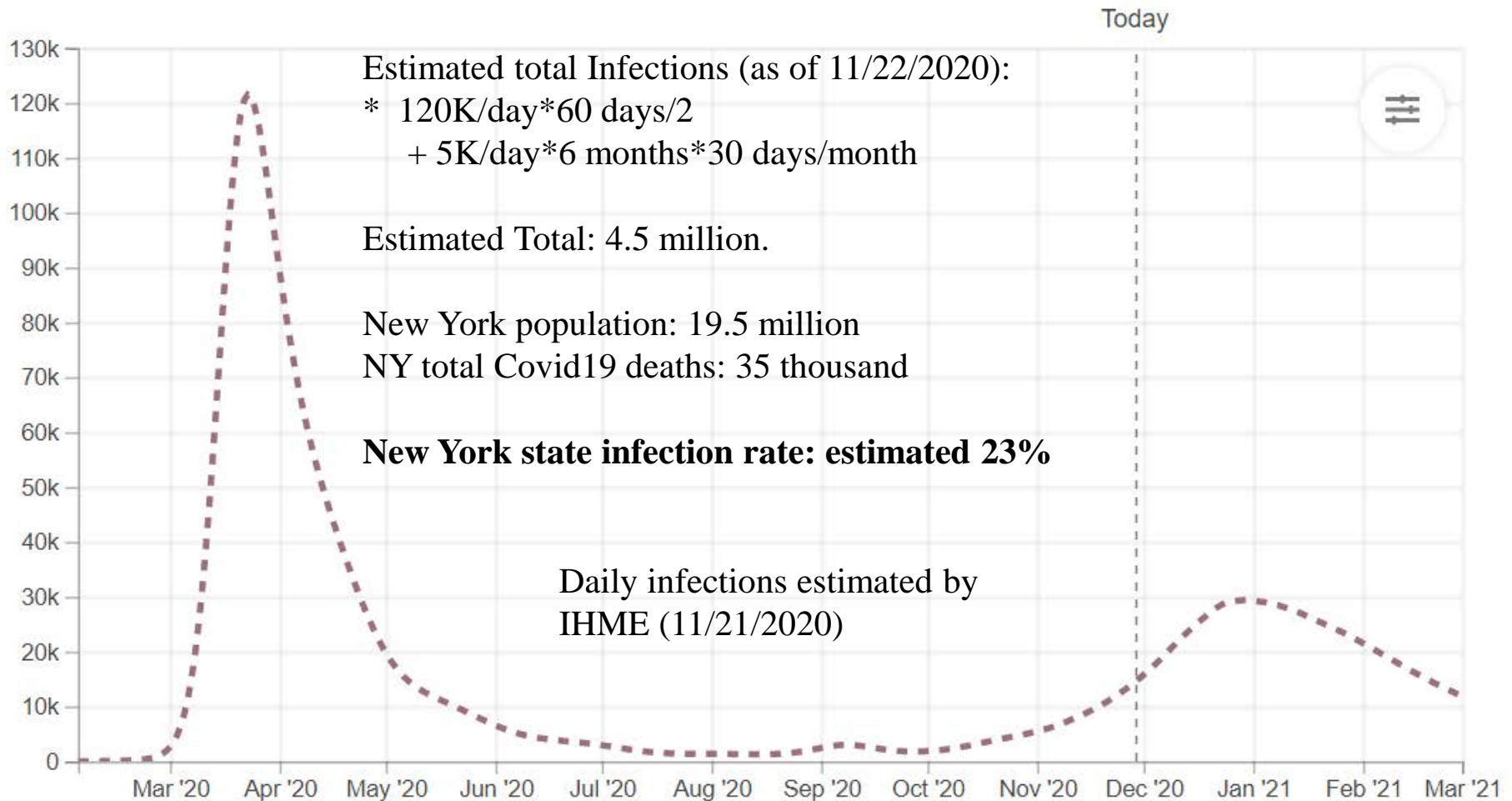
#1 made Covid much more deadly than it really was.

#2 put everyone at risk instead of just the vulnerable.

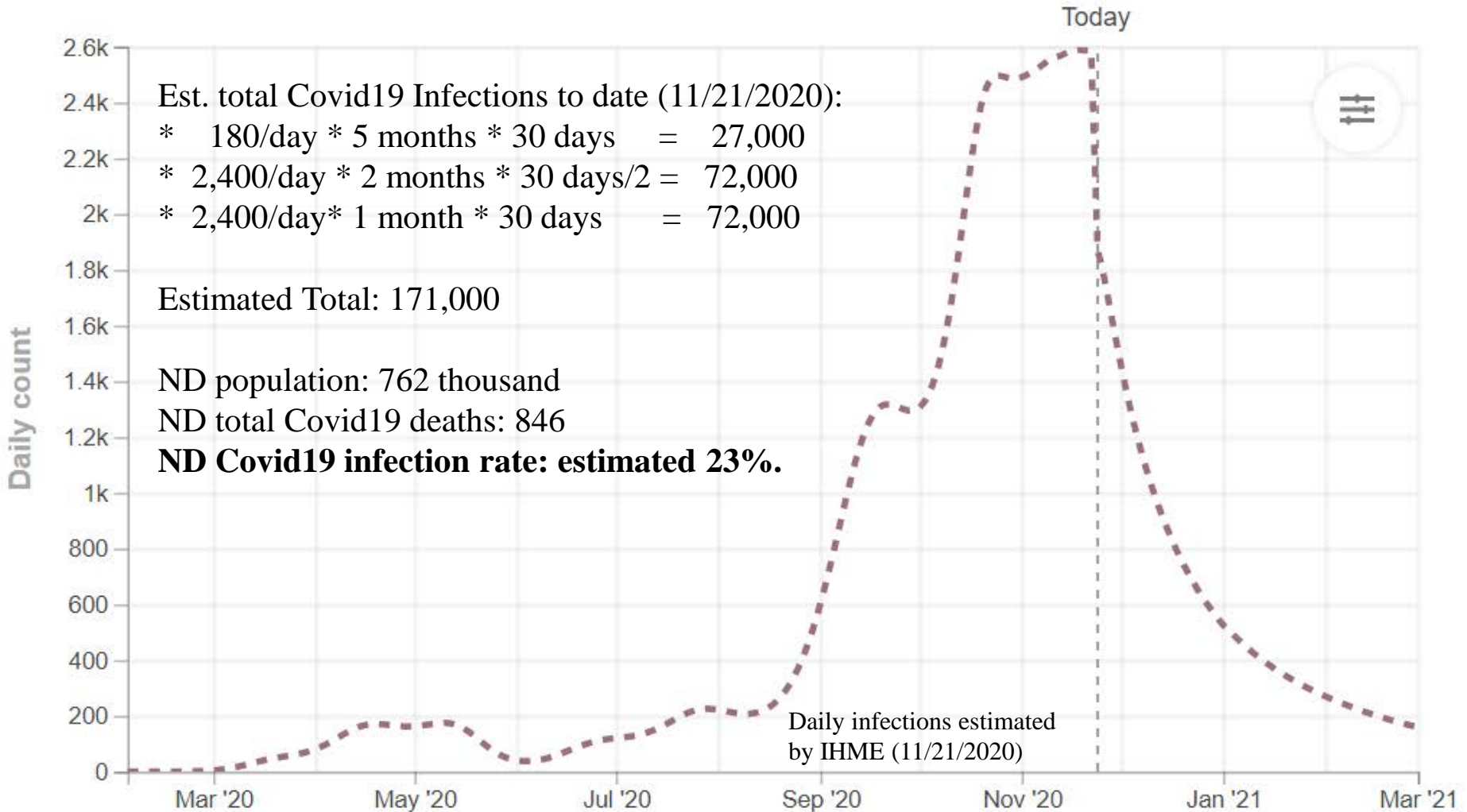
These two mistakes (and the need to “smooth the curve”):

3. were the basis for ordering a national shut down: the biggest uncontrolled quasi-experiment in history.

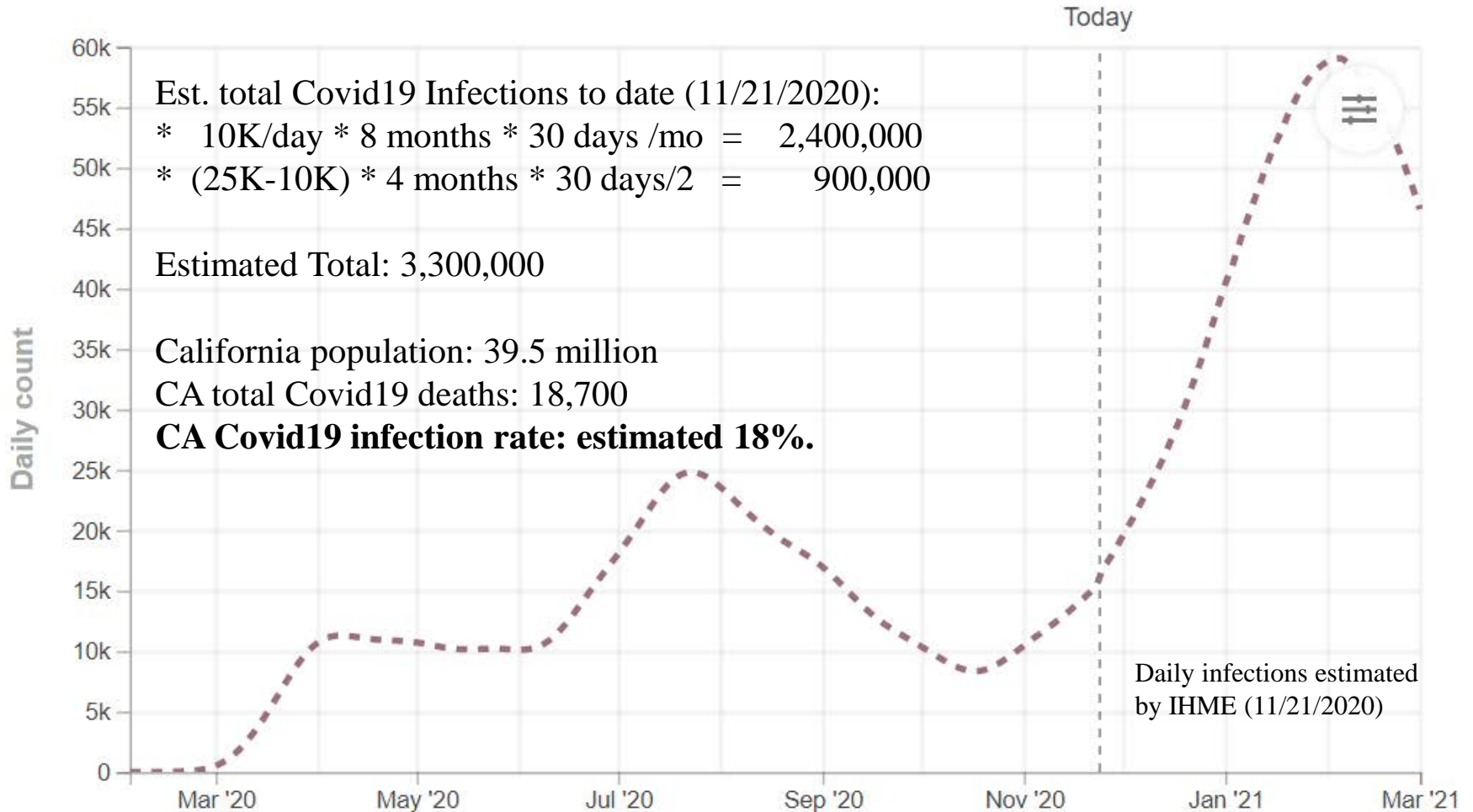
# New York Covid19 Infections: Daily. Estimate of Total-to-date



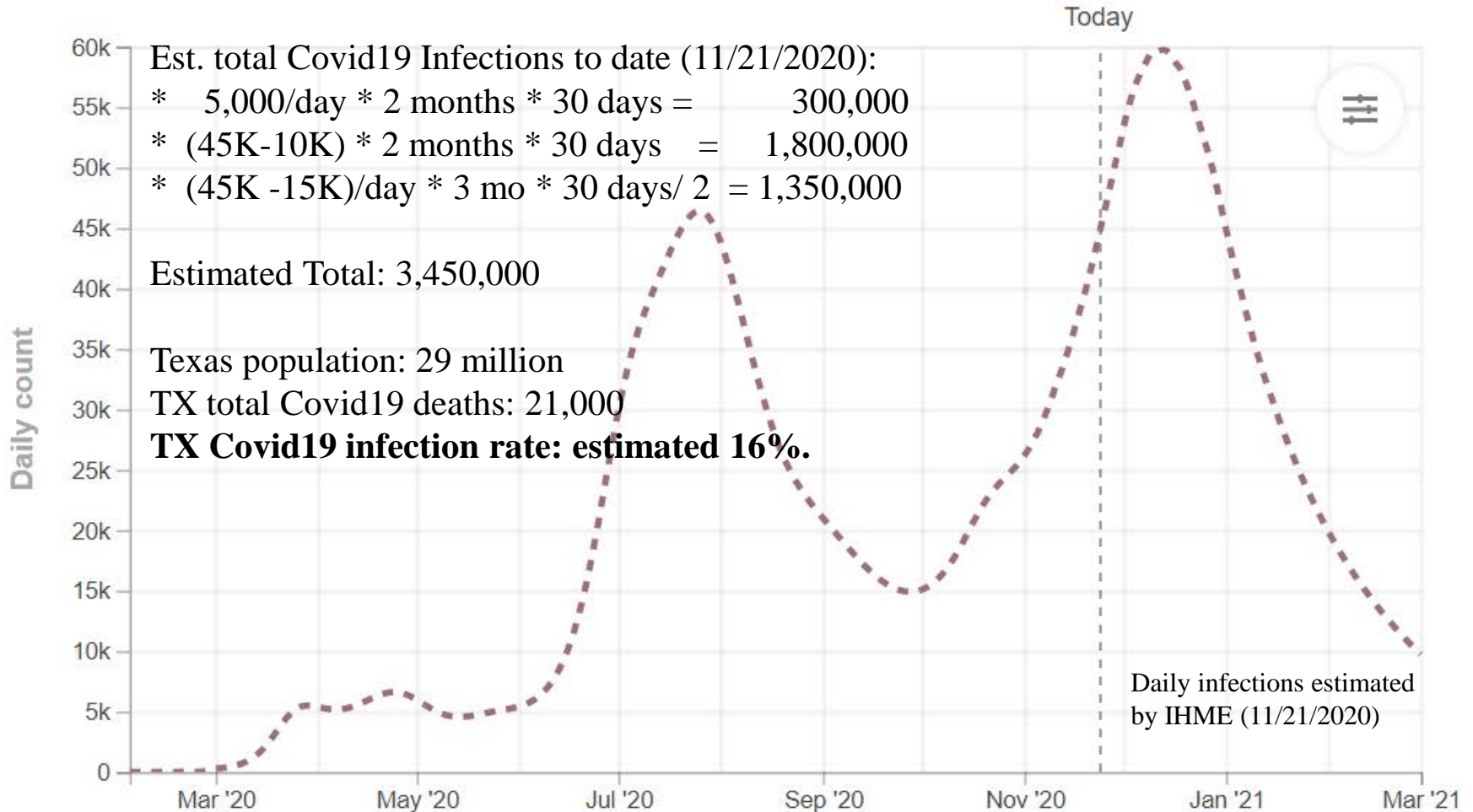
# N. Dakota Covid19 Infections: Daily. Estimate of Total-to-date



# California Covid19 Infections: Daily. Estimate of Total-to-date

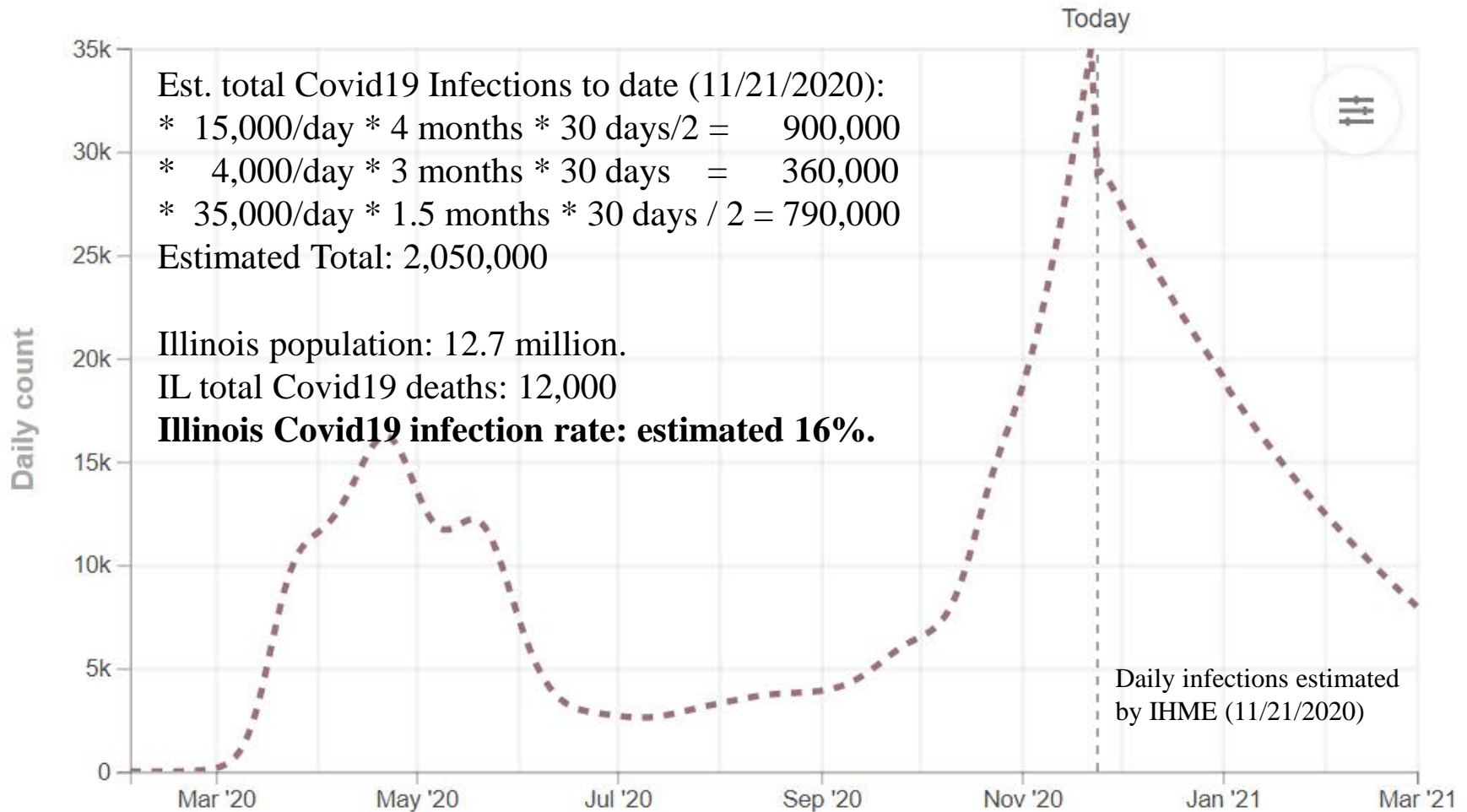


# Texas Covid19 Infections: Daily. Estimate of Total-to-date

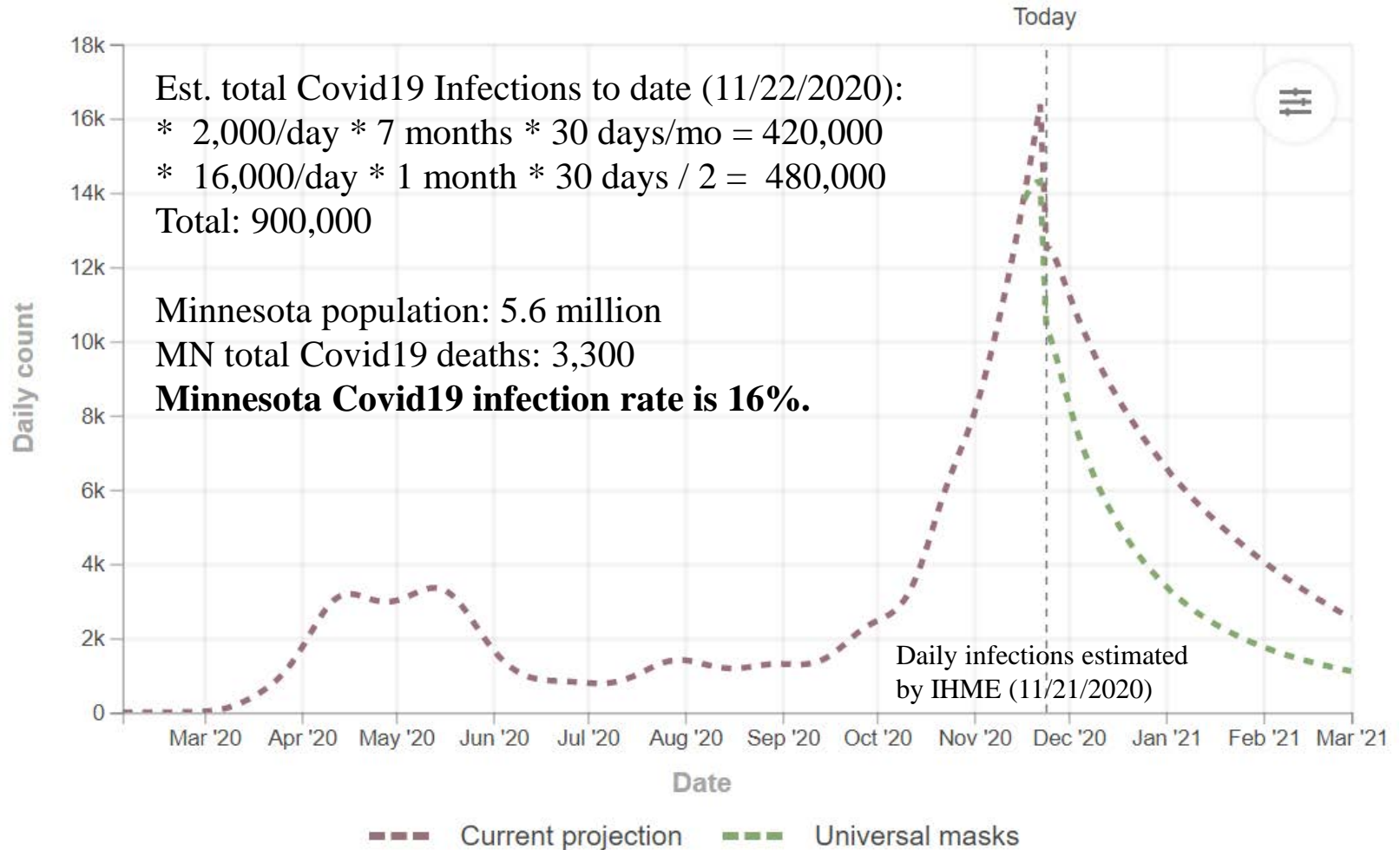




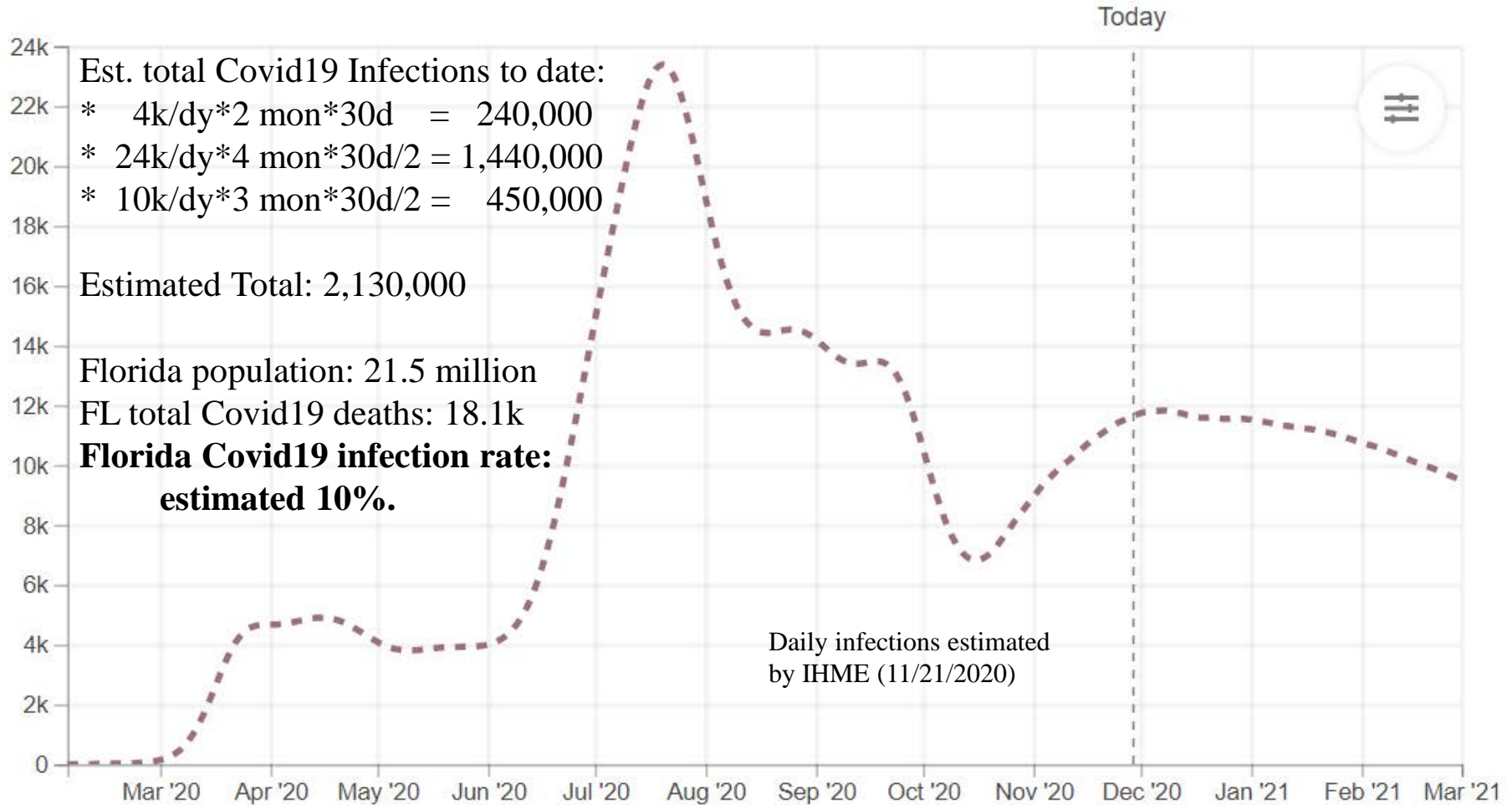
# Illinois Covid19 Infections: Daily. Estimate of Total-to-date



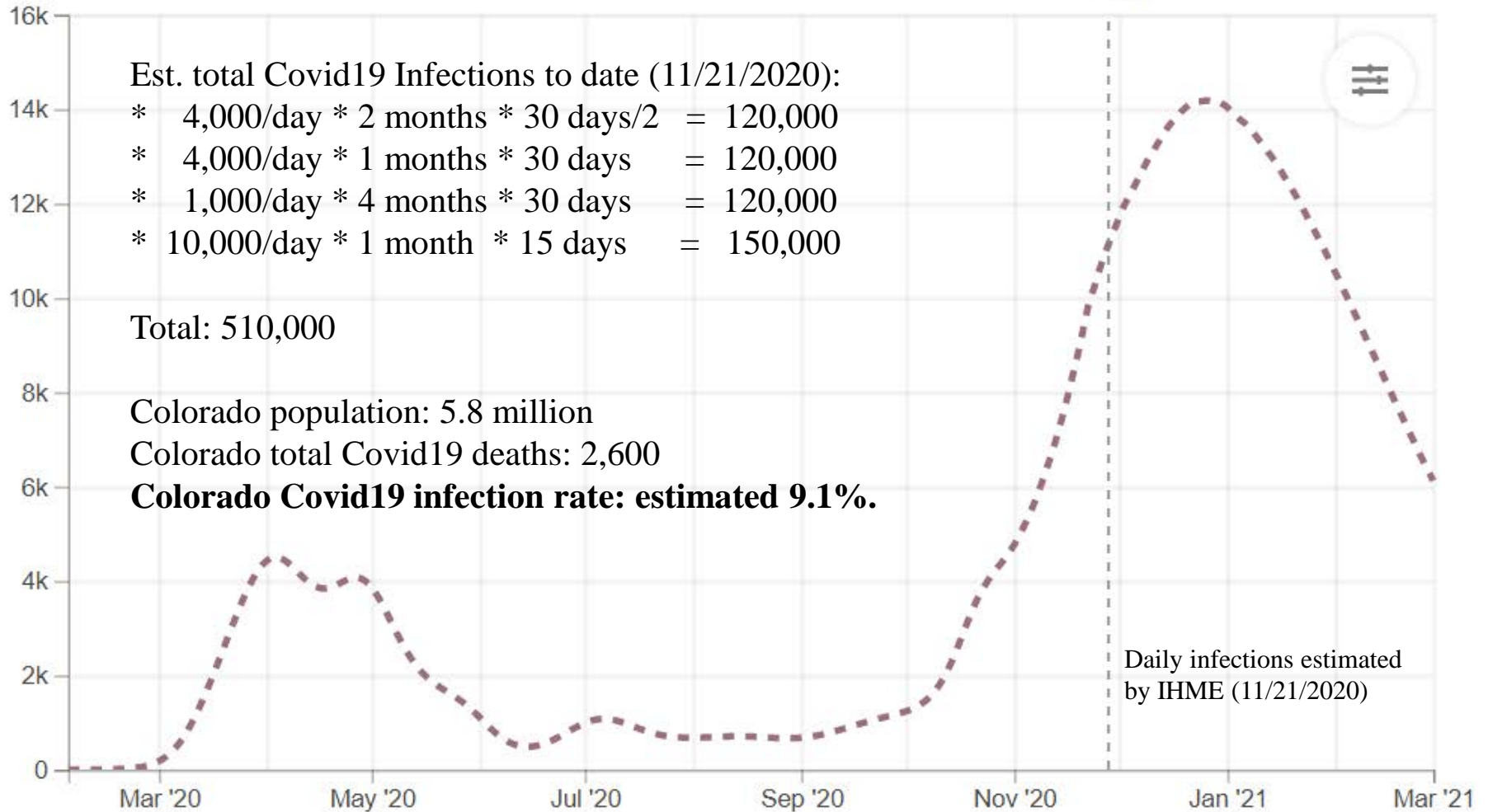
# Minnesota Covid19 Infections: Past: Daily and Total



# Florida Covid19 Infections: Daily. Estimate of Total-to-date



# Colorado Covid19 Infections: Past: Daily and Total



V5 Schield 2020 Covid19 Infections Slides 1121 1

## Covid19 US: Infections, Cases & Deaths

by  
**Milo Schield**  
ASA Fellow  
President: National Numeracy Network

*Nov 21, 2020*

*www.StatLit.org/pdf/  
2020-Schild-Covid19-Infections-Slides-1121.pdf*

V5 Schield 2020 Covid19 Infections Slides 1121 2

### Goal and Approach:

**#1: Estimate total infection rate: # per 100 persons**  
How close is the US is to herd immunity?

**#2: What did US know about co-morbidities?**  
When was this first known?

**#3: Compare two rates:**

- the US daily death rate per 100 cases with
- the US daily death rate per 100 infections.

**How did #2 and #3 influence social policy?**

V5 Schield 2020 Covid19 Infections Slides 1121 3

### Infections vs. Cases

**Covid19:**  
**Infections\***(modelled): Have or had Covid: tested or not  
**Cases** (counted): Test positive for Covid.

**Flu Illness (modelled\*\*):**  
Since most people never tested for flu (or tests did not exist), flu illness is modelled just like Covid infections.

So Covid infections and flu illnesses are both estimated!

\* Daily infections are estimated by HealthData (IHME)  
<https://covid19.healthdata.org/united-states-of-america>

\*\* [www.cdc.gov/flu/about/burden/2019-2020.htm](http://www.cdc.gov/flu/about/burden/2019-2020.htm)

V5 Schield 2020 Covid19 Infections Slides 1121 4

### #1: What is the US total infection rate per 100 person?

Background: The IHME\* estimates the number of daily infections for the United States.

Unfortunately, the IHME does not total the daily number of infections and does not provide the daily number in a downloadable file.

Approach: either enter all the daily infections and total, or estimate the total. These slides do the latter.

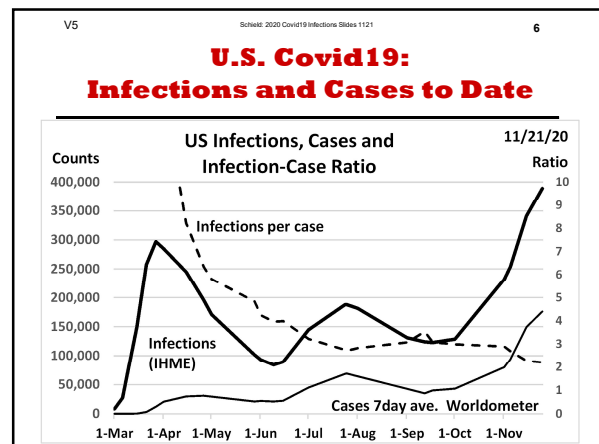
\* <https://covid19.healthdata.org/united-states-of-america>

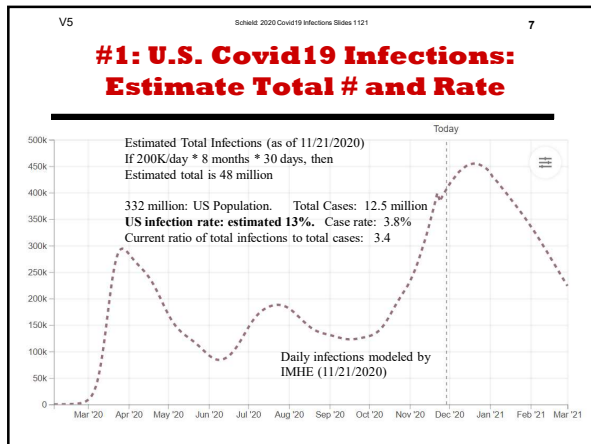
V5 Schield 2020 Covid19 Infections Slides 1121 5

### #1: # Infections vs. # Cases

Date	Infections*	Cases7D**	Ratio
15-Mar-20	149,685	358	418
1-Apr-20	284,757	20,772	14
15-Apr-20	244,944	29,786	8.2
1-May-20	170,866	29,400	5.8
1-Jun-20	92,970	21,874	4.3
1-Jul-20	144,761	44,788	3.2
1-Nov-20	231,651	79,679	2.9
15-Nov-20	340,923	149,246	2.3
25-Nov-20	389,340	176,269	2.2

\* IHME      \*\* Worldometers.Info/Coronavirus





V5 Schield 2020 Covid19 Infections Slides 1121 8

### #2: Co-morbidities Released by WHO on 2/20/2020

Death Rate	Confirmed	All
80+	21.9%	14.8%
70-79		8.0%
60-69		3.6%
50-59		1.3%
40-49		0.4%
10-39		0.2%
0-9		None

Covid-19: China data 2/2020

Death Rate	Confirmed	All
Male	4.7%	2.8%
Female	2.8%	1.7%
All	3.8%	

Covid-19: China data 2/2020

PRE-EXISTING	Confirmed	All
Heart	13.2%	10.5%
Diabetes	9.2%	7.3%
Lung	8.0%	6.3%
Hypertension	8.4%	6.0%
Cancer	7.6%	5.6%
no pre-existing	1.4%	0.9%

Covid-19 Death Rates: China data 2/2020

Death rates / 100 cases.  
 CDC knew all of this before March, 2020.

See Schield (2020): [www.statlit.org/pdf/2020-Schield-Covid19-Analysis-Slides-0308.pdf](http://www.statlit.org/pdf/2020-Schield-Covid19-Analysis-Slides-0308.pdf)

V5 Schield 2020 Covid19 Infections Slides 1121 9

### #2: Untangling Age and Health Problems

By June 15, 2020, the CDC knew this:

Death rate / 100 cases among those with health problems:  
 In their 80s: 50%!  
 In their 70s: 32%!

No health problems:  
 In their 30s: 0.1%

Age	Death Rate of Cases		Health Problems*	
	ALL (5/31)	Some	None	None
5	0.1%	0.6%	0.1%	0.1%
15	0.1%	0.8%	0.1%	0.1%
25	0.1%	1.4%	0.1%	0.1%
35	0.4%	2.8%	0.1%	0.1%
45	2.4%	4.5%	0.4%	0.4%
55	2.4%	7.8%	0.9%	0.9%
65	6.7%	16.7%	2.4%	2.4%
75	16.6%	31.7%	10.2%	10.2%
85	28.7%	49.7%	29.8%**	29.8%**

Table 3: [www.cdc.gov/mmwr/volumes/69/wr/mm6924e2.htm](http://www.cdc.gov/mmwr/volumes/69/wr/mm6924e2.htm)  
 \* Half of the deaths lack health condition status  
 \*\* Missing data explains impossible result

V5 Schield 2020 Covid19 Infections Slides 1121 10

### #3: Death rates per 100 Cases vs. 100 Infections

Date	Infections*	Cases7**	Deaths7	Deaths7 per 100		
				Infections	Cases7	Ratio
3/15	149,685	358				
4/01	284,757	20,772				
4/15	244,944	29,786	1,960	0.8%	6.6%	8.2
5/01	170,866	29,400	1,938	1.1%	6.6%	5.8
6/01	92,970	21,874	1,018	1.1%	4.7%	4.3
7/01	144,761	44,788	556	0.4%	1.2%	3.2
11/01	231,651	79,679	855	0.4%	1.1%	2.9
11/15	340,923	149,246	1,127	0.3%	0.8%	2.3
11/25	389,340	176,269	1,693	0.4%	1.0%	2.2

\* IHME \*\* Averages (7 day) Worldometers.Info/Coronavirus

V5 Schield 2020 Covid19 Infections Slides 1121 11

### Conclusion #1

#1: US total infection rate (11/21) is ~13%.  
 The US is a long way from herd immunity.

#2: March 1: old age and health problems known as leading co-morbidities. June 15: case' death rate for healthy 0 - 40 known as 0.1% versus 30% for 70s with health problems (50% for 80s).

#3: The Covid death rate per 100 infections:  
 • Peaked at 1.1% in May (currently 0.4%).  
 • Half the death rate per 100 cases

V5 Schield 2020 Covid19 Infections Slides 1121 12

### Covid19: Two Major Mistakes

Covid decision-making was sabotaged by focusing on:

1. deaths *per case* instead of deaths *per infection*.
2. The death rate *overall* instead of the rates for **the unhealthy old versus the healthy young**.

#1 made Covid much more deadly than it really was.  
 #2 put everyone at risk instead of just the vulnerable.

These two mistakes (and the need to "smooth the curve"):  
 3. were the basis for ordering a national shut down: the biggest uncontrolled quasi-experiment in history.

