CALIFORNIA POLICY ACTIONS FOR

# PANDEMIC PREPARATION, RESPONSE, AND RECOVERY:

## Initial Recommendations

A White Paper prepared by the CCST COVID-19 Steering Committee.

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## CCST
### CALIFORNIA COUNCIL ON SCIENCE & TECHNOLOGY

# California Policy Actions for Pandemic Preparation, Response, and Recovery:
## *Initial Recommendations*

## White Paper*
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## About CCST

The California Council on Science and Technology is a nonpartisan, nonprofit organization established via the California State Legislature in 1988. CCST responds to the Governor, the Legislature, and other State entities who request independent assessment of public policy issues affecting the State of California relating to science and technology. CCST engages leading experts in science and technology to advise state policymakers—ensuring that California policy is strengthened and informed by scientific knowledge, research, and innovation.

## Note

# Table of Contents

# Executive Summary

In 2021, California Council on Science and Technology (CCST) staff and CCST's COVID-19 Steering Committee of experts (Committee) met with California policymakers, researchers, and practitioners from across CCST's expert network to understand the challenges faced in responding to the COVID-19 pandemic. Drawing on their diverse expertise and experiences, the Committee developed 34 recommendations for policymakers to consider as a start to addressing some of these challenges. Implementing these actions would improve California's resilience to the current COVID-19 pandemic and to looming future pandemics.

These recommendations represent what the Committee believe could be imminently actionable and would generate both immediate and long-term benefits for Californians. They have been reviewed by external subject matter experts and most are supported by peer-reviewed literature in the medical, public health, and social sciences. These recommendations are offered for consideration based on recent observations, conversations, and extensive experience, but without intensive research into current or developing policy actions. They are not intended to be comprehensive. Where funding estimates are provided, they are meant only to give a sense of scale; they have not been thoroughly researched.

The recommendations fall within six categories: A) public health staffing, messaging, and communication; B) increasing vaccination rates in underserved communities; C) improving information infrastructure; D) addressing the broader impacts of COVID-19; E) research; and F) other.

# High-Priority Recommendations

## The Committee identified six high-priority* recommendations:

B1: Funding for building and maintaining a network of partner organizations who are trusted nodes in higher risk communities; such partners may include nongovernmental organizations and religious institutions.

C1: Allocate $5 million for a comprehensive private/public process supported by the academic community to define what IT-enabled capabilities should be deployed and how these would best be developed and operated/supported.

C2: Require that all infectious disease reporting to county and state health departments and the patient care facilities be done digitally and as close to real time as possible.

C3: Explore the potential for requiring syndromic surveillance and clinical (symptoms) data collection and reporting by appropriate parties including community organizations, pharmacies, schools, etc.

E2: Funding to develop methods for combating misinformation and disinformation.

F3: Funding to train government officials, scientists, and community leaders in messaging and public communication.

*See Appendix A for prioritization scheme

# Initial Recommendations

## Made by the Committee

**(A)   Strengthening public health staffing, messaging, and communication** (pg. 12)

A1: Allocate funding to the Department of Health Care Services to improve the primary health service networks (including and in addition to Federally Qualified Health Centers and telehealth programs, the latter of which have played an important role in disaster response) to ensure that all Californians have good primary care and rapid access in emergent situations.

A2: Direct funding to the Division of Communicable Disease Control (DCDC) at CDPH.

A3: Direct funding to the Emergency Preparedness Office (EPO) at CDPH.

A4: Funding to hire and/or train dedicated communications staff (e.g., public health information officers) to manage and deliver emergency messaging at public health agencies.

Supporting material for recommendations is provided within. A guide to how these recommendations relate to provisions in the proposed 2022-23 Budget is included in Appendix B. **High-priority recommendations are denoted with asterisks.

A5: Funding to establish a communications coordinating role across public health and emergency management agencies.

A6: Funding to create public-private partnerships that can connect public health officials with communication professionals including news agencies, journalists, producers, as well as TV, film, and social media industries to develop effective science communication and messaging campaigns.

## (B) Increasing vaccination rates in underserved communities (pg. 15)

**B1: Funding for building and maintaining a network of partner organizations who are trusted nodes in higher risk communities; such partners may include non-governmental organizations and religious institutions.

B2: Develop a framework for the rapid assessment of vulnerable and high-risk groups in California—e.g., based on geography, race/ethnicity, socioeconomic status, language, and literacy.

B3: Funding for identifying effective vaccination-related messaging among different subpopulations.

B4: Allocate $20M for First 5, Head Start, and Migrant Head Start programs (on the basis of competitive proposals) for conversations and vaccination events with parents in the lowest quintile of census tracts (as measured by vaccination rates).

## (C) Improving information infrastructure (pg. 17)

**C1: Allocate $5 million for a comprehensive private/public process supported by California's academic community to define what IT-enabled capabilities should be deployed and how these would best be developed and operated/supported.

**C2: Require that all infectious disease reporting to city/local, county, and state health departments and the patient care facilities be done digitally and as close to real time as possible. This will also necessitate that all county and state health departments are equipped to receive electronic reports.

**C3: Explore the potential for requiring syndromic surveillance and clinical (symptoms) data collection and reporting by appropriate parties including community organizations, pharmacies, schools, etc.

C4: Consider pursuing information infrastructure that incorporates syndromic data, social media, internet search information, etc., to facilitate better situational awareness.

C5: Implement information infrastructure that facilitates bi-directional data exchange and the most seamless and timely integration possible of hospital and provider data with public health data.

C6: Develop and implement regular, independent, and metrics-based review of California's pandemic readiness by convening an expert independent panel. As part of this regular review, no less than annually, test the response system using live scenario exercises.

C7: Leverage contact tracing and case investigation efforts to a) enhance data collection and b) connect impacted individuals and households in disadvantaged communities to social services to support isolation and quarantine.

C8: Bolster efforts to make public health information more easily accessed by the public and more visually engaging.

C9: Pursue and maintain more capable IT infrastructure, including online sites that have more routine functionality such that in the event of the next public health emergency, existing online IT infrastructure can be readily adapted rather than designed de novo.

C10: Develop a unified pathogenic wastewater surveillance system for California and require that all reporting be submitted to the California Department of Public Health.

## (D)   Addressing the broader impacts of COVID-19 (pg. 22)

D1: Funding to expand California's long COVID-19 clinics.

D2: Partner with community organizations and internet providers to offer expanded free internet access to isolated and disproportionately impacted populations.

D3: Increase funding for evidence-based suicide prevention strategies and services, including enhanced screening and tracking for depression, anxiety, substance use disorders, and suicidality.

## (E)   Research (pg. 24)

E1. Funding for developing the infrastructure for rapidly implementing an ongoing, twice monthly, state-wide social and behavioral survey of pandemic-related public attitudes that is representative down to the county-level, to be deployed in the event of future public health emergencies.

**E2. Funding to develop methods for combating misinformation and disinformation campaigns.

E3. Allocate $2 million for improved investigation and reporting regarding workplace outbreaks of COVID-19.

E4. Allocate $2 million for improved data and research on ultra-vulnerable populations including undocumented immigrants and prison populations.

E5. Allocate $1.5 million to study the successes and failure modes in serving the full cycle of citizen needs at the local level during the COVID-19 pandemic.

E6. Allocate $1 million for assessment of conditions in detention facilities for immigrants, enforcement, and corrective action as necessary.

E7. Assess conditions across California's nursing homes and other long-term care facilities and develop solutions to systemic challenges and better mitigate risks.

## (F)   Other (pg. 28)

F1: Implement a statewide initiative to provide universal screening for COVID-19 vulnerability and the ability to mobilize this capability for other infectious diseases that may lead to a pandemic.

F2: Consider implementing ventilation standards into building codes, especially in public spaces where masks are not typically worn indoors (e.g., restaurants). These standards could be applied to future buildings and establish a process for retrofitting older ones.

**F3: Funding to train government officials, scientists, and community leaders in messaging and public communication.

F4: Allocate $4 million in funding for professional education associations to build their memberships' involvement in vaccination promotion.

# Discussion of

# Recommendations

The California Council on Science and Technology (CCST)'s COVID-19 Steering Committee—a group of experts convened by CCST to discuss the topic of COVID-19 and its myriad challenges—has assembled recommendations for policy actions that address challenges faced by policymakers throughout the COVID-19 pandemic. If implemented, these actions would ensure we are better prepared for the next pandemic. They largely fall within six broad categories: A) strengthening public health staffing, messaging, and communication; B) increasing vaccination rates in underserved communities; C) improving information infrastructure; D) addressing the broader impacts of COVID-19; E) research; and F) other.

These initial recommendations represent what the Committee believe could be imminently actionable and would generate both immediate and long-term benefits for Californians. They have been reviewed by external subject matter experts and are supported by peer-reviewed literature in the medical, public health, and social sciences. These recommendations are offered for consideration based on recent observations, conversations, and extensive experience, but without intensive research into current or developing policy actions. They are not intended to be comprehensive. Where funding estimates are provided, they are meant only to give a sense of scale; they have not been thoroughly researched.

# (A)    Strengthening public health staffing, messaging, and communication

These are the front line in our pandemic response and have been historically under-resourced. These important departments need appropriately compensated and trained personnel and sufficient staff levels to respond to general public health issues and epidemics/pandemics.

Standing capabilities should be prioritized in funding efforts; increased funding must be sustained over time if these investments are to produce maximum benefits. The first three recommendations speak to general resource and staffing needs at local/county health departments and the California Department of Public Health (CDPH). The subsequent three recommendations are specific to improving messaging and communications capabilities at California's health departments. Since the start of the COVID-19 pandemic, public health messaging has at times been confusing, inconsistent, and incoherent: some media outlets simultaneously reported conflicting information, and new information occasionally contradicted information that came previously. This was the case with basic preparedness (masks, types and how to use) and response (testing and vaccinations). Communication and public health experts believe that the lack of coordination in COVID-19 messaging across organizations, media outlets, and public health officials may have ultimately contributed to greater amounts of public distrust in official information sources[1] and perhaps exacerbated societal divisions.

A1.    Allocate funding to the Department of Health Care Services to improve the primary health service networks (including and in addition to Federally Qualified Health Centers and telehealth programs, the latter of which have played an important role in disaster response) to ensure that all Californians have good primary care and rapid access in emergent situations. This may include identifying non-traditional organizations that have trusted relationships with their communities and using them for primary care (see recommendation B1).[2,3] By providing preventative

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1       Ratzan et al. 2020. COVID-19: An urgent call for coordinated, trusted sources to tell everyone what they need to know and do. Journal of Health Communication 25:747-749.

2       Erickson and Andrews. 2011. Partnerships among community development, public health, and health care could improve the well-being of low-income people. Health Affairs 30: 2056-2063.

3       Brownson et al. 2007. Clinic-community partnerships: a foundation for providing community supports for diabetes care and self-management. Diabetes Spectrum 2-:209-214.

care and treating mild cases, primary care reduces the burden placed on hospitals during pandemics. Further, disruptions to primary care caused by the COVID-19 pandemic resulted in many indirect health costs even for those who did not contract COVID-19 (due to deferred preventative care and the delay of non-emergency procedures).[4] Improving primary health service networks will help reduce these indirect health costs during this and future pandemics. Further, primary health service networks can play an important role in reducing health inequities resulting from long-COVID.[5]

A2.     Direct funding to the Division of Communicable Disease Control (DCDC) at CDPH. DCDC works to promptly identify, prevent, and control infectious diseases that pose a threat to public health, including emerging and re-emerging infectious diseases, vaccine- preventable agents, bacterial toxins, bioterrorism, and pandemics. This funding should be deployed in part directly to DCDC and in part with the partner organizations at the local and county level that provide source data and implement interventions. This effort is also dependent on improved information technology (IT) infrastructure resourcing (see section C)—information needs to be made available to local responders and researchers in a timely and accurate manner.

A3.     Direct funding to the Emergency Preparedness Office (EPO) at CDPH. The EPO coordinates overall emergency planning and preparedness efforts for CDPH. Additional funding would help the EPO better plan and execute the following activities to prepare Californians for public health emergencies: a) oversee statewide public health disaster planning, b) distribute and oversees funds to local health departments for disaster planning, c) operate and maintain the California Health Alert Network (CAHAN), d) maintain and manage the Medical and Health Coordination Center (MHCC), e) collaborate with partners to develop the Statewide Medical and Health Exercise, and f) coordinate planning for the Strategic National Stockpile.

A4.     Funding to hire and/or train dedicated communications staff (e.g., public health information officers) to manage and deliver emergency messaging at public health agencies. Well-developed, consistent emergency communications result in greater public uptake of risk mitigation strategies, enhance credibility, and in-

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4       Alsan et al. 2021. The great unequalizer: initial health effects of COVID-19 in the United States. Journal of Economic Perspectives 35:25-46.

5       Berger et al. 2021. Long COVID and health inequities: the role of primary care. The Milbank Quarterly 99:519-541.

crease public trust.[6] These dedicated communication positions could be modeled after public information officers that work with Incident Command Systems and Emergency Operations Center organizations.[7] These communications staff could also contribute to more diverse engagement strategies to reach a wider audience (e.g., via Twitter). The communications strategy should include the development of improved quarantine and isolation guidelines to be provided to exposed (or COVID-19 positive) individuals during contact tracing efforts.

A5.    Funding to establish a communications coordinating role across public health and emergency management agencies. When public health agencies coordinate their messaging, they reduce the degree to which inconsistent information is introduced to the public; this coordination fosters greater trust in public communications and limits confusion.[8]

A6.    Funding to create public-private partnerships that can connect public health officials with communication professionals including news agencies, journalists, producers, as well as TV, film, and social media industries to develop effective science communication and messaging campaigns. These partnerships would allow qualified professionals more direct access to the public for the timely dissemination of important information alongside communication professionals who could help them tailor their messaging to be more effective.[9,10] California is the center of the TV, film, and social media industries.

These are underutilized resources for getting ahead on messaging to provide accessible information and promote safety as well as community sentiments essential for coping with infectious disease pandemics. An important challenge that could be

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6       Malecki et al. 2021. Crisis communication and public perception of COVID-19 risk in the era of social media. Clinical Infectious Diseases 72:697-702.

7       FEMA 2020. National Incident Management System basic guidance for public information officers.  https://www.fema.gov/sites/default/files/documents/fema_nims-basic-guidance-public-information-officers_12- 2020.pdf

8       Tagliacozzo et al. 2021. International perspectives on COVID-19 communication ecologies: public health agencies' online communication in Italy, Sweden, and the United States. American Behavioral Scientist 65:934-955.

9       Mheidly and Fares 2020. Leveraging media and health communication strategies to overcome the COVID-19 infodemic. Journal of Public Health Policy: 1-11.

10      Omer et al. 2021. Promoting COVID-19 vaccine acceptance: recommendations from the Lancet Commission on vaccine refusal, acceptance, and demand in the USA. The Lancet 398:11-17.

addressed in such partnerships would be to build awareness among public health professionals of the distinctive needs of different media—e.g., broadcast TV and radio vs. print vs. online media.

## (B)  Increasing vaccination rates in underserved communities

California has been one of the leading states in vaccination for the SARS-CoV-2 virus, but many populations within the state have low rates of vaccination and testing. Research has revealed several complex barriers to vaccine uptake in disadvantaged, low-income, and multi-ethnic communities including logistical access issues, misinformation, politicization, and a distrust of institutions given historical inequities and mistreatment.[11] With prior support from NIH under their Community Engagement Alliance (CEAL) program,[12] and support from the State, health care professionals at UCLA led a network of 11 academic institutions who partnered with community organizations to reach, educate, and vaccinate many of those considered high-risk or hard-to-reach. Our ability to build on these successes requires further investment and research.

B1.    Funding for building and maintaining a network of partner organizations who are trusted nodes in higher risk communities; such partners may include nongovernmental organizations and religious institutions. Community engagement has been repeatedly advocated as a means through which to increase vaccination rates in underserved or disadvantaged communities. Such efforts would significantly benefit from leveraging existing local networks and partnerships with trusted organizations and individuals,[13] and, where there is none, building partnerships with these trusted messengers. Local NGOs and religious leaders are often more trusted than representatives of state institutions and will have better understandings of the precise challenges present in their communities and critical historical context.[14]

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11      Carson et al. 2021. COVID-19 vaccine decision-making factors in racial and ethnic minority communities in Los Angeles, California. JAMA Network Open 4:e2127582.

12      National Institutes of Health 2020. https://covid19community.nih.gov

13      Linnan et al. 2014. A literature synthesis of health promotion research in salons and barbershops. American Journal of Preventive Medicine 47:77-85.

14      Dumm and King 2021. Community-based strategies to engage pastors can help address vaccine hesitancy and heal disparities in black communities. Journal of Health Communication 25:827-830.

# Discussion of Recommendations

These partners can help public health officials to understand the concerns of their communities, tailor their messaging, and ultimately address the barriers that produce inequitable access to vaccines.[15] For example, a community-academic-public health partnership called "Unidos en Salud" proved to be a successful strategy for reaching (and vaccinating) members of San Francisco's Latinx community.[16]

B2.     Develop a framework for the rapid assessment of vulnerable and high-risk groups in California—e.g., based on geography, race/ethnicity, socioeconomic status, language, and literacy. One cost effective strategy would be to leverage existing surveys (e.g., the California Health Interview Survey) in pursuit of these data. Such a framework would facilitate a more rapid deployment of resources towards those communities identified as most vulnerable and at risk of becoming hotspots.[17]

B3.     Funding for identifying effective vaccination-related messaging among different subpopulations. Public health communications are more effective when they are tailored to the recipients.[18] Given the incredible diversity present in California, public health officials would benefit from knowing which messages are likely to be most effective for different members of their communities. Special attention should be paid towards developing messaging for demographics known to be at higher risk for COVID-19 infection. Partner organizations identified above (B1) would make useful allies in this effort.

B4.     Allocate $20M for First 5, Head Start, and Migrant Head Start programs (on the basis of competitive proposals) for conversations and vaccination events with parents in the lowest quintile of census tracts (as measured by vaccination rates). Immediate investment is justified because it is extremely likely that a vaccine will be authorized and recommended for 2-5-year-olds within the next few months. Thus far, rates of vaccination for children have lagged behind adult vaccination rates. Vaccine-hesitant parents often express concerns about vaccine safety and a

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15      Burgess et al. 2021. The COVID-19 vaccines rush: participatory community engagement matters more than ever. Lancet 397:8-10.

16      Marquez et al. 2021. A multi-component, community-based strategy to facilitate COVID-19 vaccine uptake among Latinx populations: from theory to practice. PLoS ONE. https://doi.org/10.1371/journal.pone.0257111

17      Kiaghadi et al. 2020. Assessing COVID-19 risk, vulnerability and infection prevalence in communities. PLoS ONE 15:e0241166.

18      Capron et al. 2021. Public health lessons for non-vaccine influenza interventions: looking past COVID-19. The National Academies Press. Washington, D.C.

belief that children are at low-risk for developing severe COVID.[19],[20]These data suggest a targeted messaging approach may be necessary for improving childhood vaccination rates. However, CDPH and local public health departments may not be well-positioned to catalyze and promote messaging about vaccination or other safety measures that engage diverse community institutions in communicating with their constituencies. Increasing childhood vaccination rates will require a "broad spectrum" community response with diverse stakeholder groups involved. Direct investment in mobilizing education system networks has tremendous potential. Nevertheless, organizational partners in the education system have, to date, been engaged and mobilized unevenly. Therefore, priority should be placed on investing in entities that have close relationships with and are "trusted voices" for persuading parents to get their children vaccinated. A "combined indicator" that includes 1) adult vaccination rates for the 18–40-year-old demographic groups most likely to have children at home and 2) vaccination rates among children should be used to identify priority communities.

## (C)   Improving information infrastructure

California's policymakers experienced many challenges related to the distribution and access of critical public health information. Bottlenecks in information path-ways, incompatible datasets, and outdated technologies slowed the rate at which public health officials could perceive and respond to a constantly evolving threat.[18]

C1.    Allocate $5 million for a comprehensive private/public process supported by California's academic community to define what IT-enabled capabilities should be deployed and how these would best be developed and operated/supported. This should lead to a system architecture that is capable of supporting the functions de-scribed in C2-C10.

Before any new capabilities are developed or existing systems enhanced, there should be a clear understanding of the features necessary for health care systems to operate most successfully during pandemics. Given this need, the scope of the health care system should be discussed and clearly defined. An independent organi-

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19      Teasdale et al. 2021. Parental plans to vaccinate children for COVID-19 in New York City. Vaccine 39:5082-5086.

20      Fisher et al. 2022. COVID-19 pediatric vaccine hesitancy among racially diverse parents in the Unit-ed States. Vaccines 10:31.

zation should convene third-party technology experts from California's universities and research institutions, county/local public health and healthcare communities, and the private sector to establish a vision of an effective information system and delineate a clear process for its development. If engaged at the outset of this process, as proposed here, external organizations would more effectively be included as partners to—or even part of—the public health system. Effective collaboration with a broad spectrum of stakeholders who share concerns about public health and community well-being will better position the public health system to respond to future crises like the current pandemic.[21,22,23]

C2.      Require that all infectious disease reporting to city/local, county, and state health departments and the patient care facilities be done digitally and as close to real time as possible. This will also necessitate that all county and state health departments are equipped to receive electronic reports. A 2018 study found that 41.2% of hospitals surveyed across the United States had indicated that their respective health departments were incapable of receiving electronic data even if the hospitals themselves were capable of sending it.[24] Data delivered via fax, email, or regular mail to public health departments must be manually uploaded into databases for analysis. This time-consuming extra step introduces strains on existing staff resources, opportunities for error in data transcription, and information bottlenecks leading to missed opportunities for timely responses.[25] There are existing efforts such as CalREDIE, but these systems need critical external review and perhaps replacement with more effective, economic, and functioning systems capabilities. We recommend that these systems be reviewed—and upgraded if deemed necessary—at least once every 5 years thereafter.

21      Jacobson et al. 2020. COVID care clinic: a unique way for family medicine to care for the community during the SARS CoV-2 (COVID-19) pandemic. Journal of Primary Care and Community Health. Doi: https://doi.org/10.1177/2150132720957442.

22      Moir et al. 2021. The critical role Hawaii's community health workers are playing in COVID-19 response efforts. Hawaii Journal of Health and Social Welfare 80:46-49/

23      Brown et al. 2020. COVID-19 disparities and the black community: a health equity-informed rapid response is needed. American Journal of Public Health 110:1350-1351.

24      Holmgren et al. 2020. Barriers to hospital electronic public health reporting and implications for the COVID-19 pandemic. Journal of the American Medical Informatics Association 27:1306-1309.

25      Madhavan et al. 2020. Use of electronic health records to support a public health response to the COVID-19 pandemic in the United States: a perspective from 15 academic medical centers. Journal of the American Medical Informatics Association 28:393-401.

C3.    Explore the potential for requiring syndromic surveillance and clinical (symptoms) data collection and reporting by appropriate parties including community organizations, pharmacies, schools, etc. Syndromic and clinical surveillance systems are the systematic collection, reporting, and analysis of symptoms and preliminary diagnoses gathered in clinical settings and via routine patient care (as opposed to laboratory confirmed diagnoses). Syndromic and clinical surveillance can aid in the early detection of new pathogens and impending outbreaks, allowing for earlier containment and mitigation strategies.[18]

C4.    Consider pursuing information infrastructure that incorporates syndromic data, social media, internet search information, etc., to facilitate better situational awareness. Current data models are rather limited in the information they can provide. They incorporate only data via formal medical charts, locations, etc. Incorporating data from other sources offers value for more accurate and comprehensive disease surveillance. Social media and search engine data may provide early indicators of emerging situations faster than formal data collection allows.[26,27] This improvement would enable faster and more effective local, regional, and state public health and related agency/sector responses, as well as evaluation of programmatic and policy interventions.

C5.    Implement information infrastructure that facilitates bi-directional data exchange and the most seamless and timely integration possible of hospital and provider data with public health data. Data currently flow from primary providers (or hospitals) to County, to State, and then to the Federal government (with some data redactions along the way). There is very little near-real-time feedback of data to the local level (e.g., if a case of a reportable disease is identified in a hospital, other local providers are not informed).[28] To address this lack of data feedback, the State should pursue:

    a.    Automated systems that update (in real time) reporting of notifiable physician offices to the state and local public health departments.

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26    Crooks et al. 2013. #Earthquake: Twitter as a distributed sensor system. Transactions in GIS 17: 124-147.

27    Gupta and Katarya 2020. Social media based surveillance systems for healthcare using machine learning: a systematic review. Journal of Biomedical Informatics: 103500.

28    Madhavan et al. 2021. Use of electronic health records to support a public health response to the COVID-19 pandemic in the United States: a perspective from 15 academic medical centers. Journal of the American Medical Informatics Association 28:393-401.

b. Capacity to quickly and accurately link across public health databases including laboratory records and electronic health records (EHR) for notifiable diseases.[29,30]

c. State-of-the-art technologies to query databases such as EHR on public health trends. Such a platform should support multiple apps and decentralized data.

d. Ability to warehouse these data in a HIPPA-compliant environment with the ability to appropriately anonymize or de-identify individual records with an organization charged with the timely access and exchange of information. A central location will allow timely access by researchers, policy makers, and others in the broader health care system who need these data. Large-scale and interconnected academic institutions in California, such as the University of California or federal labs, have the capabilities to do this at scale. This approach would relieve CDPH of the need to support the broader health community during a time of pandemic but make these data quickly and readily available to qualified users for approved uses.

e. Institutional mechanisms that ensure ethical data sharing while alleviating bureaucratic barriers often faced by organizations attempting to share data where there are potential privacy concerns.[31]

C6. Develop and implement regular, independent, and metrics-based review of California's pandemic readiness by convening an expert independent panel. As part of this regular review, no less than annually, test the response system using live scenario exercises. This periodic exercise could emulate the Golden Guardian series conducted 2004-2013 by California Governor's Office of Emergency Services which trained and primed local, state, federal, and private sector partners to respond

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29    Sudat et al. 2021. Mind the clinical-analytic gap: electronic health records and COVID-19 pandemic response. Journal of Biomedical Informatics 116:103715.

30    Sitting and Singh. 2020. COVID-19 and the need for a national health information technology infrastructure. JAMA 323:2373-2374.

31    Fairchild et al. 2017. Ethics of public health surveillance: new guidelines. The Lancet 2:E348-E349.

to natural and man-made disasters in California.[32]

C7.    Leverage contact tracing and case investigation efforts to a) enhance data collection and b) connect impacted individuals and households in disadvantaged communities to social services to support isolation and quarantine. Enhanced data collection efforts should include provisions to generate and report data from a stratified, randomly sampled fraction of all case investigation and contact-tracing cases. Procedures should be developed to overcome the inevitable sampling shortcomings due to non-response to case investigation. Some counties currently report metrics regarding contract-tracing implementation; however, efforts should be made to identify additional useful data that could be generated from appropriate sampling and data analysis. Such data could provide deeper insights into COVID-19 transmission[33] while, at the same time, yielding insights to mitigate serious limitations of current contact-tracing in linguistically and socioeconomically diverse communities. Low levels of adherence to quarantine and self- isolation during the COVID-19 pandemic reduced the efficacy of contact tracing in reducing transmission rates. Common reasons cited for breaking quarantine or isolation include economic hardship and the need to purchase essentials.[34] Providing support services to facilitate quarantine is believed to increase rates of adherence to quarantine guidelines.

C8.    Bolster efforts to make public health information more easily accessed by the public and more visually engaging. A recent issue of the CDC's Morbidity and Mortality Weekly Report[35] discussed California data. California should not be waiting on the CDC for its own data but rather the State should have the ability to quickly report its own data, on a locally relevant basis, and to drill down to support timely action. As another example, the COVID-19 Cases Dashboard[36] by CA Open Data is limited in its capabilities: a) these data do not illustrate hospitalizations with de-

32      California Governor's Office of Emergency Services 2013. Golden Guardian 2013 Exercise Series Executive Brief. https://www.caloes.ca.gov/CaliforniaSpecializedTrainingInstituteSite/Documents/GG13%20 Exercise%20Series%20 Executive%20Brief.pdf

33      Kwan et al. 2021. Mining relationships between transmission clusters from contact tracing data: an application for investigating COVID-19 outbreak. Journal of the American Medical Informatics Association 29:2385-2392.

34      Patel et al. 2021. How can we improve self-isolation and quarantine for COVID-19? BMJ 372:625.

35      León et al. 2022. COVID-19 cases and hospitalizations by COVID-19 vaccination status and previous COVID-19 diagnosis—California and New York, May – November 2021.

36      CA Open Data 2022. COVID-19: California case statistics. https://public.tableau.com/app/profile/ ca.open.data/viz/COVID-19CasesDashboardv2_0/CaseStatistics

mographic breakdowns, b) demographic data is only available for cumulative cases and death, c) there is limited information about vaccine rates, and d) there's no information about cases and deaths by vaccination status (reporting breakthrough infections can promote boosters). Consistent and timely reporting of COVID-19 data in a manner that can be readily accessed and understood by the public can improve trust in the government and helps to combat disinformation.[37]

C9.	Pursue and maintain more capable IT infrastructure, including online sites that have more routine functionality such that in the event of the next public health emergency, existing online IT infrastructure can be readily adapted rather than designed de novo. This item could be refined as part of C1, above. Californians experienced many difficulties accessing online registration during the vaccine rollout;[38] there were also IT challenges associated with expanding the available cadre of vaccinators. The State should consider allocating more sustained funding to hire and retain well-qualified staff at CalHHS, CDPH, and other agencies to manage upgraded IT systems.

C10. Develop a unified pathogenic wastewater surveillance system for California and require that all reporting be submitted to the California Department of Public Health. Numerous localized wastewater surveillance systems provide evidence that COVID-19 is readily detectable in untreated sewage. A statewide wastewater surveillance system could provide early warning of community outbreaks of COVID-19 as well as future pathogens of pandemic potential.[39]

## (D)	Addressing the broader impacts of COVID-19

D1.	Funding to expand California's long COVID-19 clinics. Patients exposed to the SARS- CoV-2 virus can develop new or returning COVID-19 symptoms four or more weeks after the initial exposure. These new or returning symptoms can last for weeks or months; approximately 33% of people infected with the virus

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37	Kissam 2020. The impact of the COVID-19 pandemic on California farmworkers: better local data collection and reporting will improve strategic response. Statistical Jounral of the IAOS 36: 867-898.

38	Ostrov 2021. State's 'MyTurn' website bypassed for most vaccine appointments. CalMatters. https://calmatters.org/health/coronavirus/2021/04/myturn-vaccine-appointments-problems/

39	Farkas et al. 2020. Wastewater and public health: the potential of wastewater surveillance for monitoring COVID-19. Current Opinion in Environmental Science & Health 17:14-20.

will develop lingering symptoms.[40,41] Patients with "long COVID" qualify for the Americans with Disabilities Act (ADA), and they require treatment at specialized COVID-19 clinics that can provide multidisciplinary care, therapy, and research. Expanding the number of long COVID-19 clinics in California will help provide care and treatment for those with this condition, while advancing the research into effective treatments for battling long COVID-19.

D2.    Partner with community organizations and internet providers to offer expanded free internet access to isolated and disproportionately impacted populations. Disparities in internet access combined with the closures of schools, business, and libraries have exacerbated inequalities in education and information access.[42] Racially/ethnically and socio-economically diverse populations bearing a disproportionate burden of COVID-19 infection, hospitalization, and mortality are also digitally disadvantaged. Internet access needs to be addressed with clear-cut priority being given to overcoming internet access to information and/or advice. While the Broadband Action Plan worked to address issues of internet access, the Public Policy Institute of California reports that progress stalled in spring 2021 and gaps remain for low-income communities.[43] One problem that particularly affects rural low-income groups such as farmworkers is lack of broadband access, but perhaps a more serious problem relates to devices being used. Internet response partnerships should provide appropriate devices (e.g., tablets with cellular connectivity) to low-income vulnerable households coupled with access to training/support in increasing digital literacy. Improved internet access has also been suggested as an approach to combating the mental health crisis precipitated by the COVID-19 pandemic (by enabling participation in mental telehealth services).[44] Three things can be done to address these gaps in access:

    a.   The Emergency Broadband Benefit is a stopgap which is being replaced by

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40      Logue et al. 2021. Sequelae in adults at 6 months after COVID-19 infection. JAMA Network Open 4:e210830.

41      Yomogida et al. 2021. Post-acute sequelae of SARS-CoV-2 infection among adults aged ≥ 18 years—Long Beach, California, April 1-December 10, 2020. Morbidity and Mortality Weekly Report 70:1274-1277.

42      Wang et al. 2020. Addressing inequities in COVID-19 morbidity and mortality: research and policy recommendations. Translational Behavioral Medicine 10:516-519.

43      Hayes and Gao 2021. Achieving digital equity for California's students. Public Policy Institute of California. https://www.ppic.org/publication/achieving-digital-equity-for-californias-students/.

44      Cuellar et al. 2020. How to mitigate the mental health care consequences of the COVID-19 financial crisis. Economic Psychiatric Services 71:1317-1319.

the Affordable Connectivity Program (ACP) administered by the FCC.[45] In virtually all communities, this benefit is undersubscribed. Community-based organizations should be resourced to both enroll their clients in the new ACP and provide technical assistance to them to allow residents to be fully able to engage in digital services. There is also the need for appropriate devices—the State can work with private sector and philanthropic organizations focusing on closing the device gap.

b.  The State can explore redirecting some of the recently authorized broadband funds and new funds coming under Federal programs to extend broadband service to all Californians.

c.  As time is of the essence, the State can work with small and large ISPs to identify service or funding gaps that would help to close the digital divide.

D3.    Increase funding for evidence-based suicide prevention strategies and services, including enhanced screening and tracking for depression, anxiety, substance use disorders, and suicidality. The COVID-19 pandemic has introduced many challenges to mental wellbeing, including increased loneliness, stress, and economic hardship. Unemployment rates are correlated with increased rates of suicide.30 An estimated 53% of US adults who practiced social isolation reported that stress over COVID-19 was having a "major negative effect" on their mental health.[46] Self-reported rates of depression, anxiety, substance use, and suicidal ideation have all increased since the beginning of the pandemic.[47] Support should be channeled towards evidence-based strategies for all levels of risk (i.e., universal, selective, and indicated).[48] The expansion of telehealth delivery, especially for treating mental health and substance use disorders, would help address issues of limited access to treatment.

# (E)   Research

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45        https://www.fcc.gov/affordable-connectivity-program

46        Moutier 2020. Suicide prevention in the COVID-19 ear: transforming threat into opportunity. JAMA Psychiatry 78:433-438.

47        Czeisler et al. 2020. Mental health, substance use, and suicidal ideation during the COVID-19 pandemic: United States. Morbidity and Mortality Weekly Report 69:1049-1057.

48        Wasserman et al. 2020. Adaptation of evidence-based suicide prevention strategies during and after the COVID- 19 pandemic. World Psychiatry 19:294-306.

E1.     Funding for developing the infrastructure for rapidly implementing an on-going, twice monthly, state-wide social and behavioral survey of pandemic-related public attitudes that is representative down to the county-level, to be deployed in the event of future public health emergencies. This survey data would be used as a social barometer to gauge changes in public attitudes over time and evaluate interventions in different counties. Presently, public health is too dependent upon private survey companies for such data, and the data sources and content are too scattered and incomplete to be useful for informing decision-making and evaluating initiatives. Furthermore, existing surveys often contain too few items that are of limited use, and are infrequently re-assessed in subsequent polls, hampering use of such valuable data in any coordinated way. For California, a particular problem is assuring adequate representation of hard-to- reach populations in surveys. Developing an enhanced infrastructure will require expert attention to sampling and survey implementation approaches that will represent racially/ethnically diverse populations in California—especially immigrants and undocumented. In addition to ongoing collection, the infrastructure would include the capacity for rapid assessment and reporting, and results would be available to local public health agencies, and academic and other researchers.

E2.     Funding to develop methods for combating misinformation and disinformation campaigns. Social media has allowed for the unprecedented spread of mis- and disinformation during the COVID-19 pandemic, complicated further by the willful spread by some in the public spotlight. We need research that demonstrates effective strategies for overcoming mis- and disinformation.

E3.     Allocate $2 million for improved investigation and reporting regarding workplace outbreaks of COVID-19. Although there have been serious workplace outbreaks of COVID-19 in some smaller agricultural counties (e.g., Madera, Kings), there have not been resources to investigate those outbreaks adequately. Lack of data on these outbreaks, in turn, hinders both the technical and operational ability of Cal/OSHA to assess compliance with regulations regarding identification and isolation of COVID-19+ workers and identification and quarantine of their close contacts.[49] Targeted funding is required to provide a basis for improved regulatory guidance and, perhaps more importantly, for technical assistance to businesses

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49        National Center for Immunization and Respiratory Diseases. 2021. Investigating and responding to COVID-19 cases in non-healthcare work settings. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/community/workplaces-businesses/investigating-non- healthcare.html

to allow them to responsibly identify patterns of COVID-19 transmission (crucial in part due to increased transmissibility of Omicron). Quick-turnaround research could be conducted for about $1.3 million, leaving $700,000 for review and enhancement of current regulations and technical assistance/training for businesses in counties that lack the organizational capacity to conduct the training themselves.

E4.      Allocate $2 million for improved data and research on vulnerable populations including undocumented immigrants and prison populations. Pilot case studies in 2 urban and 2 rural counties could be designed and implemented for $2 million. Their findings would then be used as the basis for securing subsequent supplemental funding for further research from NIH, other divisions of HHS, or even private foundations. Standard public health data collection/reporting systems inevitably have limitations in generating reliable "real world", "real time" data on vulnerable populations. There is ample evidence, for example, of people continuing to work even when positive (especially if they have only mild symptoms or are asymptomatic).[50] There is also evidence that, due to ongoing limitations of testing and access to health care (including diagnosis/referral), standard reporting of COVID-19 positivity results is underestimated in the neighborhoods with the lowest health equity scores.[51] Population sub-groups—most notably, working-age undocumented immigrants not yet covered by Medi-Cal—also lack health insurance in many cases and are almost certainly underrepresented in datasets of hospitalized patients. This, in turn, results in possible biased estimates of long COVID incidence.

Funding should be made available for targeted studies of the impact of COVID-19 in these vulnerable groups. Case studies might address specific issues that affect California's multi-ethnic population and communities of immigrants. For example, one study might examine the mental and behavioral health and economic impacts that "long COVID" has when an undocumented breadwinner in a household is affected. Another could examine patterns of utilization of at-home COVID-19 antigen tests in low-income households with essential workers and children; this case study would provide actionable insights for strengthening overall testing strategy and an improved understanding of reported vs. unreported testing. Also urgently

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50      Eskenazi et al. 2020. Prevalence and predictors of SARS-CoV-2 infection among farmworkers in Monterey County, CA: summary report. UC Berkeley School of Public Health and Clinica de Salud del Valle de Salinas. https://cerch.berkeley.edu/sites/default/files/ucb_csvs_white_paper_12_01_20_final_compressed.pdf

51      Dryden-Peterson 2021. Disparities in SARS-CoV-2 testing in Massachusetts during the COVID-19 pandemic. JAMA Network Open 4:e2037067.

needed is research on disadvantaged population groups' access to and utilization of social media; without such research, investment in messaging via social media is flying blind in efforts to reach the most vulnerable groups.

E5.    Allocate $1.5 million to study the successes and failure models in serving the full cycle of citizen needs at the local level during the COVID-19 pandemic. The pandemic has both exposed systemic weaknesses in our health care system and generated an exciting set of new approaches to prevention and care. We have learned a great deal in the past months about how to best serve large numbers of California citizens, many of whom have historically been unserved or underserved by the traditional care system. However, most of this has not been systematically documented or comprehensively studied from the perspective of outcomes or service delivery economics. In order for the State to most effectively learn from both the successes and failures of the past two years, the studies supported by these funds would:

    a.    document case studies of access, care, and prevention from across the State

    b.    document and compare the economics of service provisioning across the different sites and service models

    c.    inform both policy and funding recommendations as well research publications to help others learn from these important experiences.

E6.    Allocate $1 million for assessment of conditions in detention facilities for immigrants, enforcement, and corrective action as necessary. New urgency legislation (AB 263, enacted in September 2021) clarifies that the California public health system has jurisdiction over conditions in privately-operated and federally-operated immigrant detention facilities. However, a recent whistleblower complaint by DHS health consultants describes extensive violations of CDC guidelines regarding vaccination of detained individuals and skyrocketing incidence of COVID-19.[52] This funding would support:

    a.    investigation and monitoring of conditions

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[52]    Allen and Rich 2022. Boosters, other measures needed to protect workers, immigrants and the public from COVID-19 in immigration detention settings. https://drive.google.com/file/d/11YadbBAZ31K2VKg7P_ivCk2NojOVuc1U/view

b. technical assistance to detention centers

c. recommended activities such as partnerships with community-based organizations and health providers to address the current limitations, promote vaccine acceptance, and provide on-site vaccination events.

E7.    Assess conditions across California's nursing homes and other long-term care facilities and develop solutions to systemic challenges and mitigate risks. Since the start of the COVID-19 pandemic, residents and staff at nursing homes and other long-term care facilities have accounted for a disproportionate number of COVID-19 deaths in the United States and abroad.[53] There are several key challenges that are largely unique to long-term care facilities, including close living quarters, the average age of residents, the degree to which residents require intimate care, a high rate of comorbidities, and rates of cognitive impairment. These characteristics—combined with well-known issues of high staff-turnover—create significant challenges in controlling the spread of respiratory illnesses like COVID-19.

## (F)   Other

F1.    Implement a statewide initiative to provide universal screening for COVID-19 vulnerability and the ability to mobilize this capability for other infectious diseases that may lead to a pandemic. As highly effective treatments (like antivirals and monoclonal antibody treatments) become more widely available to treat individuals who are at high risk for severe COVID-19, it will be crucial to work toward universal assessment of Californians with respect to identified conditions. Data analysis (National Agricultural Worker Survey) shows, for example, that at least 30%—and possibly the majority—of farmworkers are likely to be at high risk for severe COVID-19. Due to lack of health insurance, a high proportion have never been screened and informed they might be high-risk. This screening would better enable us to provide these advanced treatments to those high-risk individuals who have had close contact with infected persons. Such screening should, ideally, be accompanied with intensive public messaging about the need for high-risk individuals to seek immediate treatment (within 5 days from becoming symptomatic or, ideally, even more rapidly).

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53      Chidambaram 2022. Over 200,000 residents and staff in long-term care facilities have died from COVID-19. Kaiser Family Foundation. https://www.kff.org/policy-watch/over-200000-residents-and-staff-in-long-term-care- facilities-have-died-from-covid-19/

F2.     Consider implementing ventilation standards into building codes, especially in public spaces where masks are not typically worn indoors (e.g., restaurants). These standards could be applied to future buildings and establish a process for retrofitting older ones. Poor ventilation in buildings has been repeatedly tied to increased transmission of respiratory pathogens. Improved air flow and filtration systems can dramatically reduce the risk of transmission in indoor settings. The implementation of ventilation standards in new buildings (and gradual retrofitting of older buildings) would contribute to California's pandemic preparedness by reducing the potential for indoor transmission of respiratory pathogens.[17]

F3.     Funding to train government officials, scientists, and community leaders in messaging and public communication. Part of the challenge stemmed from scientists and medical professionals who were not able to create messages and effectively communicate their knowledge—and especially the limitations to their knowledge—to politicians, public health officials, and the broader public.[54,55] Additionally, the lack of coherence in messaging from government and community leaders worsened the situation.[56]There are a variety of well-supported strategies and best practices for more effective health crisis communication[57] Such initiatives might include training career scientists in the development of op-eds or communication workshops targeted at students and early- career professionals. Providing a wide range of trusted leaders with messaging and communication training in advance of the next pandemic would contribute to more coherent and effective communication about public health risks and scientific uncertainties, resulting in more public trust in public health guidance, and in turn, greater compliance with public health safety measures.[58]

F4.     Allocate $4 million of funding for professional education associations to build their memberships' involvement in vaccination promotion. This recommendation is

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54      Paek and Hove 2020. Communicating uncertainties during the COVID-19 outbreak. Health Communication 35:1729-1731.

55      Covello 2003. Best practices in public health risk and crisis communication. Journal of Health Communication: 148-151.

56      Sharfstein et al. 2021. Uncoupling vaccination from politics: a call to action: https://doi.org/10.1016/S0140- 6736(21)02099-7

57      Goldstein et al. 2020. Science communication in the age of misinformation. Annals of Behavioral Medicine 54:985-990.

58      Bollyky et al. 2022. Pandemic preparedness and COVID-19: an exploratory analysis of infection and fatality rates, and contextual factors associated with preparedness in 177 countries, from Jan1, 2020, to Sept 30, 2021. The Lancet. https://doi.org/10.1016/S0140-6736(22)00172-6

focused both on 1) promoting more extensive local education systems' participation in vaccination campaigns[59] and 2) providing training/technical assistance to enhance school administrators', principals', teachers', and instructional aides' messaging to parents about the rationale for ensuring all vaccine-eligible children are fully vaccinated—including boosters when appropriate. Teachers and other public education professionals have frequent interactions with large numbers of people within their communities. Their connections to these large "social networks" means they could be effective distributors of information. Recruitment of strategically placed allies (e.g., such as those with large social networks) to share targeted health messaging has proven to be a powerful strategy for encouraging behavioral change.[60,61] There is a significant body of relevant research on effective messaging but there remain challenges in translating this knowledge into effective practices that build on the close relationships that educators have with parents. A particularly important example of this is where adult education programs—some at community colleges and some in K-12 districts—have strong relationships and daily interactions with immigrant adult learners. These associations could include the Association of California School Administrators (ACSA), the California Teachers' Association (CTA), California Council for Adult Education (CCAE), and professional networks serving vulnerable populations such as those that are part of the Migrant Education Program and bilingual education.

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59      The CDC advocates for schools to engage proactively with vaccination efforts: National Center for Immunization and Respiratory Diseases 2021. How schools can support COVID-19 vaccination. https://www.cdc.gov/vaccines/covid-19/planning/school-located-clinics/how-schools-can-support.html

60      Latkin and Knowlton. 2015. Social network assessments and interventions for health behavior change: a critical review. Behavioral Medicine 41:90-97.

61      Petit 2019. The behavioral drivers model: a conceptual framework for social and behavior change programming. United Nations Children's Fund (UNICEF). https://www.unicef.org/mena/media/5586/file/The_Behavioural_Drivers_Model_0.pdf%20.pdf

# Appendix A:
## Prioritization Scheme and Justification

Assembled by Dr. Michael Kleeman, Chair of the CCST COVID-19 Steering Committee

| Recommendation | Imminently Actionable? | ROI* | Top 6? |
|---|---|---|---|
| A1: Allocate funding to CDPH to improve the primary health service networks (including and in addition to Federally Qualified Health Centers and telehealth programs, the latter of which have played an important role in disaster response) to ensure that all Californians have good primary care and rapid access in emergent situations. | **Yes** Funding allocation to CDPH can be done quickly. Proper distribution to front line agencies will take more time. | High | |
| A2: Direct funding to the Division of Communicable Disease Control (DCDC) at CDPH. | **Yes** | Med. | |
| A3: Direct funding to the Emergency Preparedness Office (EPO) at CDPH. | **Yes** | Med. | |
| A4: Funding to hire and/or train dedicated communications staff (e.g., public health information officers) to manage and deliver emergency messaging at public health agencies. | **No** Time to recruit, hire, and train | Med. | |
| A5: Funding to establish a communications coordinating role across public health and emergency management agencies. | **Yes** Quick hire, but will agencies cooperate? | High | |
| A6: Funding to create public-private partnerships that can connect public health officials with communication professionals. | **No** Good idea but complicated and little track record of success | Med. | |
| B1: Funding for building and maintaining a network of partner organizations who are trusted nodes in higher risk communities; such partners may include nongovernmental organizations and religious institutions. | **Yes/No** Some of this is already underway but not broadly based or systematic | High | Yes |
| B2: Develop a framework for the rapid assessment of vulnerability and high-risk groups in California—e.g., based on geography, race/ethnicity, language, and literacy | **No** Takes time and may be disease dependent | Med. | |
| B3: Funding for identifying effective messaging among different subpopulations | **No** Important but complex given number of subpopulations | Med. | |
| B4: Allocate $20M for First 5, Head Start, and Migrant Head Start programs (on the basis of competitive proposals) for conversations and vaccination events with parents in the lowest quintile of census tracts (as measured by vaccination rates). | **Yes** | High | |

*Return on Investment (ROI): High, Medium, Low

| Recommendation | Imminently Actionable? | ROI* | Top 6? |
|---|---|---|---|
| C1: Allocate $5M for a comprehensive private/public process supported by the academic community to define what IT-enabled capabilities should be deployed and how these should best be developed and operated/supported. | **Yes**<br>Preliminary discussions have been held and this could be done in 6 months | High | Yes |
| C2: Require that all infectious disease reporting to county and state health departments and the patient care facilities be done digitally and as close to real time as possible. | **Yes**<br>Some providers have already complied. Complication with State and County systems | High | Yes |
| C3: Explore the potential for requiring syndromic surveillance and clinical (symptoms) data collection. | **Yes**<br>This could be quickly done but requires cooperation of multiple parties | Med. | Yes |
| C4: Consider pursuing information infrastructure that incorporates syndromic data, social media, internet search information, etc., to facilitate better situational awareness. | **No**<br>Complex number of players and systems, but could be part of C1 | Med. | |
| C5: Implement information infrastructure that facilitates bi-directional data exchange and the most seamless and timely integration possible of hospital and provider data with public health data. | **No**<br>Once data systems are in place this would be relatively simple | High | |
| C6: Develop and implement regular, independent, and metrics-based review of California's pandemic readiness by convening an expert independent panel. | **No**<br>Important but organizationally complex | High | |
| C7: Leverage contact tracing and case investigation efforts to a) enhance data collection and b) connect impacted individuals and households in disadvantaged communities to social services to support isolation and quarantine. | **No**<br>Could be built into other systems identified | High | |
| C8: Bolster efforts to make public health information more easily accessed by the public and more visually engaging. | **No**<br>This will take time and work with partners to ensure effective outputs | High<br>Esp. if it alters public behaviors for better | |
| C9: Pursue more capable IT infrastructure, including online sites that have more routine functionality such that in the event of the next public health emergency, existing online IT infrastructure can be readily adapted rather than designed de novo | **No**<br>But could be incorporated into the planning task C1 | Med.-High | |
| C10: Develop a unified pathogenic wastewater surveillance system. | **No**<br>Questionable value except in hyper local situations | Low | |
| D1: Funding to expand California's long COVID-19 clinics. | **Yes**<br>Existing facilities | Med. | |
| D2: Partner with internet providers to offer expanded free internet access to at risk populations. | **Yes**<br>Funding can be diverted from other Broadband efforts | Low | |
| D3: Increase funding for evidence-based suicide prevention strategies and services. | **No**<br>Important but long lead time to execute | Med. | |

| Recommendation | Imminently Actionable? | ROI* | Top 6? |
|---|---|---|---|
| E1: Funding for developing the infrastructure for rapidly implementing an ongoing, survey of pandemic-related public attitudes. | **No**<br>Takes a long time and may not yield desired impacts of change | Low | |
| E2: Funding to develop methods for combating misinformation and disinformation campaigns. | **No**<br>Important but underway in many other places | High | Yes |
| E3. Allocate $2M for improved investigation and reporting regarding workplace outbreaks of COVID-19. | **No**<br>Best if integrated with CAL-OSHA and other agencies for execution | Med. | |
| E4. Allocate $2M for improved data/research on vulnerable populations including undocumented immigrants and prison populations. | **Yes**<br>Research proposals could be received within 6 months | Med. | |
| E5. Allocate $1.5M to study the successes and failure modes in serving the full cycle of citizen needs at the local level during the COVID-19 pandemic. | **Yes**<br>Some of this work has already begun in California and elsewhere | Med.-High | |
| E6. Allocate $1M for assessment of conditions in detention facilities for immigrants, and corrective action as necessary. | Assessment – **Yes**<br>Corrective action - **No** | Med. | |
| E7. Assess conditions across California's nursing homes and other long-term care facilities and develop solutions to systemic challenges and better mitigate risks. | **Yes** | High | |
| F1: Implement a statewide initiative to provide universal screening for COVID-19 vulnerability and the ability to mobilize this capability for other infectious diseases that may lead to a pandemic. | **No**<br>Highly complex to execute across the State | Med.-Low | |
| F2: Implement ventilation standards into building codes, especially in public spaces where masks are not typically worn indoors (e.g., restaurants). | **Yes**<br>Code changes can be simple but often take much time | Med.-High | |
| F3: Funding to train government officials, scientists, and community leaders in messaging and public communication. | **Yes** | Med.-High | Yes |
| F4: Allocate $4M in funding for professional education associations to build their memberships' involvement in vaccination promotion. | **Yes** | Low | |

# Appendix B:

## Corresponding Provisions in the Proposed 2022-23 Budget

**4265-021—For support of State Department of Public Health, 4040010-Emergency Preparedness (COVID-19 State of Emergency Funding)**

B2: Develop a framework for the rapid assessment of vulnerability and high-risk groups in California—e.g., based on geography, race/ethnicity, language, and literacy.

C7: Leverage contact tracing and case investigation efforts to a) enhance data collection and b) connect impacted individuals and households in disadvantaged communities to social services to support isolation and quarantine.

E1. Funding for developing the infrastructure for rapidly implementing an ongoing, twice monthly, state-wide social and behavioral survey of pandemic-related public attitudes that is representative down to the county-level.

E3. Allocate $2 million for improved investigation and reporting regarding workplace outbreaks of COVID-19.

E4. Allocate $2M for improved data/research on ultra-vulnerable populations including undocumented immigrants and prison populations.

E6. Allocate $1M for assessment of conditions in detention facilities for immigrants, enforcement, and corrective action as necessary.

F1: Implement a statewide initiative to provide universal screening for COVID-19 vulnerability and the ability to mobilize this capability for other infectious diseases that may lead to a pandemic.

## 4265-001—For support of State Department of Public Health, 9900100-Administration

A5: Funding to establish a communications-coordinating role across public health and emergency management agencies.

## 4265-001—For support of State Department of Public Health, 4040-Public Health Emergency Preparedness

A3: Direct funding to the Emergency Preparedness Office (EPO) at CDPH.

C6: Develop and implement regular, independent, and metrics-based review of California's pandemic readiness by convening an expert independent panel. As part of this regular review, no less than annually, test the response system using live scenario exercises.

E5. Allocate $1.5M to study the successes and failure modes in serving the full cycle of citizen needs at the local level during the COVID-19 pandemic.

## 4265-001—For support of State Department of Public Health, 4045-Public and Environmental Health

A2: Direct funding to the Division of Communicable Disease Control (DCDC) at CDPH.

A4: Funding to hire and/or train dedicated communications staff (e.g., public health information officers) to manage and deliver emergency messaging at public health agencies.

**B1: Funding for building and maintaining a network of partner organizations who are trusted nodes in higher risk communities; such partners may include nongovernmental organizations and religious institutions.

B4: Allocate $20M for First 5, Head Start, and Migrant Head Start programs (on the basis of competitive proposals) for conversations and vaccination events with parents in the lowest quintile of census tracts (as measured by vaccination rates).

C8: Bolster efforts to make public health information more easily accessed by the public and more visually engaging.

C9: Pursue more capable IT infrastructure, including online sites that have more routine functionality such that in the event of the next public health emergency, existing online IT infrastructure can be readily adapted rather than designed de novo.

C10: Develop a unified pathogenic wastewater surveillance system for California and require that all reporting be submitted to the California Department of Public Health.

D3: Increase funding for evidence-based suicide prevention strategies and services, including enhanced screening and tracking for depression, anxiety, substance use disorders, and suicidality.

E7. Assess conditions across California's nursing homes and other long-term care facilities and develop solutions to systemic challenges and better mitigate risks.

F4: Allocate $4M in funding for professional education associations to build their memberships' involvement in vaccination promotion.

The following 5 recommendations relate specifically to provision 5: $235,161,000 shall be available to support the maintenance and operation of information technology systems including, but not limited to, systems established during the COVID-19 pandemic.

**C1: Allocate $5M for a comprehensive private/public process supported by the academic community to define what IT-enabled capabilities should be deployed and how these should best be developed and operated/supported.

**C2: Require that all infectious disease reporting to county and state health departments and the patient care facilities be done digitally and as close to real time as possible. This

will also necessitate that all county and state health departments are equipped to receive electronic reports.

**C3: Explore the potential for requiring syndromic surveillance and clinical (symptoms) data collection and reporting by appropriate parties including community organizations, pharmacies, schools, etc.

C4: Consider pursuing information infrastructure that incorporates syndromic data, social media, internet search information, etc., to facilitate better situational awareness.

C5: Implement information infrastructure that facilitates bi-directional data exchange and the most seamless and timely integration possible of hospital and provider data with public health data.

## 4260-001—For support of State Department of Health Care Services, 3960-Health Care Services

A1: Allocate funding to DHCS to improve the primary health service networks (including and in addition to Federally Qualified Health Centers and telehealth programs, the latter of which have played an important role in disaster response) to ensure that all Californians have good primary care and rapid access in emergent situations.

## 7760-001—For support of Department of General Services, 6320028-Building Standards Commission

F2: Consider implementing ventilation standards into building codes, especially in public spaces where masks are not typically worn indoors (e.g., restaurants). These standards could be applied to future buildings and establish a process for retrofitting older ones.

## For the following six recommendations, we were unable to determine which agencies and programs would/do have jurisdiction over the following recommendations:

A6: Funding to create public-private partnerships that can connect public health officials with communication professionals including news agencies, journalists, producers, as

well as TV, film, and social media industries to develop effective science communication and messaging campaigns.

B3: Funding for identifying effective messaging among different subpopulations. D1: Funding to expand California's long COVID-19 clinics.
D2: Partner with community organizations and internet providers to offer expanded free internet access to isolated and disproportionately impacted populations.

\*\*E2. Funding to develop methods for combating misinformation and disinformation campaigns.

\*\*F3: Funding to train government officials, scientists, and community leaders in messaging and public communication.

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Stanford University
University of Southern California

NASA's Ames Research Center
NASA's Jet Propulsion Laboratory
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Sandia National Laboratories
SLAC National Accelerator Laboratory

CALIFORNIA POLICY ACTIONS FOR
PANDEMIC PREPARATION, RESPONSE, AND RECOVERY:
Initial Recommendations

White Paper
California Council on Science and Technology • May. 2022

STRONGER WITH SCIENCE FOR 35 YEARS

# CCST
## CALIFORNIA COUNCIL ON SCIENCE & TECHNOLOGY

**MAKING CALIFORNIA'S POLICIES STRONGER WITH SCIENCE AND TECHNOLOGY SINCE 1988**