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RESEARCH ARTICLE

Coping with the COVID-19 Pandemic in the U.S.

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ABSTRACT

As the COVID-19 pandemic spread from the Far East throughout the world, while the inoculation was unavailable, countries introduced public health emergencies that engaged various non-pharmaceutical interventions (NPI). These restricted economic activity and private life. From the beginning, some countries at the source of the pandemic in the Far East implemented more comprehensive and restrictive NPI than Western countries. The former also experienced lower pandemic casualties.

The United States of America (the U.S.) faced the first wave of the pandemic in April 2020, and by the end of 2021 recorded the largest nominal mortality in the world, ranking in the top 20 countries on the mortality rate per population. The country had pandemic plans in place and a capable healthcare system. This capability-mortality contrast motivated our investigation. The problem of confronting the pandemic has been studied by focusing on singular NPI. We took a more comprehensive approach by relying on a new research instrument labeled Pandemic Containment Strategy Index (PCSI) which covers 10 areas of NPI. Our investigation covered the period from the start of 2020 until May 31, 2021. We used two samples of American states and publicly available data sources, and covered the first pandemic wave (n=26 states) and the post-first wave period (n=9 states).

We found that the U.S. restrictions on freedom of movement and business operations were in the mid-to-high range in the first wave, while the country underperformed in several NPI areas the PCSI addresses. Based on the PCSI classification of containment strategies, America's prevailing strategy was permissive. Central coordination was missing, tensions between medical and government authorities surfaced, and tests and protective equipment were lacking. In the post-first wave period, American states experienced additional and larger waves, while the strategic and operational problems continued. Our study contributes to understanding COVID-19 pandemic in the U.S. and the global context, and it has implications for the future study of the PCSI in particular and NPI in general.

Keywords: COVID-19, United States, pandemic strategy

1. Introduction

As the COVID-19 pandemic spread from the Far East throughout the world, while the inoculation for this variant of SARS was unavailable, public health emergencies were imposed internationally based on various forms of NPI. In mainland China, where the new pathogen SARS-Cov-2 was discovered, as well as in S.A.R. Hong Kong, South Korea, Singapore, and Taiwan, strategic plans developed

after the 2002-04 SARS epidemic tracked public health strategies for combating COVID-19.^{1, 2} NPI materialized in significant behavioral and business restrictions.^{3, 4} Western countries exhibited less sensitivity to both the risk level and proactive strategizing.^{5, 6} Figure 1 depicts mortality figures during the pandemic in the Far East and the West, indicating significant differences in favor of the former hemisphere.

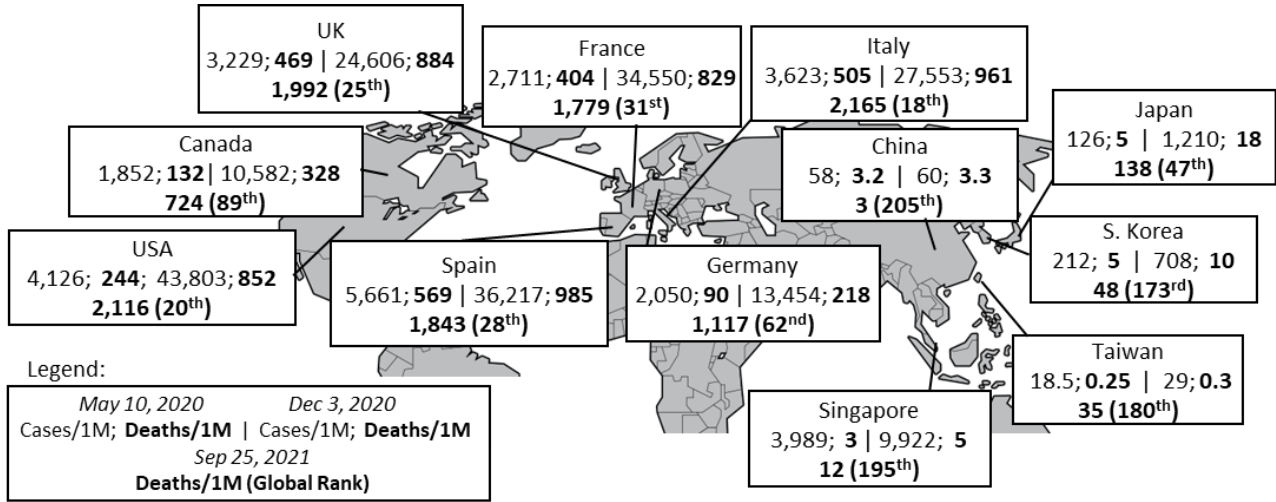


Figure 1. The Far East-West Divide in COVID-19 Mortality (Sources: Dashboards of Johns Hopkins University and Worldometers)

The East-West pandemic divide is apparent in different orders of magnitude of case and mortality figures. The 2020 mortality rates in particular were in the single and low double digits in Far Eastern countries. In contrast, Western countries had mortality rates in the low to high triple digits. The gap continued in the second year of the pandemic as indicated in the global rank on mortality rate (the higher, the better; 224 countries ranked). The Far East was in the uppermost quartile (with the exception of Japan), while the West was in the lowermost quartile (with the exception of Canada and Germany).

The United States (U.S.) has its share in the East-West pandemic divide. The first incidents of COVID-19 in the country were registered in late January in patients who returned from Wuhan, China to the West Coast and Mid-West.⁷ The first

mortality followed soon thereafter, and the community spread of infection unfolded. A national public health emergency was declared on March 11, 2020. Hundreds of thousands of Americans who returned from China and Europe via the international airport in New York brought a massive influx of the pathogen.⁸ By mid-April, states on the North-East coast became the epicenter of the pandemic. By the end of 2021, 846,000 Americans had died from COVID-19. Globally, this was the largest nominal loss and 15% of the world's mortality. The U.S. mortality rate was the twentieth in the world and the first among the G7 countries.⁹ These pandemic figures stand in contrast to capabilities of the U.S. The country had strategic planning for influenza epidemics in place.¹⁰ It also had a capable health system which recently ranked in the top third among 89 countries?¹¹ This

capability-mortality contrast motivated our investigation. Our main objective was to answer the question: What strategic approach to containing COVID-19 based on NPI was deployed in the U.S.? The problem of confronting this respiratory pandemic has been studied by focusing on a limited number of NPI, such as physical distancing, using face masks, eye protection, social distancing, school and workplace closures, and travel limitations.^{12, 13} Comprehensive NPI studies are still rare.¹⁴ In order to contribute to filling this literature gap, we took a more comprehensive approach by relying on a new research instrument labeled Pandemic Containment Strategy Index (PCSI) which covers several areas of NPI.¹⁵ Our investigation covered the period from the beginning of 2020 until May 31, 2021, when NPI were significantly reduced or canceled in the U.S.

2. Theoretical Background: Three Strategies Framework

The PCSI helps differentiate between three strategies that emerged internationally: *Restrictive*, *Hybrid*, and *Permissive*.¹⁵ The respective examples of these strategies are China, South Korea, and most Western countries at the beginning of the pandemic. The *Restrictive Strategy* declares a state of national emergency with policies that resemble a state of war, given the level of restrictions on citizens and businesses and the deployment of the police and possibly military in enforcing new policies. Authorities use various methods of early detection and execute high-tech-based contact tracing to control and contain the outbreak. Quarantining is enforced from the city level down to residential buildings. The *Restrictive Strategy* was also deployed in Indochina, central Asia, Africa, parts of Latin America, and some European countries.¹⁵

The *Permissive Strategy* is typical of the West. It introduces fewer restrictions based upon a more flexible legal framework that relies more on advice than order. Pandemic policies change with the evolving situation on the ground. Thus, Social Distancing rules vary over time (the number of people allowed together, locations, occasions),

borders are closed and opened, traffic is reduced and then increased, business hours and occupancy limits vary in customer-facing businesses, facial coverings are required/not required/enforced selectively, etc. In accordance with the constitutional and cultural background, behavioral controls are low-tech and milder than with the *Restrictive Strategy*. However, the *Permissive Strategy* morphs into the *Restrictive Strategy* when the caseload and fatalities exceed a national health system's capability (e.g., Italy, Spain, France).

The *Hybrid Strategy* is associated with South Korea, Singapore, Taiwan, and Japan in part. It imposes certain restrictions, yet strives to preserve freedoms where possible. High-tech infection tracking and contact tracing, as well as quarantining of incidents are mandated, but a more liberal approach is applied in regulating social life, business, and education. This strategy resembles triaging the population to identify and treat those who are ill, while allowing others to carry on a normal life with minimal restrictions. This fine balance of freedoms and limitations complicates the management of this strategy. Further, it requires a cooperative citizenry with a sense of social responsibility. A transition into alternatives may occur (after the first wave, Singapore moved toward the *Restrictive Strategy*, while Japan shifted toward the *Permissive Strategy*).

In comparison, the *Restrictive Strategy* is proactive and effective in containing the pandemic, but stated bluntly, is oppressive; the *Permissive Strategy* reacts to the pandemic flow and thus, is less effective, but it is less oppressive, while the *Hybrid Strategy* detects incidences proactively, and so is effective, but it requires careful management and an helpful cultural context that balances individual and community interests. With respect to restrictions, these strategies embrace different dictums—“absolutely needed” (*Restrictive*) vs. “if needed” (*Permissive*) vs. “where needed” (*Hybrid Strategy*). These strategies bear similarities with strategic goals of elimination vs. containment vs. mitigation, which are discussed in the literature.¹

3. Methods

The PCSI served as the key research instrument in

this study. Its dimensions are in Table 1. The PCSI is similar to the government stringency index developed at the University of Oxford,¹⁶ but it was developed independently. The PCSI resulted from empirical evidence of NPI used to combat COVID-19 internationally.

The PCSI focuses on four areas: Policies' enforcement (aggregate dimensions 1-3 in Table 1), the regulation of citizens' movement (4-6), regulation of business (7), and policy support for medical practices (8-10). The aggregate dimensions involve several items that are rated on 0-2 or 1-3 scales. Some dimensions are weighted higher given their influence on NPI effectiveness (e.g., Social Distancing, Lockdown, two enforcement

dimensions). The index range is 1-33 that allows for three value ranges to be defined: low (1-11); middle (12-22), and high (23-33).

The numerical logic behind the PCSI emerged from observing developments in the Far Eastern countries, which first faced and confronted the disease via higher restrictions, and then comparing this with other countries as the epidemics spread westward. Consequently, the PCSI value ranges have an empirical origin rather than merely mathematical one. In contrast to Oxford University's government stringency index, the PCIS covers eight of their nine items, plus 16 more; the items' aggregation also differs.

Table 1. Dimensions of the Pandemic Containment Strategy Index

No.	Dimension	Description
1	<i>Declaring Special Regime</i> (2 items)	Invoking special legislation in extraordinary circumstances designed to mobilize social forces and resources
2	<i>Police/Military Enforcement</i> (2 items)	Official deployment of police and military to control COVID-19 situation
3	<i>Technology Enforcement</i> (1 item)	Deploying modern digital technologies to monitor citizens' behavior during the pandemic
4	<i>Border Closings</i> (2 items)	Banning foreigners from entering a country
5	<i>Social Distancing</i> (5 items)	A government's advice or lawful orders to maintain a physical distance from other people
6	<i>Lockdown</i> (5 items)	Legislation to limit freedom of citizens' movement
7	<i>Business Limitations</i> (4 items)	A government's decision to limit business hours or close businesses
8	<i>Early Detection</i> (4 items)	Government-regulated tracking of infection paths, including checkups to identify infection symptoms
9	<i>Contact Tracing</i> (1 measure)	Identifying individuals who were in contact with infected persons
10	<i>Other Measures</i> (open-ended)	Introducing additional protective measures when in public, such as face coverings

The PCSI was used to assess the way a sample of 26 states in the U.S. performed across 10 dimensions of NPI in the first wave of the pandemic from April 15, 2020-May 31, 2020. Ratings of items belonging to dimensions is based on a key that provides probes and examples on 3-point

scales (all 0-2 points except one with 1-3 points). The rating was performed by three raters; re-rating ensued in the case of significant discrepancies and ran until a near 100% agreement was reached. For investigating the post-first wave of the COVID-19 pandemic in the U.S., the PCSI was used to study

nine states representing different parts of the U.S. during the period June 1, 2020-May 31, 2021.

Publicly available data sources were used, such as state government documents, public dashboards, and certain reputable mass media. The government documentation consisted of state governors' orders (the largest segment), chief medical officers' orders, and rare police orders. This documentation was analyzed in order to assess the extent of PCSI dimensions. In some cases particular NPI (e.g., bars openings/closings) were very detailed, proportioning access to facilities in precise capacity percentages. In other cases, there were simpler go/no-go orders. This determined the ratings that were either fractioned or set to zero or higher numbers, respectively.

Reports on the pandemic developments by credible print media were used in the absence of the relevant coverage in academic publications. Finally, observing televised appearances of several chief decision makers concerned with NPI completed the data collection methods. Data analysis involved document analysis and exploratory statistical analysis.

4. Results

4.1 Pandemic Onset

The first study period captured the first pandemic wave. Patient zero in the U.S. was a man who returned to Washington state from Wuhan, China and was confirmed positive for COVID-19 on January 20, 2020.⁷ Similar cases followed soon after in California and Illinois. The first incident of community spread was confirmed in Illinois on January 30,¹⁷ while another inroad for SARS-CoV-2 was on the East Coast. Hundreds of thousands of Americans returned home from China and Europe before the national border was closed, and the screening at points of entry was insufficient.^{8, 18}

The first COVID-19 death in the country was recorded in California on February 6.¹⁷ Washington state followed suit in the same month (early reporting placed the first fatality in this state). A national health emergency was proclaimed on March 13, 2020. Although this step followed the WHO declaration of the COVID-19 pandemic

issued two days earlier closely, it lagged six weeks behind the WHO's declaration of Public Health Emergency of International Concern (PHEIC) issued on January 30. Further, the federal intervention lagged behind emergency declarations at the state level (Washington, California, Maryland) and some counties. Soon after, all states in the U.S. declared their emergency regimes.

In the first three weeks of March, all other states in our sample recorded fatalities. The pandemic peaked in April in the North-Eastern states, thus indicating its first wave. Contagion clusters emerged at business conferences, meatpacking plants, farms, parties, places of worship, funerals, long-term care facilities, detention institutions, and military facilities. A professional conference in Boston and funerals in a small town in Georgia represent examples of super-spreader events.

Clear public communication, planning, and coordination were absent at the federal level, which used to drive containment strategy in previous epidemics. As federal powers were not inclined to provide a centralized response to the pandemic, a patchwork response emerged at the state and municipal levels.^{19, 20} The extent of pandemic policies varied across states and sometimes between counties in a state. Tensions between the health and government authorities emerged and filled the mass media coverage. An example of the government's lack of intervention was South Dakota, where decisions about physical distancing and business closures were left entirely to citizens and business people's discretion.²¹ Similarly, there was a weaker state government's response in Texas, leaving the management of restrictions to federal authorities and pushing continually toward opening moves.²² The first wave of the pandemic was also marked by shortages of personal protective equipment, hospital beds in regular and intensive care units, ICU equipment, and testing supplies. Testing began slowly and initially misfired due to expired testing material in federal reserves.

By contrast, advances were made in increasing the hospitalization capacity by involving military resources, the domestic supply of ICU ventilators increased, and COVID-19 testing increased

significantly in the states sampled during the observation period (although the numbers of PCR tests and antibody tests were indistinguishable). Moreover, scientists made advances in understanding the new pathogen as they worked to develop vaccines.

4.2 High Social Distancing, and Low Lockdown and Border Closings

Public health emergencies regulated the free movement of citizens captured in three aggregate dimensions of the PCSI. Social Distancing is a prominent such dimension comprised of five items: the stay-at-home regulations; school closures; cancelation of mass events; a work from home regulations, and limiting access to long-term care facilities.

The sample’s mean \bar{x} for Social Distancing is 3.08 (the maximum is 4) which places this score in the fourth quartile; this is interpreted as “high” (Table 2). However, the state scores range from 1.60

(Arkansas) to 4 (the maximum found in New York, California, and Michigan). Arkansas never introduced any stay-at-home policy and scored lower on other items as well; the same applies to South Dakota, which had the second lowest Social Distancing score of 2.0.

School closures at various levels began unevenly in the states sampled but then they all synchronized with total closure. The same applies to mass events in sport, entertainment, and the arts. State governments advised businesses consistently to switch to working from home (telecommuting) wherever possible.

Access to long-term care facilities (nursing homes, assisted living) was divided roughly between partial and total. However, it was addressed rarely in early executive orders and prompt reporting of mortality in these facilities was absent. These facilities were hit hard from the pandemic’s start and represented between 35%-40% of all mortalities in the country.^{23, 24}

Table 2. Sample means for PCSI aggregate dimensions

State	Mean/Max	Quartile	Extent
Special Regime	2.07/3	2.0	Moderate
Police/Military	0.5/4	-	Very Low
Technology Enforcement	0.34/6	-	Very Low
Border Closings	0.19/2	-	Very Low
Social Distancing	3.08/4	3.6	High
Lockdown	0.92/4	-	Very Low
Business Limitations	1.36	1.1	Low
Early Detection	0.42/4	-	Very Low
Contact Tracing	-	-	Very Low
Other Measures (Masks)	0/2	-	nil

The PCSI aggregate dimension of *Lockdown* should not be confused with the notion of restrictions overall. Its key goal is to capture the extra control over free movement via quarantining, traffic limitations within a state, and curfew deployment. The mean Lockdown across the states is below 1 (of

a maximum 4), which translates into a very low extent (Table 2). Interstate traffic was not shut down and the authorities limited their role to advising the reduction in non-essential travel with rare examples of checkpoint control (Florida). Further, the curfew deployment was rare within counties or cities (New

Jersey, Massachusetts, Mississippi, Louisiana, and Arizona).²⁵

Border Closings is another aggregate dimension on which the states investigated scored very low (Table 2). International airports were controlled for passengers from certain countries, while the commercial land traffic with Canada and Mexico operated normally. Interstate traffic was not obstructed (except by Florida) and the authorities relied on advising against non-essential (business unrelated) travel. There were varying limitations on intra-city traffic in metropolitan areas.

4.3 Mid to High Business Limitations

A division between essential vs. non-essential business categories was defined clearly in governors’ orders from the beginning and updated occasionally. The essential category consisted of manufacturing (with some variation), food processing, commercial transport, civil construction, agriculture, and banking. These industries maintained the economy as usual with face-to-face work and applications of protective/hygienic measures. In parallel, most of office work turned to telecommuting. The non-essential category of economy included retail of non-consumables, personal services, restaurants, bars, and show business/entertainment/sports. Some states in our sample advised selective closures within this category, while others made them mandatory. Overall, we found that 13 states were in the first group and 12 in the second. Restrictions were tighter on the North-East and the West Coast than in the Southern states.

Figure 2 displays the distribution of states’ means of Business Limitations across quartiles, which resembles an inverted pyramid. Most of the states are in quartiles 3 and 4 – 38.5% and 34.6%, respectively. The mean of Business Limitations is 1.36 of 2 (Table 2) which falls into the mid-range (a zero score for South Dakota influences the mean). It follows that business limitations in the economy’s non-essential sector were in the mid-to-high range. This reflected on the public in restrictions on shopping, personal services, and eating and drinking out. In some states, the governors’ orders

addressed the capacity of restaurants, bars, shops, gyms, hair/nail/tattoo parlors, and like establishments frequently and in great detail.

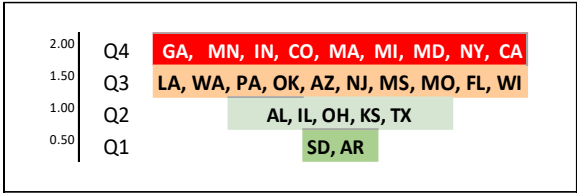


Figure 2. Business Limitations per state

4.4 Low Early Detection, Contact Tracing, and Enforcement

American states scored lower on the dimensions of Early Detection and Contact Tracing, as well as the dimensions of Technology Enforcement and Police/Military Deployment. Early Detection entails tracking the pandemic’s spread and identifying its carriers. Half of the states sampled made attempts to detect infections early by using some sort of questionnaire at passenger check points. No biological checks were employed.

Contact Tracing was performed unevenly across the states during the first wave and used only traditional, manual methods. The number of tracers varied from single digit-numbers to hundreds (e.g., Michigan). Still, we could not find precise numbers for each state and, therefore, we decided to rate this dimension as zero for the entire sample. One study confirms that Contact Tracing was insufficient, as only 1/3 of patients traced could be reached for interviews and to name their contacts.²⁷ High-tech-based Contact Tracing was not used during March and April when public discourse consisted of deliberations concerning Contact Tracing’s impacts on individuals’ privacy.

Finally, the PCSI rubric of Other Protections was nil. We examined the use of facial coverings specifically. During the first wave, only medical staff used this protection. Notably, this was consistent with the advice of the CDC that complied with the WHO advice.²⁶

The enforcement aspect influences the implementation of NPI discussed thus far. The PCSI dimension of Declaring Special Regime reflects the

legal framework with respect to legislation type and forcefulness. Typically, the states investigated introduced health emergency regimes and relied on a combination of advice and mandates, as reflected in the moderate mean value ($\bar{x}=2.07$ of the maximum 3).

The police were deployed rarely in the U.S. to perform tasks that deviated from the regular maintenance of public order ($\bar{x}=0.5$ of 4). When they were, their role was restricted to monitoring compliance with business closures and mass gatherings. The mass media reported a disproportion between the number of calls and police citations/fines. As for the military involvement, the National Guard helped civilian authorities in the medical area without intervening in maintaining public order, except in Florida, which controlled state borders for travelers from certain departure points.²⁵

Enforcing desired behaviors through digital information technologies (unrelated to Contact Tracing) was nearly uniformly nil ($\bar{x}=0.34$ of 6). Sporadic examples include the use of drones in New Jersey for warning purposes, and the Kansas Department of Health's use of an Internet-based dashboard to track cellphones' location anonymously (the dashboard covered the entire U.S.). Government-driven websites and dashboards for informing purposes were maintained in all of the states studied.

4.5 Post First Wave

We extended the investigation into the subsequent period from June 1, 2020-May 31, 2021, based on a smaller, purposive sample of nine states drawn from the sample used in the first part of the study. The sample represented various state sizes and geographic zones adequately and was comprised of New York, New Jersey, Florida, Texas, California, Arizona, Wisconsin, Alabama, and South Dakota. These states experienced 1-3 additional mortality peaks throughout 2020. Some peaks coincided in time across states, and their magnitude exhibited an upward trend.

Advances in Contact Tracing took place in several states, although quite late into the pandemic. This

included the deployment of mobile telephone-based systems based upon the Apple-Google framework. Face coverings was an additional measure some state governments (e.g., New York and Arizona) embraced, while others ignored or rejected it (e.g., Texas, South Dakota).

State legislations evolved and varied in scope and fundamental assumptions. Within the sample studied, "New York Forward Reopening Guide" stands out with respect to the comprehensiveness and clarity of decision rules for a staged opening of counties and cities.²⁹ California formalized its opening roadmap in "Blueprint for a Safer Economy," which defined four restrictions tiers pegged to a current caseload. Authorities in Florida developed a three-phase opening approach via a set of government decisions. In other states, much of regulatory efforts focused on services with close customer contact, as during the first wave. PCSI values fluctuated more frequently in Alabama, Texas, and Arizona than in other states sampled. In New York and Wisconsin, the PCSI trend was up, which meant that NPI tightened. In California the PCSI went down once and then bounced back up. In other states there was a downtrend in PCSI values, implying a relaxation of NPI.

Central coordination problems continued from the first wave period. The leadership over the pandemic was formally in hands of the American Vice-President with the country's President being de facto in charge. As evidenced in media reporting and daily televised press releases of the federal pandemic task force, medical authorities appeared marginalized and silenced when exposed to scientifically unsound statements and decisions. Being self-declared as a defender of civil liberties, right-wing media regularly criticized some of American top epidemiologists.

5. Discussion

We explored the COVID-19 pandemic in the U.S. from its beginning in 2020 until the end of May 2021. The study was limited by the character and timing of the evidence, and the data sources available. Since it contains 25 items grouped into 10 aggregate dimensions, the PCSI requires well-

maintained e-government sources. The American states studied provided these at a satisfactory level overall, although some did so much better than others. However, county level documentation was missing, which would have been helpful to obtain a deeper insight into the implementation of state legislation in sensitive domains (e.g., policing, school closures, access to long-term care facilities).

Our investigation focused on characteristics of the pandemic and containment approaches that coincided with high pandemic casualties in the country. The main research instrument was the PCSI applied to two samples ($n_1=26$, $n_2=9$). Our assessment of PCSI dimensions revealed that American states employed a Permissive Strategy in response to COVID-19. On the one hand, business restrictions and physical separation of people were significant, as reflected in the PCSI dimensions of mid-high Business Restrictions and high Social Distancing. On the other hand, a number of PCSI dimensions were low in extent.

The authorities advised citizens to stay at home and to defer non-essential travel rather than ordering and enforcing a restricted mobility as it happened in the Far East or some European countries (e.g., Italy, Spain, and France). This more permissive approach is reflected in the PCSI dimensions of low Lockdown and low state Border Control. Disease control measures were also of a small extent, as this is captured in the PCSI dimensions of Early Detection and Contact Tracing. The most dramatic example of neglecting early detection practices (disease tracking) was the lax treatment of Americans who returned home from the overseas in early 2020. This undeterred import of the COVID-19 pathogen was responsible for turning the states of New York and New Jersey into the early pandemic hub.

During the first wave, facial coverings were used only by the medical staff. This contrasts sharply with the universal use of facial coverings from the beginning in the Far East. For example, Taiwan deployed this measure based on its Influenza Pandemic Strategic Plan, and it never had to close schools or restrict severely businesses. Moreover, American states did not use law enforcement in support to the health emergency. Unlike China, Italy,

or South Korea, mandatory or police-controlled quarantines were not implemented. The same relaxed approach applied to electronic technology whose monitoring capabilities were not leveraged toward contagion tracking and tracing purposes.

Particularly hard hit were long-term care facilities. In the public health orders by state governors, this high-risk domain was typically less addressed than restaurants and bars. Yet, it accounted for 35%-40% of all mortalities in the country. The evidence on developments within long-term care facilities emerged slowly, and in some states mass media challenged its accuracy. A pattern emerged subsequently, in which an outbreak in these facilities would stir a public outcry, and then the state authorities would impose more protective measures (masking, restricted access, staff regulations).

Central coordination was missing and tensions between the health and government authorities emerged during the first pandemic wave. The former focused on protecting life, while the latter insisted on saving livelihood. In some cases, government authorities demonstrated neither a conviction in seriousness of the public health emergency nor a determination to solve it.

The post-first wave of the pandemic brought up some changes in NPI in the nine states investigated. There were advances in Contact Tracing, and in some state legislations (New York, California, and Florida). Facial coverings were embraced in some states, while others ignored or rejected it. Indeed, using face masks became one of the most contentious issues, a demarcation line between the policy endorsers and self-declared defenders of free choice among conservative politicians (including the American President), media, and laypeople.

Central coordination was still missing in containing the pandemic. The federal government leaders aggravated the situation by suppressing medical authorities and promoting unproven medications. This finding corroborates the literature.^{31, 32}

Categorizing the initial American approach to the COVID-19 pandemic as the Permissive Strategy is consistent with previous research that used the

PCSI to measure American state responses to the COVID-19 pandemic on the same sample.³⁰ It found that both the PCSI median value (7.8) and 19 of 26 states were in the PCSI's lower third range (1-11). Seven states were within the PCSI mid-range topped by the score of 14.6. It is noteworthy that this Permissive Strategy categorization counters the public outcry of the time, which was motivated by evident empty offices, streets, shopping malls, bars, restaurants, and sport and entertainment venues. The repercussion is that the PCSI's comprehensive coverage of NPI allows for determining the character of a pandemic response more effectively than assessments based on extraordinary but limited evidence.

A value of the PCSI is in revealing the NPI characteristics and dynamics in the country that experienced a significant pandemic mortality (15% of the reported global mortality, the 20th global rank on mortality/1 million population, and the highest mortality among the G7 countries). Another value of the PCSI is in its association with the mortality established in previous research.³⁰ A correlational study on the same 26-states sample found that the PCSI had a moderate negative association with mortality, as indicated in the Spearman Rho of -0.596 ($p < 0.001$). The larger the PCSI, the lower the mortality, and vice versa. The same study on the nine-state sample in the pandemic's post-first wave period found that variation in the PCSI was associated with states' relative mortality rankings at the start vs. the end of the observation period. The upward PCSI trend was associated with higher or stable relative mortality rankings, while the downward PCSI trend was associated with lower such rankings.³⁰ These findings are consistent with research on NPI effects.^{12, 13, 14}

6. Conclusion

Our study contributes to understanding COVID-19 pandemic in the U.S. and in the global context. Comprehensive studies of confronting the massive epidemics that COVID-19 presented can help practically to control better the detected challenges in the future. Another contribution concerns the development of instruments for investigating NPI

implementations. The PCSI is one such instrument that revealed characteristics and dynamics of confronting COVID-19 in the U.S. Prospective research needs to validate further and refine the PCSI.

The study concluded that that the U.S. took a Permissive Strategy venue in coping with the pandemic. This approach obviated a holistic, systematic, and coordinated approach for combating COVID-19. Such an approach is necessary to contain this highly contagious form of influenza. It may draw on the Hybrid Strategy that suits the Western constitutional and cultural contexts better than the Restrictive Strategy. The PCSI addresses three best practices used in the Hybrid Strategy—Distancing, Tracking, and Tracing. We add Testing and Treatment to these practices to propose a D&T strategic process (Figure 3).

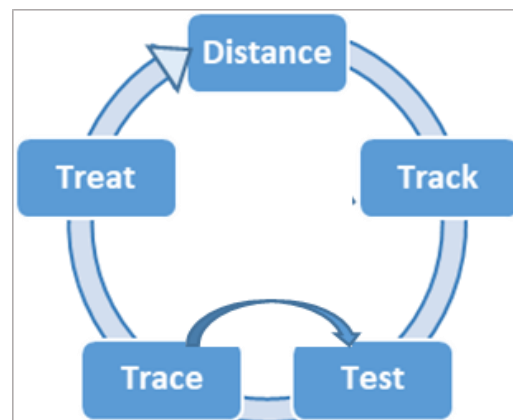


Figure 3. D&T Strategic Process

Social Distancing is the simplest effective step, but it carries a significant economic and broader social price. Therefore, it requires moderation and continuous adjustment. Finer containment measures commence with Tracking the contagion areas and people's movement. If Tracking is neglected, containment efforts are compromised even with successful Social Distancing. Tracking must be associated with Testing to make it purposive rather than blind and dependent on self-reported incidents. Tracing contacts with infected persons can prevent the emergence of clusters and uncontrollable branching. Because traced contacts require testing, Tracing feeds back to Testing.

Finally, the treatment step includes employing a triage-based approach to isolate the infected persons in different locations, monitor their progress, and heal them.

A national level pandemic strategy suits the D&4T model's implementation best. Undoubtedly, this model resonates with medical logic but it may be a useful reminder for other stakeholders playing roles in prospective influenza epidemics in the U.S. and elsewhere.

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