Reimagining a 21st Century Public Health System

Workshop Proceedings

Prepared by **Third Plateau Social Impact Strategies**
for workshops held June 14 & 17, 2022.

COVID-19 Illustration: CDC

CCST
CALIFORNIA COUNCIL ON
SCIENCE & TECHNOLOGY

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Third Plateau

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Executive Summary

On June 14th and 17th, the California Council on Science and Technology (CCST) welcomed 35 leading public health experts to a virtual workshop on *Reimagining a 21st Century Public Health System*. Participants were asked to reflect on their experiences throughout the COVID-19 pandemic and tasked with the challenge of producing actionable, holistic, and equity-centered recommendations for California's policymakers.

Participants reflected on six focus areas, based on groups of interrelated activities that occur in response to an emerging infectious disease that threatens public health: 1) biosurveillance, outbreak detection, and early warning systems; 2) case reporting, contact tracing, and containment; 3) data infrastructure, analytics, modeling, and forecasting; 4) media and crisis communications; 5) dispensing and administering medical countermeasures; and 6) provisioning of care and treatment.

Across breakout discussions and focus areas, participants identified seven cross-cutting capabilities of an ideal public health system:
1. Cross-sector collaboration and partnerships
2. Enabling policy and legal environment
3. High quality data and data standards
4. Effective communication
5. Equity- and user-centered design
6. Skilled workforce and training
7. Culture of community trust and wellbeing

Action steps that would support these 7 capabilities, as well as other capabilities of an "ideal public health system" are enumerated within.

These workshop proceedings serve as an archive of the discussions. As such, the recommended action steps, descriptions, and statements within have been validated by workshop participants, including CCST's COVID-19 Steering Committee, but have otherwise not been formally peer-reviewed, nor expanded upon.

Policy recommendations derived from this workshop will be further developed with the COVID-19 Steering Committee and released later this fall. These forthcoming recommendations will be peer-reviewed and informed by engagement with a broader selection of relevant stakeholders.

Workshop Context

As part of its [Disaster Resilience Initiative](#) in 2021, the California Council on Science and Technology (CCST) invited a group of interdisciplinary experts to join the CCST [COVID-19 Steering Committee](#) to help CCST provide guidance on how California could best prepare for the next public health crisis. For the last 18 months, CCST and the COVID-19 Steering Committee have convened California policymakers, researchers, and practitioners to understand challenges faced in responding to the COVID-19 pandemic. The group emerged from these discussions with the idea to focus recommendations on improving the institutional infrastructure required to effectively engage the broader public health ecosystem in responding to an emerging public health threat.

Workshop Objectives

On June 14th and 17th, CCST hosted a workshop to envision what a more holistic and inclusive portrait of our public health system might look like. Participants were asked to consider the public health system beyond local, county, state, and federal public health departments, with a particular focus on the important roles that could be (and are) played by non-traditional actors such as schools, pharmacies, faith-based institutions, and community-based organizations. Participants reflected on six focus areas for public health, based on groups of interrelated activities that occur in response to an emerging infectious disease that threatens public health:

- Biosurveillance, Outbreak Detection, and Early Warning Systems
- Case Reporting, Contact Tracing, and Containment
- Data Infrastructure, Analytics, Modeling, and Forecasting
- Media and Crisis Communications
- Dispensing and Administering Medical Countermeasures
- Provisioning of Care and Treatment

Reflecting on their background and experience with the COVID-19 pandemic, workshop participants were asked to consider the following questions for each of the focus areas:

- What would the ideal public health system be capable of doing, and who would be involved?
- Which of these capabilities does the system not currently support, and which are most important to build?
- How might we change the public health system to support these capabilities?

Finally, participants were asked to consider multiple lenses, including:

- Non-traditional actors in the public health ecosystem
- Scale of response (local, county, state)
- Urban versus rural needs

Workshop Design

The two-day workshop began with opening remarks from Amber Mace, CEO of CCST, followed by a keynote conversation between Dr. Harvey Fineberg, President of the Gordon and Betty Moore Foundation, and Dr. Rohan Radhakrishna, Chief Equity Officer and Deputy Director of the

California Department of Public Health. The two leaders discussed lessons learned throughout the COVID-19 pandemic, and their visions for a 21st century public health system.

The remainder of the workshop was comprised of a series of small-group discussions facilitated by Third Plateau, a social impact strategy firm. In breakout groups, participants identified the ideal capabilities of the California public health system within their selected focus area. They also completed a prioritization exercise to select the top three capabilities they saw as most important to develop. On day two of the workshop, facilitators shared a synthesis of the breakout discussions with the entire group. Participants then completed a brainstorming exercise to identify initial action steps to build the capabilities that had been identified as top priorities.

Workshop Outcomes: Common Capabilities Across Focus Areas

Across breakout discussions and focus areas, participants identified seven cross-cutting capabilities of an ideal public health system. The overarching themes are summarized in the table below.

Ideal capability	Focus area
Cross-sector collaboration and partnerships The ideal public health system coordinates the detection, monitoring, evaluation, response/care, reporting, and data sharing related to public health threats. It is decentralized, though coordination is maintained by centralized leadership. The ideal public health system includes both traditional and non-traditional actors and breaks down silos between them. There are strong partnerships in place, including between providers and labs or researchers; the public, private, and civil society sectors; federal, state, and local agencies; and block-level community actors.	#1: Biosurveillance #2: Case Reporting #3: Data Infrastructure #5: Medical Countermeasures #6: Provisioning of Care and Treatment
Enabling policy and legal environment The ideal public health system cuts through regulatory red tape to reduce the barriers to rapid action in emergency times. Legal and policy frameworks include standard operating procedures, workflows, and protocols that allow key partners to coordinate efforts in tracing, notifying, containing, dispensing, vaccinating, etc. There is clear local legal authority and universal jurisdiction-level guidelines, supported by capable leadership. Liability protections and privacy standards are effectively managed to enable rather than inhibit rapid response.	#1: Biosurveillance #2: Case Reporting #3: Data Infrastructure #4: Media and Crisis Communications #5: Medical Countermeasures
High quality data and data standards The ideal public health system uses a rapid, real-time, open, and integrated electronic data system that allows for data collection, sharing, and reporting across the state, including with non-	#1: Biosurveillance #3: Data Infrastructure #4: Media and Crisis Communications

traditional actors. It is based on common, regularly updated data standards and definitions that are FAIR (Findable, Accessible, Integratable/Interoperable, Reusable), and it employs easy-to-understand data visualizations.	● #5: Medical Countermeasures
Effective communication The ideal public health system communicates clear, unified, actionable information. Information flows efficiently from non-partisan, trusted sources, across diverse populations and institutions/sectors, and in multiple languages and on multiple platforms. Messages account for what is known and unknown and respond to specific phases of emergencies, adapting in real time as needed.	● #1: Biosurveillance ● #2: Case Reporting ● #4: Media and Crisis Communications
Equity- and user-centered design The ideal public health system is equitable and designed for those disproportionately impacted by public health crises. It is user- and patient-centered, with consideration of people's culture, language, and other population- specific considerations. This is supported by a public health workforce that reflects the diverse communities it serves, including multiple trusted community ambassadors and local messengers. The system responds to in-the-moment needs as well as addresses inequities in non-emergency times.	● #2: Case Reporting ● #4: Media and Crisis Communications ● #5: Medical Countermeasures ● #6: Provisioning of Care and Treatment
Skilled workforce and training The ideal public health system has a professionally trained, certified, and supported long-term workforce that is prepared to respond to emergencies at all times. These individuals can be readily referred and deployed, especially during surges and to high-risk or high-need communities. Their training covers data collection, tracking, and interoperability and media/crisis response. This workforce includes both competitively paid staff as well as volunteers, all of whom are supported by safety standards and measures to prevent burnout.	● #2: Case Reporting ● #3: Data Infrastructure ● #5: Medical Countermeasures ● #6: Provisioning of Care and Treatment
Culture of community trust and well-being The ideal public health system is embedded within a culture that centers community health and collective well-being. It is supported by a media-, science-, and data-literate public, with the ability and tools to pre- and debunk mis/disinformation. There is low blame and stigma, as well as ongoing, behavior-focused public health dialogue and awareness.	● #1: Biosurveillance ● #4: Media and Crisis Communications

Additionally, throughout the workshop, participants repeatedly noted that many of the capabilities they identified, as well as the action steps needed to achieve them, have been proposed for decades. Participants shared that many of the solutions they discussed exist in design form or have been implemented in smaller jurisdictions (i.e., individual counties or departments), but have not been successfully executed on a large scale. They underscored the need for significant collaboration and funding for widespread adoption and effective execution.

Workshop Outcomes: Capabilities and Action Steps By Focus Area

The following summarizes the ideal capabilities for each focus area identified by participants, as well as proposed action steps for the top three capabilities.

Focus Area #1: Biosurveillance, Outbreak Detection, and Early Warning Systems

The Biosurveillance, Outbreak Detection, and Early Warning Systems session focused on the continuous activities that help detect and counter public health threats before they become emergencies. Within this focus area, participants identified the following ideal capabilities and proposed action steps for the top three capabilities.

1. **Cross-sector collaboration**: The ideal public health system coordinates detection, monitoring, evaluation, response, and reporting across multiple sectors, including academia, business, health, social services, wastewater, and more. It includes an automated statewide health information exchange system that can send alerts to both health departments and private providers. It must also be capable of detecting novel pathogens in high-risk communities and among travelers from hotspot areas.

   Action steps:
   - Develop a transparent legal framework that clarifies what providers are allowed to share (e.g., information, data, and samples) with whom in times of crisis.
   - Develop use case scenarios that inform the elements and informatics that policy/tech staff will need to use data. Rethink and codify data standards for each part of the sector to facilitate data sharing.
   - Create incentives for cross-sector collaboration (e.g., by linking reporting and/or interface standards to funding) and address disincentives to reporting.
   - Create incentives to encourage facilities, agencies, etc. to participate in surveillance systems.
   - Identify a centralized coordinator to facilitate cross-sector collaboration, ideally outside of the clinical setting so that clinicians can focus on care.
   - Link data to actions, such as recommendations for mask mandates, vaccines, etc.
   - Train staff at public health departments to have interoperability expertise (e.g., Chief Medical Information Officer with Health Information Exchange training).
   - Create a centralized system for the storage of laboratory samples that is independent of local testing facilities.
   - Provide funding to CDPH to purchase, develop, and maintain a new system that

is interoperable with the health care and social service delivery system.

2. **Supportive policy and administration**: The ideal public health system includes legal and policy frameworks that are consistent and aligned with national standards and practices as well as global standards and practices from the WHO and others. It also includes standard operating procedures and workflows that enable the transfer of information and treatment across institutions, as well as enhanced data, IT, and metagenomic analysis capabilities. Other important capabilities include sufficient training, infrastructure investments, and protocols to expedite action and reduce red tape in emergencies. These must be supported by leadership with the authority and competence to make quick, well-informed decisions.

   Action steps:
   - Take advantage of existing data streams (e.g., wastewater, air monitors in public spaces) with lower privacy concerns to understand community needs, especially when personal identifiers are not needed.
   - Establish emergency response systems ahead of time that can be deployed in times of crisis. Assess what policies and regulations (e.g., HIPAA rules) were waived during the COVID-19 pandemic to determine which might be automatically/temporarily waived in a state of emergency.
   - Establish systems that allow for some risk in data sharing when benefits outweigh potential costs.
   - Improve early detection systems to make them more sensitive and automated.
   - Use geocoded SMS data to develop rapid assessment heat maps to guide rapid response.
   - Where possible, engage non-traditional actors from outside the formal public health sector to identify innovative solutions.
   - Ensure systems support clinical care workflows, e.g., through the ability to define a patient population as "belonging" to public health, in the same way you might define your "panel" in an electronic health record to order labs, vaccines, prophylaxis, and treatment.

3. **High community trust & public compliance**: The ideal public health system fosters a culture that centers community health and well-being, as well as the needs of the most vulnerable. It is built on a foundation of trust in science, government institutions, and the media. This requires a public information system that is consistent, credible, and unified in its messaging and that leverages community-based communications strategies and messengers. Messengers should involve stakeholders beyond public health officials, including social scientists and local community leaders.

   Action steps:
   - Implement an Incident Command System for pandemics that includes key decision points and plans. Design and use practice drills during non-emergency times.

- Leverage community-based methods to solicit continuous input and feedback from key stakeholders.
- Coordinate data and communications centrally, e.g., through a Chief Medical Information Officer or Health Information Officer.
- Partner directly with community health organizations and leaders to adapt messages for regional interventions and communication campaigns that convey a consistent science-based message.
- Collaborate across sectors to identify and address knowledge gaps in public health, science, and media literacy.
- Ensure interoperability between the California Department of Public Health and the health care and social service delivery system to support detection, epidemiological analysis, clinical management, and communications at the individual and facility level.
- Conduct a cost-benefit analysis of policy actions to address public health emergencies during non-emergency times to inform future response.
- Design systems around the most vulnerable to ensure a more equitable response.

4. **Rapid, high-quality data**: The ideal public health system uses a rapid, real-time, open, and integrated electronic data system that allows for data collection, sharing, and reporting across the state, including with non-traditional actors. It should be capable of easy-to-understand data visualizations, such as heat maps or geotagging with stakeholders.

5. **Effective communication**: The ideal public health system communicates clear, actionable information in a way that is adaptive and responsive to real-time pivots. It allows for bidirectional communication between individuals/facilities and providers, as well as rapid notification of potential threats.

Focus Area #2: Case Reporting, Contact Tracing, and Containment

The Case Reporting, Contact Tracing, and Containment session focused on the activities that help control the spread of emerging public health threats. Within this focus area, participants identified the following ideal capabilities and proposed action steps for the top three capabilities.

1. **Automated case reporting and contact tracing systems:** The ideal public health system includes case tracking, reporting tools, and a data infrastructure that serve the varied needs of multiple partners and can be used across sectors. There are also clear and consistent policies for performing contact tracing and managing containment, as well as an automated close contact notification system.

    Action steps:
    - Review and update Chapter 4.1 in Title 17 in California's Code of Regulations to expand the required reporting elements and the groups required to report.

- Review and update laws to allow the sharing of case reports and surveillance data with other data analysts, researchers, and public health entities.
- Assess current case reporting and contact tracing procedures and workflows and identify elements that can be automated, simplified, or edited to center equity.
- Conduct an after-action report from community-based, non-governmental opinion leaders about the deficits during the COVID-19 pandemic that could be closed with automated systems.
- Revise systems to ensure they are compatible across local health departments, lab systems, and public health systems.
- Create a state registry (similar to immunization registry) that can be used for case tracking.
- Identify the needed workforce skills, then develop and conduct trainings to ensure staff are prepared.
- Make CalREDIE—a secure system used by the California Department of Public Health for electronic disease reporting and surveillance—accessible to all providers.
- Collaborate with Silicon Valley for technology development with the goal being something that could get past issues associated with HIPAA and electronic health record issues.

2. **Communications system that effectively reaches diverse populations:** The ideal public health system is capable of effectively communicating with diverse populations. This requires an understanding of diverse populations' needs, as well as the infrastructure to deliver messages in multiple languages. There is also a need for collaboration with trusted community ambassadors and local messengers. Finally, the ideal system enables efficient communication across agencies (i.e., county and state) and across platforms, and for structures that allow scientists to speak without threat from political leaders.

Action steps:
- Enhance messaging and communication to take into account the public's health literacy, as well as steps needed to reach culturally and linguistically diverse populations.
- Identify lessons from other countries and recent events. Evaluate successful contact tracing processes in other countries.
- Conduct a gap analysis of the communications capacity of the public health workforce to identify key competencies that must be developed. This could be informed by an after-action review in partnership with communities on the communication success and failures during the COVID-19 response.
- Plan for the ongoing integration of community-level health workers (e.g., *promotoras*—lay health workers that work in Spanish speaking communities) into public health emergency management system, as well as the standardization of community liaison positions in public health departments.

- Establish feedback loops between public health agencies and communities. These channels should enable communities to communicate their concerns and suggestions and for public health agencies to share regular reports and data.
- Create formal structures for collaboration between social scientists, public health experts, and community leaders on practical design elements of communications systems going forward.
- Provide more training for public health professionals on crisis communications and effective risk communication, including cultural competency and humility.
- Explore opportunities for mobile applications or other technologies to inform hard-to-reach populations about disease trends.
- Establish a task force focused on planning for congregate living situations (dormitories, senior living, prisons, etc.).

3. **Long-term skilled workforce:** The ideal public health system has a long-term (not temporary) workforce that is prepared at all times to do contact tracing and case investigation, with regular training and full staffing. This workforce is competitively paid and features support staff with expertise in data quality.

   Action steps:
   - Expand the CAL-EIS program—currently a 1-2 year program to prepare epidemiologists who hold at least a master's degree for public health leadership programs in California.
   - Establish career pathways for community partners to join the public health workforce, especially for those without Bachelor's or Master's degrees.
   - Create a centralized repository of trained workers with diversified skillsets to pull from when needed.
   - Expand the pipeline of potential case reporters and contact tracers to other institutions beyond exclusively public health schools and programs. This could be accomplished through partnerships with community colleges, Cal State, UC systems, CSUs, community colleges, and community-based organizations.
   - Connect with and leverage existing workforces who can be mobilized during pandemics, e.g., librarians, school nurses.
   - Design a professional trajectory for community health workers so there are opportunities for professional growth and career advancement.
   - Develop systems that allow for the rapid deployment of contact tracers and case reporters across geographies and jurisdictions in the event of surges.
   - Re-imagine the workforce from the current centralized county-level system to a neighborhood-level system where public health workers know specific families, clinicians, pharmacists, and healthcare providers.

4. **Enabling conditions:** The ideal public health system possesses sufficient laboratory capacity to accommodate testing needs during surges. It must also advocate for conditions that allow for the containment and halt of transmission, including time off from work for members of

the community who have been exposed or infected.

5. **Partnerships**: The ideal public health system has strong partnerships—supported by robust data infrastructure—between providers and labs to ensure smooth communication and rapid testing.

Focus Area #3: Data Infrastructure, Analytics, Modeling, and Forecasting

The Data Infrastructure, Analytics, Modeling, and Forecasting session focused on the acquisition, relaying, and analysis of data that enable the reporting, tracking, and management of the spread of public health emergencies. Within this focus area, participants identified the following ideal capabilities and proposed action steps for the top three capabilities.

1. **Privacy standards**: The ideal public health system defines information needs so that comprehensive standards around data collection can be established. The circumstances in which identifiability is required are known and clearly delineated. The ideal system would effectively manage permissions related to data use and communicate these standards to the public to cultivate trust around personal data use.

    Action steps:
    - Convene key stakeholders to develop comprehensive privacy policies that balance privacy and public health needs. These stakeholders should include experts in privacy-preserving technology, as well as legal and legislative teams.
    - Advocate for a national data privacy standard, rather than balkanized, local, regional, and state standards.
    - Identify key use cases for data collection and document the necessary workflows; determine which cases do and do not require identifiability and which cases require a mechanism for aligning an individual's data across different sources.
    - Evaluate current data access and revoke inappropriate access.
    - Define the level of re-identification risk that is acceptable in different circumstances.
    - Ensure local, state, and federal public health practitioners have a comprehensive understanding of HIPAA privacy rules, which are often misinterpreted as not allowing any sharing of public health data.
    - Use transparent communication to educate the public about the use of personal data, as well as the tradeoff between privacy and public benefit, to cultivate understanding and trust.
    - Assess the way data is moved across the broader public health system and identify opportunities to ensure security.
    - Engage with stakeholders to develop appropriate consent processes with respect to personal data sharing.

2. **Clear common data standards**: The ideal public health system establishes common definitions and terminology related to data and metrics to ensure a shared understanding

and language. Additionally, common data standards are developed and regularly updated, including clear guidelines for what data are collected, how variables are represented, and common practices for data entry. Data practices ascribe to FAIR principles (Findable, Accessible, Integrable/interoperable, Reusable). Finally, there is continual monitoring and transparency of algorithms.

Action steps:
- Identify a lead agency to drive common data standards efforts forward and serve as a locus of control. This must be an entity that has knowledge of data architecture and interoperability, as well as influence and funding.
- Involve key players across multiple sectors in the development of data standards to incorporate diverse perspectives. These key players may include:
  - Electronic Health Record (EHR) Vendors
  - California Health and Human Services (CHHS)
  - California Department of Public Health (CDPH)
  - Medi-Cal
  - Covered CA
  - Department of Mental Health (DMH)
  - Emergency Medical Services Authority (EMSA)
  - Data Infrastructure Engineers/Developers
  - Clinical Informaticists
  - Healthcare Providers
  - Patients
  - Community Representatives
- Engage the research community—who have more independence from financial outcomes—in modeling and analytics activities.
- Leverage existing resources:
  - Existing clinical vocabularies: SNOMED, RxNORM, LOINC.
  - Existing interchange formats: HL7, FHIR, Open mHealth.
  - Existing data models: OMOP, etc.
- Establish common structures and standards:
  - Refine and reach agreement on semantics, syntax, and documentation.
  - Explore the possibility of interoperability standards that go beyond the state system to encompass private entities.
  - Establish a Master Patient Index, a Master Facility Index, and a Master Provider Index to support interoperability, data matching, communications, and patient care.
  - Develop common standard categories for race and ethnicity that are more granular than OMB 1997 standards and that allow for multiple responses and/or free responses for race and ethnicity.
- Encourage participation in common standards by dispensing funding and other incentives, as well as disincentives for not participating. Build technology and systems to make adoption and use of standards as easy and efficient as possible.

- Petition the Office of the National Coordinator for Health Information Technology to create a list of required functionalities and/or certifications for public health surveillance system options to guide public health departments towards products that will support modern data exchange. Certifications would also provide infrastructure to support ongoing development and updates.
- When developing new systems and standards, create sandbox prototype systems to try out before committing to particular standards, vocabularies, and definitions.

3. **Integration**: The ideal public health system develops policy and technical methods that allow for the integration of disparate data sets, while taking into account workflows, how data are used, and what action should be taken as a result of data collected. There is also electronic interoperability between public health systems, pharmacies, healthcare providers, and hospitals.

Action steps:
- Convene stakeholders across sectors in a committee to identify the goals of integration, key outcomes, and definite critical highest priority use cases for integration, with granular mappings of actors, workflow, pre-conditions, etc. Operational leaders should agree with and support the goals of integration.
- Involve the following stakeholders in development and refinement of the data integration efforts: Office of the National Coordinator for Health Information Technology (ONC), Centers for Medicare & Medicaid Services (CMS), Center for Disease Control and Prevention (CDC), CHHS, CDPH, EMSA, CA's chief medical information officers in the healthcare delivery system, developers, and patient advisory boards.
- Identify a senior level state lead to drive data integration efforts forward and mandate widespread participation, as well as a team or system to address errors and bugs.
- Ensure relevant entities have widespread understanding of AB 133, California's common data sharing agreement for all state and local government agencies, health care delivery systems, and social service providers that receive public funding.
- Explore opportunities to coordinate data integration efforts at the national level to leverage other investments and economies of scale.
- Identify existing efforts, standards, and resources to leverage, including CA All Payer Claims Database (already building a Master Patient Index (MPI)), ONC's work on United States Core Data for Interoperability (USCDI) data elements and the Trusted Exchange Framework and Common Agreement (TEFCA), previous efforts for EHRs, and existing interoperability standards (e.g., FHIR, SMART-on-FHIR, CDS Hooks).
- The State of California should apply for CDC's Strengthening U.S. Public Health Infrastructure, Workforce, and Data Systems grant (CDC-RFA-OE22-2203) (part of the American Rescue Plan Act) to support data integration efforts.

4. **Usability:** The ideal public health system designs its data systems for use in real workplaces. This requires an understanding of workflows through the sector and an adjustment of data systems to function within these diverse settings. It is critical to consider opportunities to embed data collection and tracking processes within existing systems.

5. **Workforce knowledge of data:** The ideal public health system employs people with expertise in data exchange and fluency in data interoperability.

6. **Data visualization and modeling**: The ideal public health system supports data visualization and modeling capabilities at multiple levels of detail that meet multiple parties' needs, from local outbreak management to the modeling of statewide trends. The data user interface must allow for sorting and visualization along key parameters/categories so that users can access the specific data they need.

7. **Cross-data set and cross-sector collaboration**: The ideal public health system must support the breaking down of silos between sectors (e.g., zoonotic diseases and public health) and data sets. This requires formal structures to support regular cross-sector collaboration, as well as data-sharing agreements.

Focus Area #4: Media and Crisis Communications

The Media and Crisis Communications session focused on effective strategies and messengers for disseminating information to the public before, during, and after public health emergencies. Within this focus area, participants identified the following ideal capabilities and proposed action steps for the top three capabilities.

1. **Multiple messengers, with ongoing training and support:** The ideal public health system leverages many diverse and trusted messengers rather than a few experts. These include a range of health professionals (e.g., providers, officers, promoters); communications professionals (e.g., risk communicators, translators, social media strategists); and public figures (e.g., journalists, celebrities). Trusted messengers also include community-based spokespeople who are knowledgeable of local cultural contexts, such as state and local health department representatives, leaders of community-based organizations, and other local leaders. There is a professionally trained, certified, and supported workforce that is experienced in media training and they are cataloged in a database so they can be quickly referred and/or deployed to high-risk or high-need communities.

    Action steps:
    - Identify and train key players:
        - Recruit different messengers who can provide culturally appropriate messages in multiple languages, via multiple platforms.
        - Equip and train non-traditional messengers (i.e., those outside of healthcare) that already have inroads within their communities.

- Provide training and ongoing support:
  - Offer media training for public health officials, state and local government leaders, and non-traditional messengers.
  - Offer continuing education credits to incentivize appropriate training.
  - Supplement training with practice exercises to get messengers comfortable with information flows and pivots.
- Coordinate messages:
  - Disseminate key messages to a variety of messengers, who then can tailor to specific audiences and contexts.
  - Document the full chain of communication, from expert sources (e.g., medical professionals, scientists, and researchers) to on-the-ground messengers, and leverage the appropriate messenger for each message.
  - Organize a volunteer public health communications force of professionals, students, and community-based organizations who can push out key messages at key times.
  - Develop a central messaging body, including local officials and community leaders, that can share key messages and provide templates to be customized to local contexts.
  - Develop an action committee to build and grow partnerships with non-traditional actors (social media companies, entertainment, community leaders, etc.).
- Provide funding to monitor public opinion and track misinformation. Make this data accessible to local and state actors to guide actions and messaging campaigns.

2. **Rapid, clear, consistent messaging:** The ideal public health system is marked by consistent, unified messaging that is rapid, succinct, and easy to understand. Messaging during an emerging public health threat must flag for the public what is currently known and unknown, and forewarn the public about potential shifts in guidance as more is understood about the threat. The messaging should adapt to specific phases of emergencies and be action-oriented so that people do not tune it out. It must also be depoliticized and rooted in science and evidence. Finally, messages must be available on multiple platforms, in multiple languages, and accessible to diverse audiences.

   Action steps:
   - Provide ongoing training and support around all hazards training, not just within a pandemic.
   - Optimize the content and delivery of key messages:
     - Minimize the red tape on communications from public health departments.
     - Align on shared goals, e.g., to save a maximum number of lives.
     - Use anecdotes and stories, not just data.
     - Include a social media strategy.

- Be transparent and upfront about uncertainties, doubt, and new and emerging information. Acknowledge weaknesses to build public trust.
- Anchor messages in the "why," explaining how conclusions were reached.
- Prepare institutions (e.g., American Academy of Pediatrics, American Medical Association) to rapidly pre-bunk and correct information and to fill information vacuums proactively and quickly.
- Repeat consistent messages.
- Educate and support the media:
  - Offer training and support for newspaper editorial boards and other media, with a focus on how to identify and avoid perpetuating mis/disinformation.
  - Hold regular media briefings.

3. **Receptive culture that proactively addresses mis/disinformation:** The ideal public health system builds on a community culture and mindset rooted in common purpose and the collective good. The public must be media-, science-, and data- literate, trusting of public health and other institutions. They should be equipped with the tools and ability to "pre-bunk" mis/disinformation and to identify and counter bad actors. Communities should also reduce blame and stigma and promote healthy dialogue before, during, and after emergencies, with a focus on desired behaviors.

   Action steps:
   - Engage the public education system:
     - Prioritize public health education from the get-go, starting in the elementary and middle school years to ensure a strong foundation.
     - Include education around the scientific method so the public understands why public health messages may shift as new data and information emerge.
     - Invest in science education programs in K-12 and higher education.
     - Invest in ongoing, short media campaigns for the general public to enhance broader scientific literacy.
   - Engage tech companies in addressing mis/disinformation on social media platforms.
   - Follow well-established crisis communications best practices: Be first, be right, be credible.

4. **Ongoing research:** The ideal public health system is supported by just-in-time communications research. It is capable of monitoring and reporting community conversations across multiple media to check messaging effectiveness and uptake and to guide needed shifts in communications strategies.

Focus Area #5: Dispensing and Administering Medical Countermeasures

The Dispensing and Administering Medical Countermeasures session focused on activities

related to the distribution of medical countermeasures – those medical supplies that help diagnose, prevent, or mitigate illness, usually before someone becomes ill (e.g., vaccinations, diagnostic tests, personal protective equipment). Within this focus area, participants identified the following ideal capabilities and proposed action steps for the top three capabilities.

1. **Partnerships with non-traditional actors and distribution networks:** The ideal public health system is decentralized, though coordination is maintained by centralized leadership. In addition to traditional actors, trusted block-level public health actors are engaged in emergency response. These include local public agencies (Fire, EMS, Sanitation), community-based organizations, neighborhood phone trees, schools and universities, clubs (e.g., the Rotary Club and the Lions Club), etc.

    Action steps:
    - Create an operational playbook with policy and standard operating procedures that can be used for future situations. Review and update it at least annually with traditional and non-traditional actors.
    - Offer incentives and funding to promote engagement with partners outside of local health jurisdictions and public health departments.
    - Maintain a database of partners, key contacts, and location maps.
    - Actively engage with partners through non-emergency activities or training exercises throughout the year. Use these as opportunities for ongoing education and feedback and to establish and maintain relationships that can be quickly leveraged when needed.
    - Partner at the facility level, e.g., with schools and early education centers, workplaces (Cal/OSHA), departments of public social services, residential facilities (homeless shelters, etc.), prisons/jails, and mental health and healthcare facilities.
    - Assess critical legislative mandates/statutes that can be leveraged to require or encourage partnerships (e.g., those who must comply with public health mandates, funding requirements).
    - Take an equity approach, focusing on high-need or marginalized populations.
    - Conduct after action analyses with diverse stakeholders, e.g., community-based organizations, health facilities, pharmacies, health agencies, primary care physicians, federally qualified health centers.
    - Review financing structures (e.g., grants, contract mechanisms) to identify opportunities for collaboration/connection.
    - Actively maintain the California Health Corps.
    - Develop websites and digital resources ahead of time, rather than as bespoke items during an emergency.

2. **Non-bureaucratic policy and process:** The ideal public health system cuts through regulatory red tape to reduce barriers to immediate action. This is particularly necessary at the local level, with local legal authority and universal jurisdiction-level protocols for dispensing, vaccinating, and implementing other critical actions across key partners (e.g., pharmacists,

health officers, providers). There must also be essential liability protections and an assessment of competing interests across sectors.

Action steps:
- Conduct a comprehensive audit of public health policies and systems, checking for alignment between state and federal regulations, determining appropriate levels of authority in diverse settings/scenarios
- Revamp how Laboratory Field Services implements Clinical Laboratory Improvement Amendments (CLIA) regulations.
- Assess emergency waivers issued during the COVID-19 pandemic to evaluate which ones might be permanently legislated and which might be temporarily authorized in a state of emergency.
- Develop, regularly review, and maintain standardized "pre-approved" clinical and non-clinical protocols (e.g., who is authorized to vaccinate when surge capacity is needed, whether pharmacists can prescribe vaccines, pre-approved vendors eligible for funding or partnerships).
- Encourage state boards to adopt standards of care that are flexible, rather than specific regulations that limit training, services, etc.
- Establish cross-regional collaborative practice agreements so clinicians can be deployed to neighboring regions and people can more easily access care across regions.
- Conduct legal reviews related to liability protection to allow for critical care and encourage innovation (e.g., "Good Samaritan" laws that could apply to public health).
- Consult with other states (via National Conference of State Legislators, National Governors Association, etc.) on best practices and bright spots.
- Incentivize public-private partnerships and innovation (e.g., Washington's public health policy and contracting framework for public-private partnerships).

3. **Equitable and user-centered:** The ideal public health system is equitable and designed for those disproportionately impacted by public health crises. It is user- and patient-centered, with consideration of people's culture, language, and other population-specific considerations. The system should respond to in-the-moment needs as well as address inequities in non-emergency times.

Action steps:
- Identify and focus on high-need populations, such as low-income, housing insecure, Black, Latino, Pacific Islander, Indigenous, LGTBQ, and undocumented populations.
  - Incentivize support and service for high-need and high-risk populations.
    - Allocate funding for state health equity offices.
    - Attach grant/funding requirements to caring for high-need populations.

- Require publicly funded local health jurisdictions, health departments, local agencies, and community-based organizations to develop a "collaborative practice agreement" for disasters.
- Require counties to develop an equity plan that details how they will deploy PPE, vaccines, prophylaxis, treatment, etc. to those at highest risk or in healthcare deserts.
    - Identify healthcare deserts where communities cannot be reached by traditional healthcare (e.g., hospitals, clinics, pharmacies) and prioritize these areas for non-traditional models and partnerships.
- Build trusted alliances, communication lines, and resources within every sector and across communities.
    - Identify and partner with social service providers (community-based organizations, non-profit and non-governmental organizations, etc.).
    - Consider hiring partnership liaisons within public health departments.
    - Use community advisory groups.
    - Develop and maintain a directory of locations (e.g., churches, parks, rec centers) used during the COVID-19 pandemic that could continue to be engaged and utilized during future emergencies.
    - Build a pipeline of community health workers, *promotoras*, etc., and develop federal or state certifications.

4. **Integrated data and communications:** The ideal public health system uses an integrated data and communications system that is capable of rapid data entry and reporting and readily accessible to key public health actors. The communications system should be supported by effective marketing/PR, aligned to countermeasure deployments, and coordinated with communication experts. It must proactively respond to mis/disinformation about medical countermeasures.

5. **Ready supply chain:** The ideal public health system has a healthy supply chain of PPE, tests, vaccines, medications, and other essentials that can be readily deployed in emergencies. It strategically uses pharmacies and public-private partnerships to dispense, administer, and scale up medical countermeasures. There is local access to "standard" countermeasures as well as highly mobile resources and infrastructure to quickly and safely distribute new countermeasures.

6. **Ongoing training and education:** The ideal public health system has a trained, educated workforce that is capable of supporting the delivery of countermeasures, with multilingual, accessible resources.

Focus Area #6: Provisioning of Care and Treatment

The Provisioning of Care and Treatment session focused on the inpatient and outpatient treatment of those that have become ill, as well as those who require medical care for reasons

beyond an ongoing public health emergency. Within this focus area, participants identified the following ideal capabilities and proposed action steps for the top three capabilities.

1. **Structures for collaboration that break down silos:** The ideal public health system has an infrastructure that allows members of the health sector to organize and collaborate around common goals and messages. There are strong partnerships between public health agencies and providers, as well as public health agencies and local universities, to ensure efficient sharing of information and solutions. This is made possible by a data infrastructure that allows interoperability, such that public health workers and providers can access each other's data. Finally, there is transparency around the availability of supplies and resources to allow for flexible deployment in times of need.

    Action steps:
    - Develop policies that allow for the rapid mobilization and transfer of staff and resources, as well as flexibility of roles and responsibilities to respond to crises.
    - Provide credentialing that supersedes jurisdictional boundaries.
    - Establish partnerships between the health system and community organizations to effectively provide care to communities. Ensure that local providers (e.g., medical, pharmaceutical, testing, etc.) know local public health staff through regular ongoing collaboration.
    - Conduct regular joint public health emergency exercises.
    - Build relationships with high-risk communities in advance of a crisis to ensure trust and preparation.
    - Incentivize providers to participate in population health monitoring and reporting. Begin by addressing ongoing public health challenges, such as elder care, pregnancy health, and vaccination.

2. **Sustainable workforce:** The ideal public health system has a workforce that is trained and prepared to respond to crises. Staffing structures and levels are sufficient for responding to unexpected surges. This is accomplished in part through the ability to deploy staff across geographic regions in response to surging demand. There must also be a system-wide effort to address current provider burnout and measures in place to prevent future provider burnout. There must also be consistent safety standards for healthcare workers across the sector, from the availability and use of PPE to security to protect providers from harm.

    Action steps:
    - Increase pay rates and compensate workers for additional expertise (e.g., language and technical skills).
    - Establish consistent safety standards that protect workers from exposure and harm.
    - Train public health workers and healthcare providers on behavioral health, lifecourse issues, effective community engagement, data systems, and on a

variety of equipment to enable them to deliver care outside their area of expertise in a crisis.
- Create more professional classes of public health workers (e.g., community, surveillance, and regulatory health workers), and create more professional schools of public health.
- Establish a culture that values, supports, and incentivizes trainees holistically, and that celebrates a diversity of lived experiences.
- Develop structures and agreements that allow for the overnight transfer of funding and workers to respond to a crisis.

3. **Diverse representation throughout healthcare and public health systems:** The ideal health system employs staff of diverse backgrounds, identities, and lived experiences across all roles and career stages, such that the public health workforce reflects the communities it serves. This helps address the lack of trust among many communities of data and in public messaging. A representative workforce also fosters the equitable allocation of resources and information.

   Action steps:
   - Establish workforce conditions that attract and retain diverse staff by providing competitive pay, setting and monitoring progress towards diversity, equity, and inclusion (DEI) goals, identifying and mitigating bias, and providing resources to underserved communities (hospitals, pharmacies, etc.).
   - Use proven best practices to increase recruitment from communities with needed language skills and diverse lived experiences.
   - Allocate funding for the recruitment, training, and advancement of underrepresented populations.
   - Train existing providers on effective cross-cultural communication, as well as diversity, equity, inclusion, and accountability.
   - Recognize and reward mentors who support trainees from groups that are underrepresented in health care delivery.
   - Grow the pipeline of underrepresented talent by engaging young people to make them aware of and excited to pursue the varied job opportunities within the healthcare system. This could be accomplished by incorporating public health into the public school curriculum or providing high school level technical education degrees in public health.
   - Expand the availability of scholarships for underrepresented communities in healthcare and public health; include representatives from those communities on selection committees.

4. **Partnerships:** The ideal public health system thinks expansively about who is in the public health space and develops relationships and structures for collaboration in advance of a crisis. This involves collaborating with community partners who can quickly push out care to those in need, as well as leveraging the expertise of community organizations to effectively reach

historically underserved communities.

5. **Crisis Response:** The ideal public health system is ready at all times to respond to a variety of crises. It must be possible to deploy funding quickly in a crisis without procedural delays. There must also be the ability to deploy large numbers of staff to crisis locations overnight, with the capability to deliver care across geographic boundaries and with contracts already in place.

Closing Reflections

At the close of the symposium, participants were asked to share what they hope CCST will keep in mind moving forward. Highlights included:

- "I hope we will be able to ask policy makers not to politicize a non-political health concern like COVID-19 in the future."
- "If the audience is the Governor and the State Legislature, then we should focus on funding requests for staff, programs, data systems, etc. - that will then work on all the details we have outlined."
- "1. Data-driven policies, 2. Importance of including people from populations most affected by COVID/new health threats in decision making and leading an equitable response."
- "I hope that there will be greater investment in career pathways in public health, including community health workers, and early career professionals from diverse and under-represented minorities."
- "A systems-oriented multidisciplinary NTSB-like investigation of what went wrong at the international (e.g. WHO) and Federal levels concerning detection, declaration, preparation, and response to the COVID-192. A human-systems integration approach to understanding and addressing clinicians' burnout and security during a pandemic outbreak."
- "I'd be excited to see CCST make as public as possible their synthesis/ findings, op-eds, CalMatters pieces, convening other groups, meetings, being on local NPR stations, etc. and having a media advocacy strategy."
- "Anything we do has to be patient-centered at all times and keeping this from being tainted by business and political interests is the main challenge."

Next Steps

Policy recommendations derived from this workshop will be further developed with the COVID-19 Steering Committee and released later this fall. These forthcoming recommendations will be peer-reviewed and informed by engagement with relevant stakeholders. Additionally, some of the action steps proposed herein will inform future CCST workshops on public health.

Appendix A: Institutional Affiliations of Workshop Participants

American Medical Association
Boston University
California Department of Public Health
California Pharmacists Association
California Polytechnic State University
California State University Long Beach
Center for Emerging and Neglected Diseases, UC Berkeley
Center for Pandemic Preparedness, UC San Francisco
County of Santa Clara Public Health Department
County of Yolo Public Health Department
George Mason University
Johns Hopkins Center for Health Security
The Joint Commission
Lawrence Livermore National Laboratory
Los Angeles County Department of Public Health
Madera County Department of Public Health
National Center for Advancing Translational Science (NCATS)
Northwell Health	Long Island Jewish Hospital
Public Health Alliance of Southern California
RAND Corporation
San Francisco Department of Public Health
Santa Cruz County Health Services Association
Santa Cruz Public Health Department
Stanford University
Stanford University School of Medicine
UC Davis
UCSF
University of California Center for Climate, Health, and Equity
University of California, Berkeley
University of Michigan
University of Southern California