Social and Natural Factors in the COVID-19 Pandemic:

Social Learning, Political Leadership and Population Concentration

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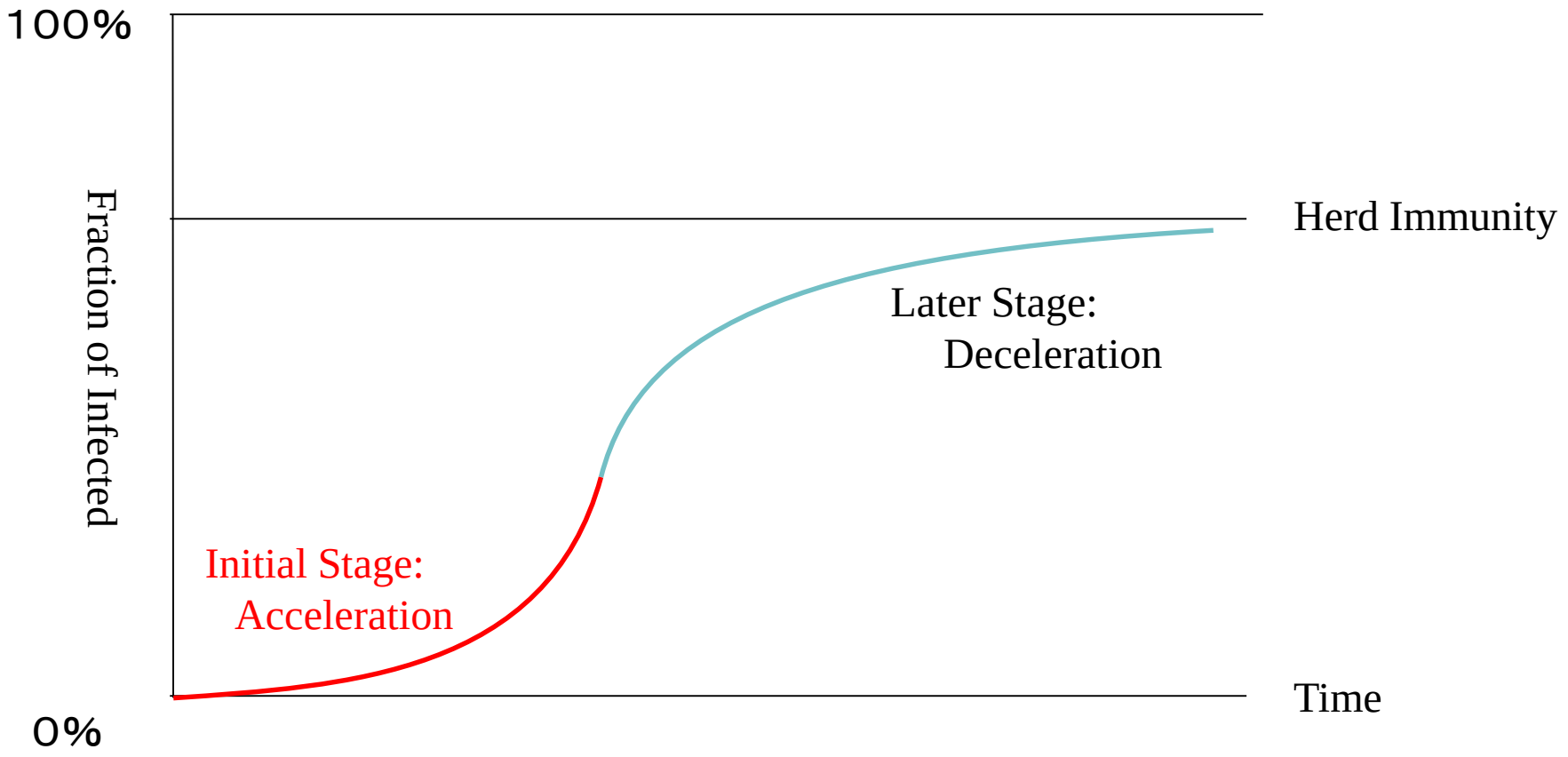
My Observations on the Early Stage of the COVID-19 Pandemic

1. Both natural and social factors are at work in the spead of the virus.
2. The importance of social factors was under appreciated.
3. Social Factors:
   - The influence of political leaders is large during a crisis.
   - Too much information manipulation and unfounded claims were made at an early stage.
   - People's rationality on social learning and self-protection were under appreciated.

- In the Japanese case,
  - Too many discussions were not based on evidence but on hearsay.
  - Information flows from abroad were insufficient.

Natural Factor (Epidemiologic)



Misinformation from Political Leaders

In the U.S., many political and medical leaders downplayed the potential danger of the virus at the very early stage.

The coronavirus would weaken “when we get into April, in the warmer weather—that has a very negative effect on that, and that type of a virus.” February 7 and 19

The outbreak would be temporary: “It’s going to disappear. One day it’s like a miracle—it will disappear.” February 27

Pharmaceutical companies are going “to have vaccines, I think, relatively soon.” March 2

The coronavirus is “going to go away without a vaccine … and we’re not going to see it again, hopefully, after a period of time.” May 8

Misinformation from the Medical Profession

Washington Post
July 29

"The mask is the simplest and among the most effective weapons against the coronavirus in the public health."

Dr. Jorome Adams,
the surgeon general of the U.S.

tweeted "Seriously people, STOP BUYING MASKS" (Feb 29).

Dr. Anthony Fauci,
the director of the National Institute of Allergy and Infectious Diseases since 1984,

told "there is no reason" for anyone to wear a mask (March 19).

This was reversed on April 3, but some people had, since, circulated wrong messages on Facebook pages etc.

My Views

Early misinformation can have a long-lasting negative impact.

This is perhaps because the influence of political leaders is large, and long lasting, at an early stage of a serious crisis.

Through social learning, people make self-protective efforts against a crisis, but that is not sufficiently effective if the crisis is too large and if the efforts are undermined by the initial misinformation.

These are my views even before this pandemic, expressed in my work.

Honryo and Yano, Idiosyncratic Information and Vague Communition, American Political Science Review, Forthcoming

But, what is evidence for these claims?

My Research on an Early Stage of the Pandemic

Yano (2020). “COVID-19 and Politics: The Cases of Florida and Ohio.”

The paper investigates the determinants of
the COVID-19 spread at an early stage.

Findings

People did learn and make self-protective efforts against the pandemic.

The natural factor and the influence of political leaders are so severe that private self-protection efforts could be wiped out.

Method

I study the determinants of the early Florida outbreak.

Possible Determinants

Determinants	Proxies
Epidemiologic Factors	Population Population Density Urbanization
Political Factors	Number of Core Supporters for President Trump
Economic Factors	Poverty, Income
Education	Education Level

Why Florida?

1. A relatively large number of people were infected.

State	Total Cases	Total Deaths	Population
US Total	1,816,820	105,557	328 M
New York	378,951	29,829	19 M
New Jersey	160,916	11,637	9 M
Illinois	118,917	5,330	13 M
California	109,883	4,213	40 M
Massachusetts	96,301	6,768	7 M
Pennsylvania	75,794	5,560	13 M
Texas	63,416	1,679	29 M
Michigan	56,884	5,463	10 M
Florida	55,424	2,447	21 M
Maryland	52,015	2,509	6 M

May 31, 2020

2. It is surrounded by the sea so that it is less likely to be affected by neighbouring states.

3. A governor election was held in 2018, by which I capture the number of core Trump supporters.

Potential Factors

Independent Variable:
the county-wise cases per capita (April 15)

population		+++									
population density			+++								
number of cities				+++							
per capita income					+++						
education level						+++					
housing prices							+++				
wage rate								+++			
area									+++		
number of hospitals										+++	
poverty											+++

＋＋＋（－－－）: 1% significance

＋＋（－－) 5% significance

＋（－） 10% significance

Population as a Dominant Factor

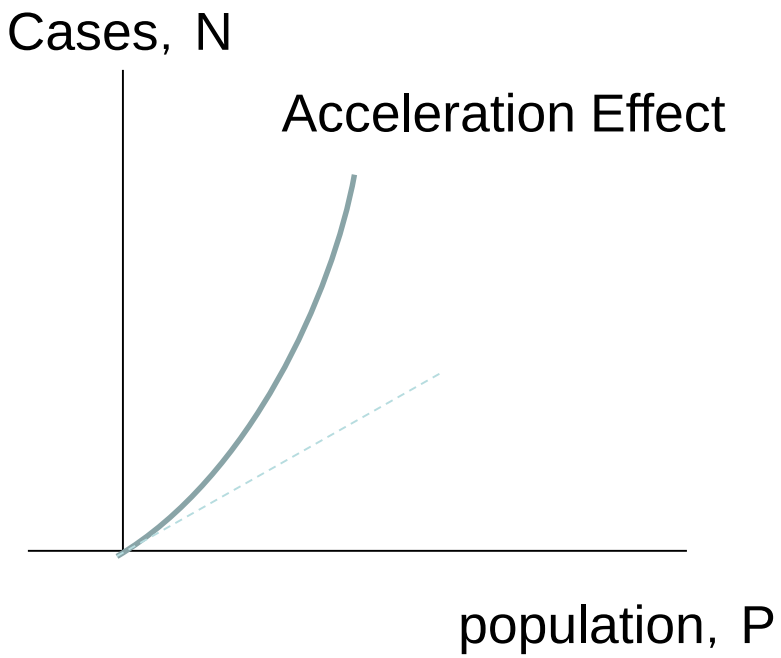
Independent Variable:
county-wise cases per capita (April 15)

population		+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
population density			+++								
number of cities				?							
per capita income					+						
education level						?					
housing prices							+				
wage rate								?			
area									?		
number of hospitals										?	
poverty											?

If population is added as an explanatory variable, the other factors lose explanatory power except for population density.

The larger population, the more the per capital cases

Acceleration Effect of Population



Cases, N Population, P

$$\frac{N}{P} = 41.5\frac{1}{10^5} + 5.8\left(\frac{P}{10^{10}}\right)^1$$

$$N = 41.5\frac{P}{10^5} + 5.8\left(\frac{P}{10^5}\right)^2$$

Population has an acceleration effect on COVID-19 cases.

Size of Core Trump Supporters as a Dominant Factor

Independent Variable:
the county-wise cases per capita (April 15)

Core Trump Supporters R	**+++**

Intensity of Core Trump Supporters

$$R = \frac{\text{Number of Votes for the Republican Candidate (Gov. DeSantis) in the 2018 Gubernatorial Election}}{\text{Number of Votes for the Republican Candidate (Pres. Trump) in the 2016 Presidencial Election}}$$

$$\frac{N}{P} = -0.0037 + \boxed{\frac{4.58}{100000}R}$$

The larger the size of core Trump supporters, the more per capita cases.
（Political Effect）

Size of Core Trump Supporters and Population Density

Independent Variable:
county-wise cases per capita (April 15)

population	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Core Trump Supporters	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
population density		--	--	--	--	--	--	--	--	--
number of cities			?							
per capita income				?						
education level					?					
housing prices						?				
wage rate							?			
area								?		
number of hospitals									?	
poverty										?

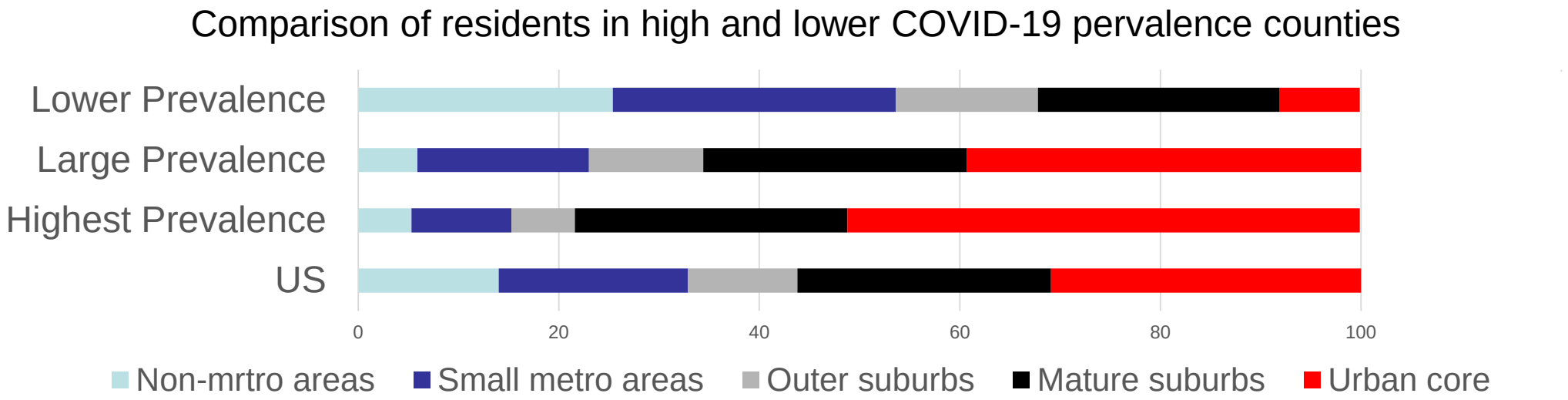
If population and the size of core Trump supporters are added as an explanatory variable, my result shows Population density is a factor slowing the spread of the virus.

Why????

I suspects that this is because people who live in a more crowded area realizes that they are more likely to catch the virus and make more self-protection efforts.

Self Protection Efforts and Urban Population

- In early days, residents of large cities (such as New York) were in more danger.



W. Frey (senior fellow at Brookings) ""Who lives in the places where coronavirus is hitting the hardest" Brookings Metro's COVID-19 Analysis Series, Brookings, April 10, 2020

This might have induced urban residents to behave more carefully, creating the suppressive effect of population density (social learning effect).

If so, it might be that the more urbanization, the fewer per capita cases.

Urbanization and Population

Independent Variable:
the county-wise cases per capita (April 15)

Intensity of Core Trump Supporters R	**+++**
Number of Cities K	**−−**
Population x Number of Cities PxK	**+++**

$$\frac{N}{P} = -0.0037 + \frac{4.58}{100000}R + \frac{2.93}{100000000000}(P - 829352)K$$

In the counties with population smaller than 829,352,
the more urbanization (or the larger number of cities), the more per capita cases.

(Of the 67 Florida counties, only six states have population larger than 800,000.)

In counties with small population, the social learning effect mitigated the spread of the virus. But it was not enough to reduce the per capita cases in the counties with larger population.

Summary

- At the early stage of the COVID-19 pandemic,
  1. The natural (epidemiologic) effect of COVID-19 contributed to the spread of the virus.
  2. The attitudes of political leaders towards the virus contributed to the spread.
  3. The social learning effect might be at work, inducing to people to take a more cautious approach towards the virus, thereby reducing the per capita cases in more densely populated area.
  4. While the social learning effect was strong enough to reduce the per capital cases in areas with small population, it was not sufficient in areas with large population.