Executive Summary

Version History

Version #	Date	Notes
0.1	5/30/2024	First Draft submitted to CPR Team
0.2	6/4/2024	Final Draft revised per CPR Leadership review
0.3	6/14/2024	Final Draft revised per CPR Team review
0.4	8/9/2024	Final Draft revised per Expert Review and CPR Leadership re-review
1.0	2/10/2025	Final Draft submitted per CDPH Directorate review

Table of Contents

ES. Executive Summary

Note: Some abbreviations may be used interchangeably with their respective full spellings for ease of reading.

Introduction

The California Department of Public Health (CDPH) played a critical role in the ongoing response to and recovery from the COVID-19 pandemic, which was unprecedented in scope, size, and duration.

The COVID-19 pandemic was a public health emergency that challenged CDPH and its partners to respond swiftly, effectively, and equitably to protect the health and well-being of Californians. The pandemic also highlighted the strengths and gaps of California's existing public health system and offered opportunities for improvement and innovation.

CDPH commissioned this report to capture the key response activities, strengths, and lessons learned associated with its COVID-19 pandemic response. The After Action Report (AAR) provides a historical record and a learning tool for future public health emergencies. This document summarizes the key activities, accomplishments, and lessons learned by CDPH during the COVID-19 response from late 2019 through the summer of 2023. It is not a comprehensive or exhaustive account of all the activities and challenges that CDPH and its partners faced during the pandemic. Rather, it is a reflection of CDPH's commitment to continuous improvement, innovation, and excellence in public health.

Approach

Information-gathering for the AAR began in August 2021. The AAR team reviewed relevant documentation including State COVID-19 websites and dashboards, the Governor's COVID-19 Executive Orders, CDPH's COVID-19 Public Health Orders, guidance issued by CDPH and/or developed in collaboration with its State partners, public messages and press releases, emergency management policies and procedures, playbooks, and recovery plans. The AAR team also conducted interviews with over 440 subject matter experts (in discussion groups or individually) who participated in the response. Interviewees included State leadership, CDPH leadership, CDPH staff, and contractors who worked on the response. In addition, the team administered

surveys to obtain the perspective of Local Health Jurisdictions (LHJs), the Medical Health Operational Area Coordinators (MHOACs), and the Regional Disaster Medical Health Specialists (RDMHSs).

Overview

This Executive Summary provides an overview of the AAR and is organized as follows:

A. Timeline, Milestones, Accomplishments, Metrics, and Lessons Learned

B. Cross-Cutting Themes

C. Summary of Major Response Activities

D. Demobilization

CDPH conducted internal detailed analyses of many response areas.

A. Timeline, Milestones, Accomplishments, Metrics, and Lessons Learned

This section provides a high-level overview of key timelines, milestones, metrics, accomplishments, and lessons learned pertaining to CDPH's COVID-19 pandemic response. The Timeline and Key Milestones table present a chronological summary of the major events and activities that marked CDPH's COVID-19 response from the beginning of the pandemic through the summer of 2023. It includes the main milestones for each quarter, along with the corresponding significant event.

Timeline and Key Milestones

Timeline	Key Milestones
Winter 2019/2020	• **December:** CDPH's Medical and Health Coordination Center (MHCC) began receiving notifications of a novel coronavirus in China • **January 24**: CDPH activated the MHCC for COVID-19 • **January 26:** First two confirmed COVID-19 cases in CA • **January 30:** First U.S. travelers from China arrived and quarantined at military base in Riverside, CA • **January 31:** U.S. issued an Executive Order that limited travel from China • **February 3:** U.S. Department of Homeland Security directed all flights from China to 11 U.S. airports, including SFO and LAX • **February 5:** Additional U.S. evacuees from China arrived and quarantined at military bases in Southern and Northern California • **January – March:** CDPH's Outbreak Investigations Team began responding to outbreaks in jails, prisons, and other settings • **February 26:** First COVID-19 case through community transmission identified in California
Spring 2020	• **March:** Community transmission of COVID-19 began in California • **March 4**: Governor declared State of Emergency in California • **March 8:** Grand Princess cruise ship docked in Oakland • **March 13**: Many school districts across CA closed schools. Governor's Office issued Executive Order N-26-20 to continue State funding for schools in the event of physical closures • **March 16:** Multiple California local health jurisdictions in one region issued coordinated shelter-in-place orders, (the first in the United States) • **March 16:** CDPH issued guidance to prevent COVID-19 transmission • **March 17:** CDPH Returning Traveler Monitoring program discontinued • **March 19:** Governor's Office issued Executive Order N-33-20 (Stay-at-Home order) • **March 19:** State Public Health Officer issued Public Health Order (PHO) defining essential workers • **March 25:** Governor transferred $1.3 billion to the State's Disaster Response Emergency Operations Account

Timeline	Key Milestones
	(DREOA), a subaccount of the Special Fund for Economic Uncertainties (SFEU) • **March – April**: First Surge (Skilled Nursing Facility [SNF] Surge) • **March – April:** Multiple Executive Orders waived licensing and procurement regulations to increase staffing and supplies, and provide additional funding for surges • **March – May**: Governor's COVID-19 task forces created for testing, medical surge, and other areas • **April**: CDPH reported the need for 31,400 contact tracers and case investigators • **April 14:** Pandemic Resilience Roadmap modified the Stay-at-Home Executive Order • **April 27:** CDPH issued public health guidance for Project Roomkey sites • **May**: State contracted with vendors to increase polymerase chain reaction (PCR) testing capacity • **Mid-May:** Statewide contact tracing program (California Connected) and system (CalCONNECT) announced • **May 21:** Governor transferred $1.8 billion to DREOA • **May – June:** CDPH formed partnerships to pursue genomic surveillance for COVID-19 testing • **May – June**: Commercial PCR testing became more widely available
Summer 2020	• **June:** CalCAT (California COVID-19 Assessment Tool) for forecasting and projections launched • **June 18:** CDPH issued face coverings guidance • **June – August**: Second Surge (Hospital Surge) • **July – August:** Data volumes overwhelmed and destabilized CDPH's Statewide disease surveillance system • **August**: First U.S. case of reinfection reported • **August 26**: Governor announced contract with PerkinElmer to build a COVID-19 focused State laboratory • **August 31:** Blueprint for a Safer Economy launched • **August 31:** PHO established criteria for reopening under the Blueprint • **Late August**: FDA issued Emergency Use Authorization (EUA) for first rapid antigen test kit
Fall 2020	• **September – December:** CDPH formed wastewater surveillance team • **October**: Testing Task Force (TTF) began established additional PCR community-based testing sites • **October**: Western States Scientific Safety Review Workgroup launched to discuss vaccine safety

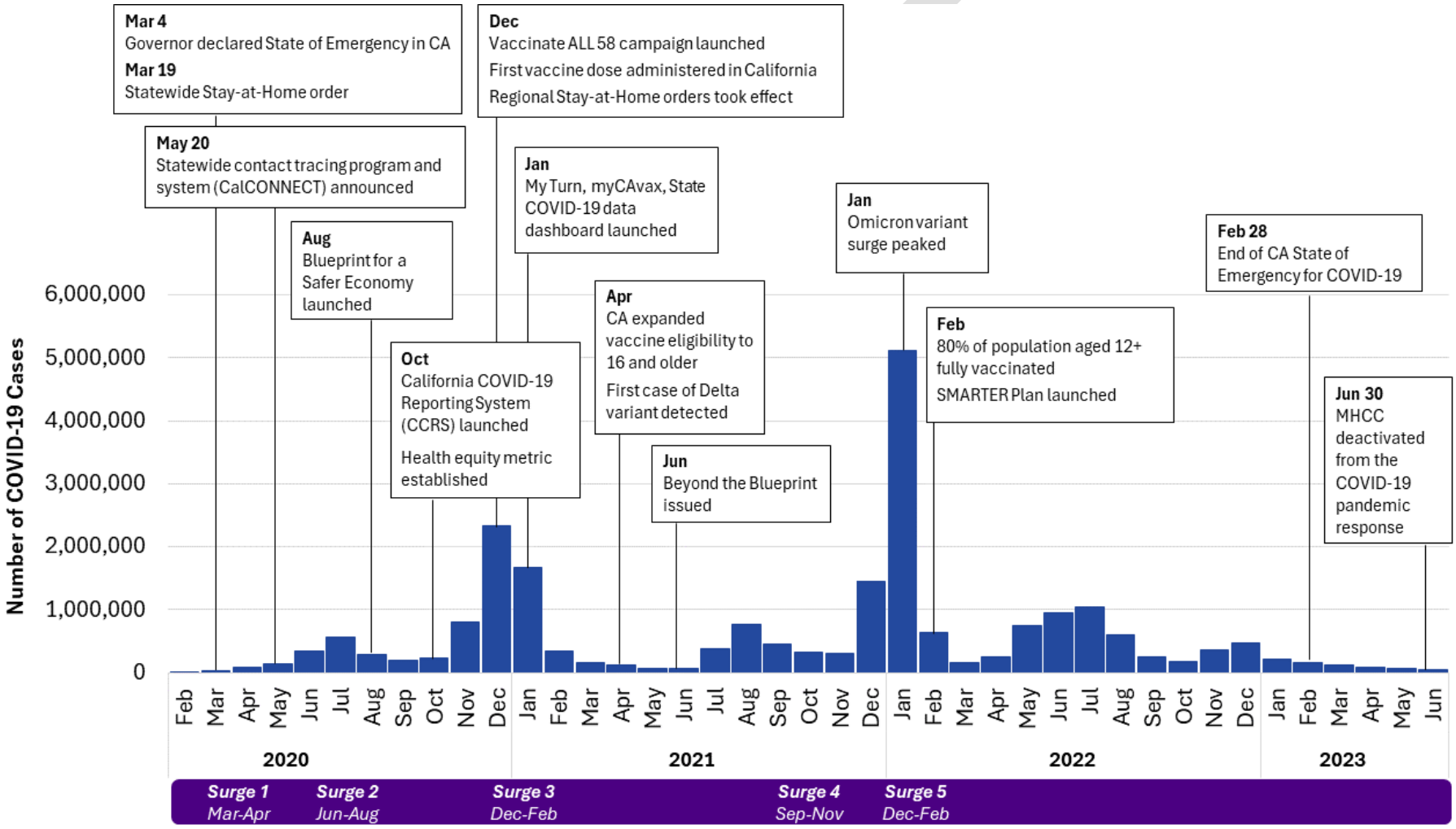
Timeline	Key Milestones
	• **October**: California COVID-19 Reporting System (CCRS) launched for electronic lab reporting gateway • **October 6:** Health equity metric for Blueprint established • **October 30**: Governor announced creation of Valencia Branch Lab (VBL) run by PerkinElmer • **November**: Drafting Guidelines Workgroup began meeting to discuss vaccination prioritization • **November**: Community Vaccine Advisory Group (CVAC) began meeting to provide community input on vaccine prioritization, vaccine equity, and vaccine communications • **November 5**: CalCONNECT Schools Portal for Outbreak Tracing (SPOT) launched • **November 16:** Emergency Brake instituted due to signs of Third Surge • **November 19:** Limited Stay-at-Home PHO took effect • **November 23**: Governor transferred $1.5 billion to DREOA • **December**: CA Notify (public-facing digital exposure notification system) launched Statewide
Winter 2020/2021	• **December:** First vaccine dose administered in California • **December**: Vaccinate ALL 58 campaign launched • **December**: California began vaccinating healthcare workers and long-term care residents • **December 5:** Regional Stay-at-Home orders took effect • **December – February**: Third Surge (Winter Surge) • **January:** My Turn (public-facing vaccine scheduling system) and myCAvax (vaccine management and ordering system) launched • **January**: PCR testing was piloted and then launched in schools • **January**: California began vaccinating essential workers • **January**: State COVID-19 Data Dashboard launched • **January 5:** Hospital Surge PHO to level load hospitals issued • **January 25:** All regional Stay-at-Home PHOs ended • **February**: Two mass vaccination sites launched in Los Angeles and Oakland with federal assets • **February**: Third-Party Administrator contract signed for vaccine distribution
Spring 2021	• **March**: Third-Party Administrator took over management for Statewide vaccine network • **March**: Let's Get to Immunity media campaign launched • **March:** Safe Schools for All initiative funded • **April**: California expanded vaccine eligibility to ages 16 and older

Timeline	Key Milestones
	• **April:** First case of the Delta variant detected in California • **April**: TTF launched first Statewide professional antigen testing program (in schools) • **May**: Vax for the Win incentive campaign launched • **May:** Vaccine Equity Campaign launched
Summer 2021	• **June 11:** Beyond the Blueprint PHO issued • **June 15:** Blueprint for a Safer Economy ended • **June 23:** Governor transferred $1.1 billion to DREOA • **June**: Digital COVID-19 Vaccine Records (DVR) System launched • **August 5:** Requirement for Healthcare Worker Vaccination issued • **August 16:** Hospital Surge PHO took effect • **August**: Equity Focused Outreach began
Fall 2021	• **September – November**: Fourth Surge (Delta Variant)
Winter 2021/2022	• **December:** 62 million vaccine doses administered at one-year anniversary of pandemic • **December**: First case of Omicron variant detected in California • **December – February**: Fifth Surge (Omicron Variant) • **January:** Omicron Variant Surge peaked • **January:** Wastewater analysis laboratory launched at the CDPH Drinking Water and Radiation Laboratory (DWRL) • **February**: 80% of population aged 12+ fully vaccinated • **February**: State released the SMARTER Plan (the next phase of California's COVID-19 response) • **February 24:** Governor transferred $2 billion to DREOA
Spring 2022	• **March:** Federal government launched nationwide "Test-to-Treat" initiative • **May:** CDPH established Office of Guidance and Policy • **May:** Optum Serve converted 146 testing sites to Test-to-Treat sites
Summer 2022	• **June:** Direct funding for schools program discontinued • **June:** CDPH took over management of State COVID-19 dashboards and associated data pipelines • **June 30**: Statewide redirected contact tracing workforce program ended • **July:** CDPH launched telehealth services for treatment
Fall 2022	• **August**: California declared a State of Emergency for mpox and incorporated mpox into MHCC response • **October**: TTF's Over-the-Counter (OTC) antigen testing program integrated with Test-to-Treat program
Winter 2022/2023	• **January:** Optum Serve Test-to-Treat sites closed

	• **January:** CDPH launched COVID-19 Therapeutics provider warmline • **February 28:** California's State of Emergency for COVID-19 ended
Spring 2023	• **March:** PCR lab network demobilized and PCR testing programs discontinued • **May 11:** U.S. State of Emergency for COVID-19 ended
Summer 2023	• **June 30:** MHCC deactivated from the COVID-19 pandemic response

The pandemic evolved in different waves and CDPH's response strategies adapted to the changing situation. Figure **ES-1** provides a visual overview of the COVID-19 pandemic in California, from the first reported case in February 2020 to the deactivation of the State's emergency response in June 2023. The figure shows the monthly case counts, surges, and the major response activities implemented by the State.

Figure ES-1: California COVID-19 Monthly Case Counts and Major Response Activities, February 2020 – June 2023



Accomplishments and Key Metrics

As detailed in this report, the following activities highlight some of the key accomplishments and metrics of CDPH's COVID-19 response. They showcase the efforts and achievements of CDPH and its partners in response functions such as testing, contact tracing, vaccination, healthcare capacity, public health guidance, data and reporting, communication, equity, and community engagement. These are not exhaustive, but rather illustrative of the breadth and depth of the response.

- CDPH and its partners significantly expanded healthcare facility space and staffing capacity to accommodate medical surges, creating novel strategies that can be replicated for future pandemics.
- CDPH showcased an innovative focus on health equity by applying health equity metrics and successfully implementing prioritized resource allocations and interventions in disadvantaged communities to encourage and promote COVID-19 testing, vaccinations, and therapeutics.
- CDPH established a robust community-based organization (CBO) network, which was used to address equity gaps, engage with traditionally underserved communities, and expand access to vaccines, testing, and other resources.
- CDPH established many new epidemiological surveillance projects that provided valuable data to help inform policy and decision-making. New initiatives ranged from clinical, hospitalization, and sero-surveillance projects to advanced approaches like whole genome sequencing and wastewater surveillance.
- CDPH built on academic and private partnerships to develop and maintain internal public health capacity to do complex analytics (including forecasting and projections) to inform public health policies and interventions.
- CDPH led the effort to build an extensive Statewide testing network, which resulted in administration of over 14 million polymerase chain reaction (PCR) COVID-19 tests. This infrastructure was leveraged to develop subsequent antigen testing programs, through which 25 million professional antigen tests were performed or allocated in community-based sites.

- CDPH rapidly expanded its infrastructure to successfully lead California's comprehensive COVID-19 vaccination program, which administered nearly 90 million doses through June 2023 and prevented hundreds of thousands of deaths and serious illnesses.
- CDPH processed unprecedented numbers of resource requests, which helped the State fulfill almost 2 billion individual resources to its local and regional partners throughout the COVID-19 pandemic.
- CDPH's Receiving, Storage, and Staging (RSS) warehouse distributed an unprecedented volume of essential supplies. In total, through November 2023, the RSS warehouse shipped out 260.5 million units to over 10,000 unique locations.
- CDPH and its State partners implemented several new major technology systems—CalCONNECT, CA Notify, myCAvax, My Turn, and the Public Health Ordering System. It also improved legacy data systems, informatics resources, and automated data reporting processes to process, disseminate, and visualize unprecedented volumes of COVID-19 data. This data was critical to leadership and enabled the State to make informed policy choices and decisions.
- CDPH built and maintained robust communications channels communicate with LHDs, healthcare providers, the public, and other stakeholders. These channels included recurring meetings and webinars, media campaigns, and public dashboards.

Key Lessons Learned

The COVID-19 pandemic introduced unprecedented challenges for CDPH and its partners. As the lead agency for California's health response, CDPH had to rapidly adapt to the evolving situation and implement effective strategies to protect the health and safety of Californians. In this section, we highlight some of the key lessons learned from the COVID-19 response, based on the insights and feedback from CDPH staff and stakeholders. These lessons reflect the successes, challenges, and best practices that emerged from the response and can inform future preparedness and response efforts.

Create a Resilient Response Center That Can Quickly Adapt to Changing Circumstances

For over three years, CDPH's Medical and Health Coordination Center (MHCC) was activated to respond to the COVID-19 pandemic. During this prolonged activation, it continuously evolved to meet changing pandemic needs and challenges. Early in the response, the MHCC focused on increasing staffing through redirections of CDPH and State staff and hiring contractors. Some CDPH staff relocated to the SOC or transitioned to remote work, while others remained onsite at CDPH's warehouse or in healthcare facilities across the State. The unprecedented scope and size of the pandemic necessitated a "whole-of-government" response, which was led by the Governor's Office (GO), the California Health and Human Services Agency (CalHHS), and the California Governor's Office of Emergency Services (Cal OES). California's response shifted in mid-2021 and other departments such as the California Department of Technology (CDT) and the California Government Operations Agency (GovOps) scaled back their involvement. CDPH reorganized the MHCC to bring all the various COVID-19 response teams under the MHCC organizational umbrella as part of a large, comprehensive Incident Command System (ICS) structure. The following year CDPH conducted extensive planning and organizational change management to prepare for demobilization and the transition of response activities into CDPH programs. Over this entire time, MHCC staff responded to multiple emergency activations and incidents in addition to COVID-19. These included two of the most destructive wildfire seasons, the national infant formula shortage, heat wave events, and Mpox. Throughout the COVID-19 response, CDPH and the MHCC successfully evolved to meet changing expectations and stakeholder needs to respond to the unique scope, duration, and severity of COVID-19.

Incorporate Equity In All Aspects of the Response

Every COVID-19 workstream had an equity component that was incorporated within its objectives, although the scope varied by response team. This prompted discussions on whether to focus on equity at the enterprise level and coordinate equity efforts across the entire response or to embed equity into individual response teams. CDPH leadership decided to adopt both strategies. In mid-2021, CDPH organized all the COVID-19 response teams underneath the MHCC umbrella and added an equity function to the MHCC's Management Section at the "command level". This new MHCC equity function was led by CDPH's Office of Health Equity to develop equity metrics, targets for reaching vulnerable populations, and ensuring that all response teams considered equity within their workstreams.

Provide Robust Data and Reporting

Early in the pandemic, access to timely data for decision making was a significant challenge. Over time, CDPH made substantial progress to establish robust data and reporting solutions to process large data volumes, integrate various data streams, meet new reporting requirements, and provide accurate, timely, and high-quality data. In addition, CDPH built detailed dashboards to inform a data-driven approach for decision-makers at different levels in State government, including the Governor's Office (GO), the California Health and Human Services Agency (CalHHS) and other State agencies, as well as to inform the public. The use of data in California's COVID-19 pandemic response led to a greater recognition among stakeholders of the importance of data and its role in informing public health policies to mitigate disease and address inequities. The increased visibility of CDPH's data systems raised awareness to invest in public health data systems and fostered greater data literacy among stakeholders. It has also created a deeper understanding of the complexity involved in behind-the-scenes data engineering and management.

Establish, Foster, and Leverage Partnerships

CDPH recognized early on that the severity, breadth, and duration of the pandemic required a collaborative response. By engaging with partners, CDPH utilized its extensive reach and expertise to enhance its response efforts. For example, many of California's nonprofits, community-based organizations (CBOs), and faith-based organizations were instrumental in promoting vaccine uptake. CBOs partnerships were also instrumental in expanding testing access and guiding the work of the Central Valley Task Force, which was deployed to help one of California's hardest-hit regions. California's universities provided critical scientific and technical knowledge, and helped pilot innovative technologies such as digital exposure notification (CA Notify). Additionally, public-private partnerships allowed CDPH to rapidly address immediate needs, such as establishing a scalable public call center when initial plans for a State-led center proved unfeasible. Furthermore, the State's ability to build new systems, shore up existing systems, and modernize its technology to meet changing pandemic needs was accomplished through effective partnerships with experienced system integrators. These collaborations not only filled gaps in existing State capabilities but also created innovative and comprehensive solutions.

Rapidly Provide Resources and Fully Utilize Expedited Procurement Processes

The authority to expedite and issue emergency contracts enabled CDPH to purchase the goods and services it needed quickly. This was made possible by expedited procurement processes, increased funding, and exemptions through the Governor's emergency orders. The ability to accelerate procurement was crucial, as it reduced the timeline from months to just hours or days. Emergency procurement authority was consistently highlighted by subject matter experts as a vital component of the response, proving indispensable to acquire staff, supplies, enhance technology, build laboratory capacity, and secure vendor resources quickly. The ability to address administrative barriers to ensure timely public health interventions—even without a declared state of emergency—remains critical.

Continue to Modernize Systems and Infrastructure

The pandemic underscored the critical importance to continuously modernize CDPH's technology systems and infrastructure to ensure readiness for future public health crises. In Summer 2020, as testing volumes spiked, the State's disease surveillance system (CalREDIE) and its associated gateway to receive data was overwhelmed by the volume of data and began to fail. Ultimately, CDPH technology teams were able to stabilize the system after months of working around the clock. Applying lessons learned from the stabilization of the gateway to submit data to CalREDIE, CDPH's technology teams worked quickly to procure and launch a new system called the California COVID-19 Reporting System (CCRS) to improve data ingestion for large volumes. Information technology teams also began bolstering another mission-critical legacy system, the Statewide immunization registry (CAIR2) to prepare for the arrival of vaccines in December 2020. Afterwards, it was clear that reliable and scalable technology was essential to provide the data needed for decision-making and policy-setting. Despite CDPH's significant technology advancements during the pandemic, including the implementation of multiple new cloud-based systems, there remains a pressing need to further develop data-sharing practices, system interoperability, cloud strategies, and predictive analytics. For example, surveillance data for one-third of California's population in Los Angeles & San Diego Counties is still submitted via an alternate work-around system due to outdated legacy CalREDIE system that still needs to be upgraded. It has also become clear that there is limited internal capacity to support timely data visualization and platforms for public dashboards, and these were possible primarily with outsourced resources beyond CDPH.

Equally crucial is the expansion and updating of physical infrastructure. For instance, the CDPH RSS warehouse reached its maximum capacity during the pandemic, putting it at risk of having to refuse essential deliveries such as personal protective equipment (PPE) and medical supplies. Additionally, an electrical panel failure during peak summer months posed a significant challenge to maintaining necessary climate-controlled conditions within the warehouse. By proactively addressing these technological and infrastructural challenges, CDPH improved its responsiveness and effectiveness to handle future public health emergencies.

Focus on Employee Well-Being

The COVID-19 pandemic response had wide-ranging effects on CDPH staff. Responders dealt with grueling work schedules, redirections and rotations, new and changing priorities, along with the simultaneous challenge to keep their own family members safe. Meanwhile, many programs and centers whose staff had been redirected to the emergency response struggled to fulfill their duties. Amidst rising concerns of staff burnout, CDPH launched many new initiatives to transform its culture and support its emergency responders and staff. CDPH leveraged mental health and wellness initiatives used by the State's contact tracing program as a model to develop similar offerings for all CDPH staff. Leadership also focused on building trust by cultivating an organizational culture focused on wellness, trauma-responsiveness, and resiliency. CDPH introduced a series of mental wellness initiatives focused on mitigating the effects of trauma and stress.

B. Cross-Cutting Themes

This section discusses cross-cutting themes that were shared by the COVID-19 response workstreams and functions.

Pandemic Response of Unprecedented Scope, Size, and Duration

"Whole-of-Government" Response

On January 24, 2020, CDPH activated the MHCC in response to COVID-19. When activated, the MHCC supports and coordinates the public health and medical emergency response between its Federal, State and local partners. It also responds to the needs of local public health and medical partners to fulfill resource and technical assistance requests. In March 2020, the Governor declared a State of Emergency, elevating the response to the second-highest level (and, later, the highest level) at the State Operations Center (SOC). The pandemic's unprecedented size and scope necessitated the State's leadership to establish priorities and provide critical decision-making, which resulted in a "whole-of-government" approach led by CalHHS, the Governor's Office, and Cal OES. In Spring 2020, the Governor's Office and Cal OES established multiple task forces each with their own staffing, reporting, and leadership structures. Ultimately, 19 different task forces were created. CDPH was a member on all task forces, but its role varied depending on the functional area. Consequently, the MHCC lost visibility into the work being done by the various task forces, which did not report to the MHCC or to CDPH.

Over the course of the pandemic, the MHCC navigated several new challenges, including the shift to remote operations, rapidly expanding, and managing multiple concurrent emergency activations. It implemented a health and safety program for CDPH staff and emergency responders, provided just-in-time training, and developed protocols to track and manage almost 2,000 COVID-19 responders over the course of the response, which included CDPH staff, redirected State staff, and external consultants.

Resource Requesting and Supply Distribution

One of the MHCC's key responsibilities involves overseeing a structured resource request process. This process, as delineated in California's Standardized Emergency Management System (SEMS), mandates that California jurisdictions seeking State assistance for medical and health resources (such as PPE, durable

medical equipment, and staffing) adhere to a preestablished approval chain. SEMS organizes this process into five levels. Each level attempts to fulfill the request locally before passing it up the chain. Ultimately, if resources are not located at the local or regional level, the Regional Disaster Medical Health Specialist (RDMHS) escalates the request to the State.

Once public health and medical resource requests make it to the State level, they are addressed by the MHCC Operations Team, who process them for fulfillment. In past emergency responses, the MHCC coordinated primarily with California's 61 LHJs. However, the "whole-of-government" approach required by the COVID-19 pandemic introduced many new response partners, including other State departments, multiple task forces, and other programs. This necessitated that the MHCC change its operating models to accommodate requests from new partners. These new stakeholders were unaware of SEMS and existing resource requesting protocols, which created confusion and miscommunication. When new official and unofficial channels emerged to request resources, the SEMS stakeholders were sometimes bypassed and lacked visibility into incoming requests. As a result, the MHCC devoted considerable time to untangling requests and aligning the partners.

From 2020 through 2022 the team processed approximately 56,000 unique orders that delivered over 1.9 billion items, including surgical masks, gloves, therapeutics, ventilators, and test kits. CDPH and its partners also successfully deployed over 23,000 medical staff (filling over 38,000 deployment requests) to healthcare facilities across California over the five surges, ultimately helping facilities avoid crisis care. The MHCC team strengthened its relationship with its local and regional partners as it worked to meet their needs and fulfill their requests.

In March 2020, in response to extraordinary global supply chain disruptions due to COVID-19, California's Office of Emergency Services (Cal OES) established the Logistics and Commodities Task Force, one of 19 COVID-19 task forces. This task force, led by Cal OES and the California Department of General Services, and supported by CDPH, the Emergency Management Services Agency (EMSA), and other State agencies, aimed to coordinate logistics efforts Statewide. The task force successfully implemented strategies to acquire, store, and distribute essential supplies such as PPE, medical equipment, and testing materials, despite global competition for these items. Competing with the worldwide demand for the same scarce supplies, task force members collaborated to procure critical resources for the State's stockpile.

Throughout the pandemic, CDPH's Receiving, Storage, and Staging (RSS) warehouse played a critical role in distributing an unprecedented volume of essential supplies. This inventory encompassed a vast array of items, known as medical countermeasures (MCM) that included PPE, COVID-19 testing kits, medical supplies, pharmaceuticals (including vaccines and treatment medications), and cold chain equipment. Each product had unique storage and packaging requirements.

When the RSS warehouse began receiving MCMs that required refrigeration, the warehouse team was well-prepared. A year before the pandemic, CDPH had updated its cold chain management plan to include procedures for receiving and distributing MCMs requiring cold storage. The team followed the procedures successfully for storing and transporting the COVID-19 testing transport media and therapeutics that needed refrigeration. However, the State had never dealt with the storage and handling of MCMs at unprecedented ultra-low temperatures required for some of the vaccines. Leveraging the updated plan, CDPH successfully purchased and positioned ultra-low cold chain equipment across the State.

Through November 2023, the RSS warehouse received 437.6 million units of inventory, which it shipped out to over 10,000 unique locations. This inventory included PPE, test kits, medical supplies, pharmaceuticals, and cold chain equipment. Initially, CDPH planned to distribute these supplies to the LHJs, which would then redistribute the items to healthcare providers in their jurisdictions. However, it quickly became evident most LHJs lacked the capabilities to receive, store, and ship such a large volume of inventory. Consequently, CDPH shifted its strategy to directly distribute the resources to healthcare providers, which exponentially increased the number of shipping locations.

CDPH improved its transportation capabilities by partnering with additional commercial trucking companies. In addition, a new shipping contract with a national carrier service vastly improved CDPH's small parcel shipping capabilities.

Unprecedented Amounts of Pandemic Funding

CDPH had never faced an emergency with funding needs as large as the COVID-19 emergency response. Since CDPH played a key leadership role in the State's overall emergency response, it received more State and federal emergency funding than any other State department. Through FY 2022/23, CDPH managed approximately $11.7 billion in State and federal funds

associated with COVID-19 through direct expenditures and flow-through funding to the LHJs.

CDPH leadership recognized that its existing fiscal organizational structure and processes would be insufficient to administer COVID-19 emergency funding. Upon the Governor's emergency declaration, CDPH leadership immediately assembled a cross-functional fiscal administration team from accounting, budgets, procurement, and contract management to determine how to manage the immense amount of State and federal funds CDPH would receive for the public health response.

The cross-functional fiscal administration team developed methods to monitor State and federal appropriations, expenditures, and fund sources to ensure there were sufficient funds to pay for COVID-19 response activities. However, the State's financial information system, FI$Cal, was not designed to support CDPH's COVID-19 fiscal management needs. For most fiscal administration activities, the fiscal teams created and maintained spreadsheets to support their work. Consequently, the overall financial status could only be determined from these spreadsheets.

For the federal funding, in 2020 and 2021 Congress passed legislation that provided federal funding to states and local entities. Some of the funding was allocated directly to the State while the remaining funds flowed to CDPH and LHJs through grants administered by the Centers for Disease Control and Prevention (CDC). Each COVID-19 funding stream had to be tracked and managed separately. Furthermore, the federal funds had unique requirements relative to allowable use, reporting, or period of availability. This required careful tracking and monitoring.

For the State funding, the California Legislature appropriated emergency funds for the COVID-19 response through different mechanisms than the typical budget processes used to fund ongoing State operations. Consequently, CDPH submitted special authorization requests to use these emergency funds. The documentation requirements changed each fiscal year of the response. As the number of State funding sources expanded through Disaster Relief Emergency Operations Account (DREOA) requests, CDPH leadership established the COVID-19 Fiscal Task Force in Spring 2021 to oversee fiscal management of State funds and refine processes to handle the increasing volume of work. For future emergency responses, it will be important to clearly identify the funding source for each response activity.

To better understand these evolving requirements, CDPH's COVID-19 Fiscal Task Force communicated frequently with CalHHS and the California Department of Finance (DOF). This ongoing communication was critical to understanding DOF's requirements for a successful funding request submission. DOF also assisted CDPH with its estimating processes, which the CDPH team adopted to successfully forecast and secure State funding and intends to utilize for future emergency response activities.

The CDPH Federal Emergency Management Agency (FEMA) reimbursement team also developed a strong relationship with Cal OES to facilitate the cost recovery process. As FEMA's grantee to the State of California, Cal OES is the official contact between FEMA and CDPH to provide technical support and assistance throughout the application and reimbursement process. The team met frequently with Cal OES and as a result, the team submitted project applications that were predominately approved by FEMA.

Focus on Health Equity

Health Equity Metrics Helped CDPH Reach At-Risk Populations

California's large population and substantial variation in demographics, socioeconomics, and availability of health care disproportionately impacted the disease burden of COVID-19 on historically marginalized segments of the State's population. Early on, the State's leadership recognized COVID-19 impacted certain subpopulations more through increased exposure and transmission, which leads to higher case rates, hospitalizations, and deaths in disadvantaged communities.

Beyond the immediate health effects, COVID-19 also led to significant secondary consequences to those with a higher disease burden, such as loss of income, loss of family members, and postponed medical care for chronic conditions. To mitigate these disproportional impacts, California took a leading role in advancing health equity by identifying and supporting vulnerable communities most at risk for the disease.

CDPH used health equity metrics to address the inequitable disease burdens suffered by its disadvantaged communities and vulnerable populations. These communities are identified in the Healthy Places Index (HPI), which was developed by the Public Health Alliance of Southern California. HPI is based on census tracts that have less healthy community conditions such as low median income, education completeness, and health care access.

Health equity and the use of HPI metrics was embedded in all response workstreams and areas, including contact tracing, testing, vaccinations, and therapeutics. For instance, in Summer 2020, CDPH and the Testing Task Force focused on improving testing equity for its PCR programs after realizing the rural populations had difficulty accessing drive-up testing sites. As new testing antigen programs were developed, the TTF established and monitored a variety of equity metrics and data points to measure progress. In Fall 2020, the State issued health equity criteria that had to be met by each county in order to make progress in reopening according to the Blueprint for a Safer Economy. In March 2021, the State announced its vaccine equity metric and its intention to set aside 40% of vaccine doses for the most impacted communities. This made California the first state in the nation to use equity metrics to guide reopening and to help increase allocations in communities that had been hardest hit by the pandemic.

Throughout the pandemic response, the State's numerous response teams, program areas, and task forces used the HPI and other equity metrics to monitor data, identify inequities, and develop innovative interventions to address them.

Protecting California's Vulnerable Residents of Skilled Nursing and Other Congregate Care Facilities

In addition to embedding health equity throughout the pandemic response, CDPH and the State also focused on protecting California's most vulnerable, elderly residents. California's first surge in Spring 2020 is referred to as the "SNF Surge," since many of the outbreaks occurred in high-risk settings such as SNFs and other congregate care facilities with vulnerable populations. In general, such facilities have historically had respiratory outbreaks, but had lacked the same resources to maintain infection prevention practices (such as hand washing, injection safety, and environmental cleaning) available in acute care hospitals. A number of additional factors contributed to outbreaks in these settings, including the vulnerability of the SNF population, a lack of early understanding about COVID-19 transmission, lack of testing, PPE shortages, inadequate training of SNF staff, and staffing shortages.

In collaboration with the California Department of Social Services (CDSS), the California Department of Aging (CDA), and other departments, CDPH increased training, education, and consultation to congregate care facilities and the State departments who oversee them on how to prevent COVID-19 infections and outbreaks. In addition, CDPH focused on supporting SNFs by providing an exponentially higher level of technical assistance than previously available by

the Healthcare Associated Infection program resources, helping procure and provide PPE in conjunction with Cal OES, and providing staffing support using Strike Teams and other federal, state, and contract staffing teams. CDPH's collaboration with CDSS and CDA was especially important and innovative, as it helped create a uniform response to congregate-type facilities statewide. New daily reporting requirements allowed CDPH to monitor and respond to facilities in need, and the creation of predictive analytical modeling helped identify facilities before they became overwhelmed.

Later in the year, when vaccines became available, CDPH also took action to prioritize SNF and long-term care facility (LTCF) populations for vaccination. During the first phase of California's vaccination program, which was defined by vaccine scarcity, the residents and workers residents of high-risk congregate care facilities were one of the first priority groups eligible for vaccination.

Communications Throughout the Response

State Partner Communications

The pandemic's unprecedented size and scope necessitated that leadership from the GO, CalHHS, CDPH, EMSA, and Cal OES set priorities and provide critical decision-making to manage the response in a "whole-of-government" approach. CDPH leadership participated in the Unified Command Group (UCG), comprised of State executives including the Governor and Cabinet Secretaries. These meetings facilitated cross-departmental collaboration, priority setting, and whole-of-government situational awareness in the pandemic response. CDPH received strategic direction from the UCG and also supplied crucial data and reports on hospitalizations, testing, contact tracing, and vaccinations. The need for detailed data required extensive preparation by CDPH. Overall, the UCG meetings were valuable as they provided an opportunity to put forth public health response priorities and provide direction to CDPH and guided the State's overall pandemic response.

LHJ Communications

CDPH's Local Coordination Team (LCT) promoted communications between CDPH and LHJs to implement the State's COVID-19 policies and initiatives. The LCT was established in August 2020 as the State launched the Blueprint for a Safer Economy. Prior to the pandemic, CDPH had well-established relationships with LHJs through its existing public health preparedness, communicable disease control, and immunization programs. However, it quickly became clear that

more robust coordination was necessary. To address this need, the LCT adopted a more robust two-way communications approach to better engage with LHJs. As a result, as conversations became more reciprocal and meaningful, LHJs reported seeing the value in their engagement with CDPH. Many of the response workstreams, including contact tracing, vaccines, and testing, also established regular meetings and communications channels with the LHJs.

Over time, the LCT became instrumental in discerning and addressing the emergency response needs of specific LHJs, linking them to relevant COVID-19 task forces, programs, and resources. Because the team understood the LHJ's needs and concerns, team members were often included into different COVID-19 initiatives such as outbreak response, vaccines, and testing.

Public Communications

Prior to the pandemic, a small CDPH communications office was devoted mainly to media relations, website content, and social media. In January 2020, with the public's beginning awareness of COVID-19, the communications office became inundated with requests for information. CDPH quickly realized the need to expand its public communications capabilities.

In response, CDPH increased its social media presence, created a team dedicated to outreach and education activities, expanded its capacity to respond to media inquiries, and improved the department's website. This resulted in a substantial increase in followers across the major social media platforms and improved CDPH's ability to disseminate information in real-time. To reach Californians with technology limitations, CDPH established a public call center to address questions from the public on COVID-19.

LHJs were an important partner in public communications. Early on, CDPH staff worked with LHJ Public Information Officers (PIOs) to better understand local information needs and identify ways to make messages empowering and impactful within local communities. CDPH supported this important partnership with a weekly e-newsletter that provided timely information and resources LHJs could use to reach out to their own communities. CDPH also enlisted the LHJs' assistance in public outreach by providing CDPH-produced toolkits and resources for LHJs to adapt to their audiences. These resources were designed to educate and engage traditionally under-served communities and populations that were disproportionately impacted by the pandemic.

Additionally, CDPH initiated different public communications associated with specific workstreams and response areas, including testing, contact tracing,

vaccines, therapeutics, long COVID, and pregnancy. Concurrent with the arrival of COVID-19 vaccines in California in December 2020, the State also launched the Vaccinate All 58 (VA58) campaign to disseminate accurate, relevant, and timely information on COVID-19 vaccines to the public, vaccine providers, LHJs, and elected officials. (The Vaccinate All 58 campaign conducted its own evaluation and therefore is not addressed in this report.)

Provider Communications

CDPH response teams were in constant communication with California's health care providers, including facilities and hospitals, in addition to other groups who worked closely with providers, such as counties, local public health officers, MHOACs, RDMHSs, and local deployment agencies. CDPH established regularly-scheduled meetings and office hours for different stakeholder groups, such as health officers, SNF facilities, LTCF providers, and the California Hospital Association. CDPH held All-Facility calls to provide updates and information and give stakeholders the opportunity to ask questions. Due to the rapidly evolving pandemic situation, CDPH issued an unprecedented number of All Facilities Letters to keep healthcare facilities up to date on the State's COVID-19 guidance. In addition, the department utilized the California Health Alert Network (CAHAN) to disseminate treatment and infection prevention guidance to licensed healthcare facilities.

To address misinformation and hesitancy about vaccines, CDPH developed numerous communication channels to keep healthcare providers informed with current vaccine information. These channels included weekly webinars, weekly office hours, an email listserv, a website, a provider call center, a dedicated Partner Communications team, and various vendor-staffed help desks that provided technology assistance.

Technology and Data

CDPH Strengthened its Enterprise Technology Infrastructure to Support the Pandemic Response

The COVID-19 pandemic highlighted the critical importance of technology systems in unexpected and unprecedented ways. The need for accurate, timely metrics to make rapid policy decisions elevated the importance and visibility of public health technology systems. The unparalleled demand for data and metrics was universal across workstreams and program areas, from outbreaks,

hospitalizations, and deaths to testing, contact tracing, vaccines, and equity measures.

In early 2020, it quickly became clear that CDPH's enterprise technology systems and technology teams were not staffed or equipped to provide the data needed to policy leaders to make informed decisions. The existing systems had never been designed for a pandemic of such magnitude, and many had been underfunded for years. In response, State leadership deployed technology support teams from the California Department of Technology (CDT), the Office of Data and Innovation (ODI), and the California Government Operations Agency (GovOps) to assist CDPH.

CalHHS, CDT, and CDPH had to make key decisions about whether to reinforce older, existing systems or build completely new systems. In some cases, existing systems, including the State's disease surveillance system (CalREDIE) and immunization registry (CAIR2), were bolstered and augmented in order to keep up with data volumes. In other cases, CDPH implemented new cloud-based systems to support the rapid expansion of program areas, especially around vaccines and contact tracing. Lastly, many of the new systems had to be integrated with the existing systems, a difficult task that required additional technology "middleware" to help the various systems exchange data and communicate with each other.

As part of its pandemic response, the State implemented five new major systems: CalCONNECT, CCRS, myCAvax, My Turn, and the Digital Vaccine Record. With the support of State and vendors partners, CDPH procured and implemented these systems with record speed. Each system presented an innovative solution to prior gaps in public health systems that addressed a specific urgent pandemic problem, from the public-focused systems that enabled Californians to book vaccine appointments and obtain their digital vaccine card, to systems that allowed LHJs and providers to investigate cases, contacts, and outbreaks more effectively, order vaccines, schedule and manage clinics, and report vaccinations.

Under the guidance of the State Chief Information Officer (CIO) and CDPH leadership, these new technology systems were able to move quickly from concept to go-live due to expedited procurement processes made possible by Executive Orders. Throughout the response effort, the implementation of the new technology systems and the augmentation of existing systems at CDPH was led by the State CIO and supported by CDPH and CDT personnel, vendors and consultants, and other State partners and stakeholders. The ability to procure

resources quickly and expedite contracting and approval processes was the foundation of these ultimately successful efforts.

CDPH Developed Robust Data and Reporting Processes to Inform Policy-Making

CDPH made significant progress to establish robust data and reporting solutions throughout the pandemic response to receive and process large data volumes, integrate various data streams, meet new reporting requirements, and provide accurate, timely, and high-quality data. The implementation of CCRS and a data warehouse in Fall 2020 represented a major milestone in automating COVID-19 data reporting and meeting increased test data volumes.

CDPH devoted resources to data reporting by establishing a new Data Processing and Informatics section to better standardize, integrate, and centralize COVID-19 data streams. The newly formed team maintained the data sources for tests, cases, and other COVID-19 data, and also created integrations across disparate datasets for other teams to use in their analysis involving test results, case data, vaccination data, death data, and hospitalization data.

Starting in March 2020, California began to report case, death, and hospitalization data on public data dashboards. CDPH and its partners shared COVID-19 data with the public through innovative, visually appealing dashboards and the Open Data Portal, empowering Californians to access and analyze information on their own. Prior to the pandemic, most public disease reports were static tables or graphics, often with data from months or years prior. In contrast, the State's COVID-19 dashboards presented data, charts, and tables that became more visually appealing and user friendly over time. The capability to create these dashboards was largely conducted by external contractors or resources, and there is limited capacity to continue these moving forward.

In addition to these dashboards, California also made COVID-19 datasets available via its Open Data Portal. This portal enabled anyone to download raw data sets for their own analysis and research. Over the course of the pandemic CDPH, CalHHS, and State leadership released many iterations of the dashboards to add new datasets, integrations, and improve data privacy, accuracy, and integrity. The COVID-19 dashboards and the Open Data Portal are seen as unequivocal successes that empowered Californians to obtain up-to-date information on the latest COVID-19 facts and trends.

Sustaining the Investments

While CDPH's technology tools, systems, and operational models have greatly matured, the focus has now shifted to how to sustain the significant improvements that were achieved, and transition and scale down where necessary. While many of the new systems were built specifically to address the COVID-19 pandemic, they also filled gaps and program areas that were previously lacking. Efforts are currently underway to secure ongoing funding and obtain administrative approvals to maintain or expand the pandemic systems, as well as to replace the existing legacy systems that were so difficult to update or scale. The goal is to ensure robust enterprise technology solutions that can support timely policy decision-making and data-sharing with State and local partners.

Authorities

CDPH Issued Unprecedented Numbers of Public Health Orders to Prevent the Spread of COVID-19

A public health order is a legal directive that requires or prohibits certain actions or behaviors to protect the health and safety of Californians during a public health emergency. Historically, during public health emergencies, LHJs have been responsible for issuing public health orders. However, the size, scope, and scale of the COVID-19 pandemic necessitated that CDPH issue Statewide public health orders. Some LHJs also faced resistance and hostilities to local-based public health orders. During the first Winter surge, as the timing of the impact of the pandemic varied in different regions, the State also issued numerous regional public health orders to maintain consistent policies across regions to more closely tailor restrictions to regional impact. Developed in coordination with CalHHS to align with the Governor's orders, these State public health orders mitigated regional and local variations and ensured a consistent approach.

The State's public health orders included requirements, recommendations, and/or restrictions to help prevent the spread of COVID-19, reduce impact on the healthcare system, keep children in schools, and safeguard public health. As more became known about the epidemiology of COVID-19 and the pandemic response evolved, CDPH amended existing public health orders. These amendments reflected changes in scientific understanding, new recommendations from the CDC, or updates to the State's guidance and regulations. Through this adaptive approach, CDPH worked to keep its public health strategies current, evidence-driven, and tailored to the dynamic nature of the pandemic.

Emergency Contracting Authority Enabled CDPH to Quickly Procure Resources

In March 2020, the Governor issued an Executive Order authorizing State agencies to use emergency powers to respond to the pandemic including emergency contracting authority. This suspended the competitive bidding requirements for COVID-19-related State contracts, CDPH designated a COVID-19 Emergency Procurement Officer to oversee COVID-19 emergency contracts with the authority to negotiate on behalf of CDPH and make critical decisions. CDPH also assigned a dedicated team of attorneys to support contracting and procurement. The Emergency Procurement Officer and OLS attorneys identified suitable vendors, negotiated prices, and strategically acquired goods and services to meet the urgent needs of the pandemic.

This authority was essential to many successes across numerous pandemic response workstreams. For instance, it enabled the State to rapidly build its own PCR testing laboratory, provide hospitals and other facilities with contracted staff during surges, rapidly hire other staff and contractors for specific initiatives, purchase PPE and other supplies, collaborate with academic partners and community based organizations, and quickly implement the new technology solutions.

Additionally, CDPH's extensive coordination with its partners (EMSA, Cal OES, and DGS) proved instrumental to expedite contract processing, identify funding sources for contracts, and promptly pay invoices. Due to the urgent need to procure emergency services and supplies, the COVID-19 Emergency Procurement Officer negotiated with vendors at a fast pace and the team worked with DGS to quickly finalize the negotiated terms into contracts. Simultaneously, CDPH met regularly with DOF to secure emergency funding and identify potential funding streams. To obtain more favorable pricing, the COVID-19 Emergency Procurement Officer sometimes negotiated contracts that incorporated shorter payment terms (e.g., within 10 or 15 days of invoice receipt), deviating from the standard 45-day period. This process accelerated CDPH's ability to rapidly acquire lifesaving goods and services, which were in high demand by other states and countries.

CDPH Granted Temporary Licensing Waivers To Help Hospitals Expand their Capacity

It became clear early in the pandemic response that California needed more staffed hospital beds. Based on modeling projections, State leadership

estimated in April 2020 that California would need an additional 50,000 hospital beds, which included a hospital surge capacity of 20%. As part of the Medical Surge Task Force, CDPH, EMSA, Cal OES, and other partners collaborated on innovative solutions to expand capacity in healthcare facilities and create new care spaces at alternative sites. Executive Order N-39-20 (March 30, 2020) provided CDPH the flexibility to temporarily waive certain licensing requirements, so that care spaces could be modified in non-traditional ways and allow facilities to expand their capacity. For example, waivers allowed patient beds to be installed in conference rooms and enabled pediatric ICUs to be converted to adult ICUs, while other waivers enabled more isolation rooms and negative pressure rooms. These were monumental accomplishments, given the complexity of care space requirements and building codes.

The CDPH CHCQ policy and legislative branch reviewed statutory and regulatory requirements for 30 facility and provider types and rapidly explored options to waive or modify guidelines for delivering care in more than 11,000 healthcare settings. The most commonly waived requirements included training, staffing ratios, space usage, and the ability to expand services. Over the course of the pandemic, CHCQ issued 272 AFLs to help facilities expand capacity and protect their patients and workers.

CDPH Developed Policies and Guidance for Numerous Stakeholder Groups on Different Pandemic Topics

In addition to issuing public health orders, CDPH also issued public health policies and guidance. The COVID-19 pandemic prompted an urgent need for the State to rapidly develop policies and guidance to individuals, congregate settings, businesses, healthcare providers, schools and universities, and many other stakeholders. In the early stages of the pandemic, CDPH did not have procedures to quickly develop, approve, and disseminate public health policies and guidance necessitated by the pandemic. Faced with hundreds of different questions from stakeholders, CDPH needed to quickly provide guidance to specific business sectors (e.g., restaurants, retail, entertainment, etc.), specific facilities (e.g., healthcare facilities, incarcerated populations, shelters, schools, etc.) on different topics (e.g., physical distancing, masking, testing, vaccines, therapeutics, isolation and quarantine, indoor air quality, etc.).

The process to issue guidance was initially chaotic, since many different stakeholders formulated and vetted policies. Guidance documents on similar topics began to originate in different places—sometimes in a different department, different parts of CDPH, or through the Governor's Office.

To improve this situation, CDPH leadership designated a Guidance and Policy Team to centralize and standardize the policy development, review, revision, approval, and dissemination processes. This team vastly improved an essential function, which was critical to responding to the unprecedented need for policy direction by so many stakeholders. CDPH subsequently used these new practices and workflows for other emergency response activations (such as mpox) and continues to use this same approach for other activations.

CDPH also continuously examined if its guidance conflicted with the guidance issued by other State agencies that regulate certain industries and sectors. This required CDPH to quickly partner with State agencies with which it had not previously collaborated. CDPH staff encountered significant challenges to synchronize and align its guidance across these numerous government entities. Despite these challenges, these relationships yielded significant results. In the future, CDPH and its partners can explore whether it would be useful to develop more standardized guidance for broader entity types. Maintaining these partnerships and defining a systematic approach for future coordination will be indispensable to navigate the next public health emergency more effectively.

C. Summary of Major Response Activities

This section summarizes CDPH's major response activities and workstreams, including epidemiology, surveillance, case management, mitigation efforts, healthcare surge, testing, vaccines, and therapeutics.

Epidemiology, Surveillance, and Disease Control Management

Within public health, epidemiology and surveillance are core functions that are closely intertwined. Epidemiology is the study and analysis of the distribution, patterns, and determinants of health and disease conditions in defined populations. It is a cornerstone of public health to inform policy decisions and evidence-based practices by identifying risk factors for diseases and preventive healthcare measures.

Surveillance is operationally focused and is disease- or condition-specific. Its primary aim is to monitor trends over time, detect outbreaks, and guide immediate public health practices. While epidemiology provides the scientific basis for public health action, surveillance is the operational arm that monitors health events as they happen, enabling prompt action. Surveillance systems often generate data that is used in epidemiological studies, and findings from epidemiological studies may, in turn, inform the design and focus of surveillance systems.

Communicable disease control involves case, contact, and outbreak investigation, and management of disease control and prevention encompasses a multifaceted approach, aimed at mitigating the spread of disease through organized public health interventions. This includes strategies to contain disease by isolation or quarantine of infected or exposed individuals, provide post-exposure prophylaxis for the exposed, and facilitate treatment of cases both to improve health of individuals and decrease further exposure to others. Outbreak investigations involve identifying and investigating cases to identify common or ongoing exposures, and implementing outbreak measures to a group or setting to remove or reduce exposure(s) and contain the outbreak.

Epidemiology and Surveillance

At the start of the COVID-19 pandemic in early 2020, CDPH quickly marshalled its epidemiological and surveillance resources to better study, track, and understand the SARS-CoV-2 virus that causes COVID-19 to develop appropriate mitigation and response measures. CDPH redirected technical staff to the newly-formed Coronavirus Science Branch, directed laboratories (labs) across the State to report positive and negative COVID-19 test results, and configured CalREDIE, its existing disease surveillance system, to process COVID-19 data.

As CDPH collected traditional case reports from local health departments and received laboratory-based test results for COVID-19, many challenges emerged. Testing was severely limited, CalREDIE could only collect certain types of epidemiological data, and labs struggled to report correctly. Very little was known about the virus that caused COVID-19, and CDPH leadership surmised that COVID-19 was more widespread in California than the surveillance suggested.

Consequently, CDPH began to identify and implement supplemental surveillance projects to help provide a more comprehensive epidemiological assessment of COVID-19 and its impacts. Many of these projects were conducted in partnerships with LHJs, universities, nonprofit organizations, and private industry. These projects included wastewater surveillance, whole genome sequencing (genomic surveillance), sero-surveillance, and others. Over the course of the pandemic, CDPH conducted new, innovative epidemiological and surveillance projects, developed sophisticated modeling capabilities, and improved its data streams, systems, and infrastructure—which in turn collectively enhanced its surveillance abilities.

CDPH's epidemiological surveillance strategy evolved over time and adapted to changing pandemic needs. For instance, as new epidemiological questions arose, CDPH launched new surveillance projects to help provide answers. CDPH subsequently discontinued certain initiatives if the questions were resolved or if the data was no longer relevant. Other projects, such as genomic surveillance and wastewater surveillance, remain ongoing.

Additional related initiatives—data modeling and outbreak consultation—used the data derived from epidemiological surveillance to inform response operations (for instance, to prepare for surges and respond to outbreaks). In particular, data modeling became an established part of CDPH's infrastructure and has been adapted beyond COVID-19 to include other infectious diseases.

Disease Control Management

CDPH first became involved in case management early in the pandemic during the repatriation, quarantine, and returning traveler monitoring of American citizens who were on cruise ships in Asia when the federal quarantine order took effect. Hundreds of U.S. citizens returning on repatriation flights were quarantined at California military bases run by federal partners. CDPH established a Returning Traveler Monitoring (RTM) program and helped local partners feed, care for, and monitor individuals that were unable to isolate or quarantine on their own. CDPH also worked with federal and State partners, including Cal OES and EMSA, to manage testing, medical care, and transportation for thousands of cruise ship passengers. While this effort was intense, it was also short-lived, as the pandemic and its response quickly evolved. In California, the first confirmed case of COVID-19 without known exposure to a traveler or a patient with COVID-19 was on February 26, 2020. This was the first case of community transmission in the State, and it precipitated California's shift from containment to mitigation. Consequently, the RTM program was disbanded in mid-March 2020.

CDPH's early disease control management also focused on developing infection prevention strategies to address the spread of COVID-19 in high-risk settings such as SNFs, LTCFs, and other healthcare facilities. As the vulnerability of SNF populations became apparent and outbreaks grew in early 2020, the State helped these facilities adopt and implement stronger tactics and resources to prevent the spread of COVID-19. This was a new challenge since these facilities typically do not have the resources to maintain the rigorous infection prevention standards that acute-care settings (e.g., hospitals) have. CDPH's medical epidemiology team played a key role in investigating outbreaks and uncovering transmission patterns and trends—which was especially critical in early 2020 when little was known about COVID-19's epidemiology. This team's work informed Statewide infection prevention guidance and facility-wide approaches.

Lasty, CDPH also became involved in disease control management through its leadership of the Statewide contact tracing program, CalCONNECT. Contact tracing is a confidential investigation and notification process and core disease control measure that has been used by public health departments for decades to slow the spread of infectious disease and prevent additional cases and outbreaks for diseases such as measles, tuberculosis, syphilis, HIV, and COVID-19. Through contact tracing, public health staff identify people who have been exposed to someone with an infectious disease to offer them information and

guidance. This can slow the spread of the disease, help avoid outbreaks, and keep the public safe from infection and serious illness.

On May 22, 2020, Governor Newsom launched California Connected, CDPH's contact tracing program and public awareness campaign. CDPH created this new program from scratch and in record speed. The California Connected program consisted of thousands of local contact tracers, over 200 program staff, multiple new technology systems, and a new virtual training academy. What was originally termed a "contact tracing" program included broader disease and outbreak investigation activities and tools, for case investigation, contact notification and eventually contact monitoring and tools for outbreak investigations. *Case investigators* communicated with individuals diagnosed with COVID-19 to identify others potentially exposed; then, *contact tracers* attempted to notify their contacts about possible exposure to COVID-19 and the need to quarantine.

At this point in time, neither vaccines nor therapeutics were available. Very little was known about SARS-CoV-2, and PPE was scarce. Surges had not occurred yet and case numbers were low. In this environment, containment was critical, and contact tracing work was the best tool to help contain the virus and slow the spread. But as the pandemic evolved, so did California's case investigation and contact tracing approach. The main objective of early case investigation and contact tracing was to stop the spread of the disease by contacting every single contact; but this soon became untenable when cases soared exponentially.

The State's case investigation and contact tracing strategy began to shift in mid-2021 with emergence of the Delta variant. The effort began to prioritize case investigation and contact tracing as applied with other more common infectious diseases. Rather than investigate and follow up on the contacts for every single case, CDPH encouraged LHJs to prioritize cases by identifying specific types of highest risk settings and situations for full case investigation and contact tracing. These included dense settings with high-risk of disease transmission (e.g. congregate living facilities) and/or populations with highest risk of severe disease (e.g., healthcare facilities, SNFs).

The emergence of the highly contagious Omicron variant in late 2021 and early 2022 accelerated the shift to more targeted case investigation and contact tracing. In late January 2022, several national organizations representing local and state public health officials recommended that case investigation and contact tracing should be prioritized for specific, prioritized high-risk settings and

situations. In late February/early March 2022, CDC and CDPH formally updated their recommendations as well. The California Connected program concluded its work on July 30, 2022.

Mitigation Efforts

Nonpharmaceutical interventions (NPIs) are health interventions to slow the spread of an infectious disease that are not primarily based on medication. NPIs are categorized as personal, community, or environmental. Personal NPIs include frequent handwashing, isolating when exposed, staying home when sick, and use of PPE including wearing a face covering/respirator. Community-based NPIs include physical distancing and closure of settings where people gather. Environmental NPIs encompass routine surface cleaning, ventilation, and indoor air quality.

Personal NPIs

At the start of the pandemic, CDPH issued policies and guidance on personal NPIs of basic preventative actions that individuals could easily implement on their own, such as handwashing, isolation if infected with COVID-19, quarantine if a known exposure to COVID-19, and using face covers. At the onset of the pandemic, the State relied on CDC's isolation and quarantine guidance to develop the State's policies, and isolation and quarantine orders were issued at the local level. At that time, the CDC recommended an isolation period of 10 days, and a quarantine period of 14 days after COVID-19 exposure. By late July 2020, State leadership recognized this length of time imposed physical, mental, social, and economic hardship. Furthermore, the scientific evidence at the time suggested people with mild to moderate COVID-19 typically remained infectious for ten days. As a result, CDPH updated its guidance to reduce the quarantine periods for exposed people. Guidance for isolation and quarantine periods continued to evolve over the course of the pandemic and CDPH worked closely with partners to make updates based on the evolution of science on duration of incubation periods, infectiousness, and severity of disease after reaching high levels of population immunity.

In 2021, as vaccines became widely available and reduced transmission risks, California introduced a symptom-based strategy for isolation while still advocating for preventive measures such as mask-wearing and social distancing. In June 2022, definitions for infectious periods were included in a State Public Health Officer Order and Cal OSHA Emergency Temporary Standards referred to CDPH Orders for some definitions.

By 2022, the State standardized a five-day isolation period for everyone, irrespective of vaccination status. By May 2023, these guidelines were updated to reflect the latest CDC recommendations, emphasizing a five-day isolation period for those testing positive, contingent on symptom improvement.

Throughout the COVID-19 pandemic, CDPH faced significant challenges in implementing and adjusting its policies on masks. Initially, federal health authorities were hesitant to recommend widespread mask usage, citing the need to conserve supplies for healthcare workers. By early April 2020, however, the federal guidance shifted to endorse masks for all individuals over two years old in public settings due to growing evidence that asymptomatic individuals could transmit SARS-CoV-2. The first statewide guidance, issued on April 1, 2020, recommended masks outdoors and emphasized that masks should complement, not replace, other NPIs like social distancing and handwashing.

The scientific consensus on the efficacy of masks in reducing virus transmission strengthened by late spring 2020, prompting CDPH to mandate masks in indoor public spaces and certain other settings. This mandate persisted into the following year, with adjustments in mid-2021 to relax requirements for fully vaccinated individuals (in some scenarios), though masks remained mandatory in high-risk environments. Throughout 2021 and 2022, the emergence of new virus variants and varying vaccination rates necessitated multiple updates to the guidance. Finally, in March 2023, as the public health emergency was anticipated to conclude in May, CDPH ended its broad masking mandates. It transitioned to a focus on education and personal responsibility regarding mask use based on local transmission rates and individual health risks.

During the first year of the pandemic, CDPH Occupational Health Branch (OHB) staff, including its industrial hygienists, served as the subject matter experts for the State's stockpile of PPE. Their expertise proved crucial, especially considering the worldwide shortage of PPE, especially N-95 respirators. OHB provided expertise on procurement sources, provided quality assurance, and educated CDPH staff about design specifications, usage protocols, and certified equipment. When a supply shortage of respirators occurred, OHB issued guidance on the use of cloth face coverings. As supplies stabilized, OHB guided the transition back to N-95, KN-95, and KF-94 masks, including child-sized options, supplementing this with materials on proper mask fit.

Community-Based NPIs

In early March 2020, the Governor's Office began discussing community-based NPIs to limit movement across the State, including cancelling mass gatherings of more than 250 people. CDPH leadership provided input on the public health and safety impacts of potential closures of various sectors of California's economy. The State Public Health Officer issued a statewide Stay-at-Home public health order on March 19, 2020, which specified who could continue working. This order allowed Californians employed in critical infrastructure sectors to continue working outside of their homes; all other residents were ordered to stay at home. The order also stipulated that, should individuals venture out for essential activities, Californians should practice social distancing.

A month later, the State started planning how it would end the Stay-at-Home order's restrictions. On April 14, 2020, the State issued the Pandemic Resilience Roadmap, which required counties to reintroduce activities and sectors in a gradual, phased manner. However, as lower-risk workplaces and other spaces opened, the State experienced a significant increase in the spread of COVID-19. Consequently, on July 13, 2020, the State Public Health Officer ordered the Statewide closure of operations in certain high-risk sectors (such as bars and indoor dining in restaurants) to slow community transmission.

The State then faced the complex challenge of gradually reopening the economy without triggering a resurgence of COVID-19 cases. Lacking guidance and a framework from the CDC, a team comprised of CDPH, CalHHS, and Governor's Office representatives created a data-based re-opening plan that could be implemented. The plan laid out the metrics that each county needed to meet, based on disease burden, testing, and eventually health equity.

California's reopening strategy, termed the Blueprint for a Safer Economy, established metrics to categorize counties by COVID-19 risk levels, influencing their ability to open or close various sectors. During the winter of 2020-21, the State faced a surge in COVID-19 cases, hospitalizations, and positivity rates. In response, officials intensified the implementation of the Blueprint measures by applying an "emergency brake" to move counties into more restrictive tiers, and days later implemented a limited Stay-at-Home order, restricting movements from 10pm to 5am. Despite these efforts, the number of daily cases continued to rise significantly. With vaccines not yet available, State leadership considered further NPIs to avoid overwhelming healthcare facilities.

LHJs in some regions wanted to implement a Stay-at-Home order to curb the spread, and disease burden was variable by region. Since individual orders may not be coordinated or consistent across regions, and local resistance was also

anticipated by some within their jurisdictions the State issued a Regional Stay-at-Home public health order on December 3, 2020 that superseded the Blueprint's framework. The State started to issue orders by region as the metrics warranted and this proved very successful. California used modeling projections for intensive care unit (ICU) capacity to determine when regional Stay-at-Home orders could be lifted as the Winter surge of hospitalized cases subsided.

After the Blueprint concluded in June 2021, California transitioned into a new phase of the pandemic, known as Beyond the Blueprint, marked by readily available COVID-19 vaccines and a decline in transmission rates. CDPH continued to monitor scientific evidence and epidemiological data, adapting guidance as necessary to reflect evolving public health conditions and recommendations from the CDC and other public health authorities.

Environmental NPIs

CDPH provided vital guidance on environmental NPIs, which included surface cleaning, disinfection, and air ventilation. At the start of the pandemic, when little was known about SARS-CoV-2's transmission mechanisms, industries and schools urgently sought information on effective and safe cleaning methods, especially since an overuse of disinfectants could potentially lead to asthma. In response, CDPH began issuing guidance on environmental NPIs, starting with guidance on cleaning and disinfecting protocols in February 2020.

As discussions intensified around the transmission mechanism of COVID-19, emerging scientific evidence highlighted the potential for not only direct shorter distance "droplet" sized face-to-face transmission but also indirect broader aerosol-based spread in indoor settings. Even as public health officials came to understand how the SARS-CoV-2 was transmitted, the precise role of ventilation in transmission was still unclear and no State agency laid out specific guidance on indoor air quality. In this environment, CDPH OHB staff gained recognition as trailblazers in developing guidance on aerosol transmission.

Drawing from their expertise in respirator protection and ventilation, OHB, in collaboration with Cal/OSHA and the CHCQ Healthcare-Associated Infections (HAI) Program, unveiled the "Interim Guidance for Ventilation and Air Quality" in February 2021. This was updated in August 2023 to align with CDC recommendations. This framework provided practical measures for schools, business, offices, and other entities on how to improve ventilation, filtration, and overall indoor air quality to combat the spread of COVID-19.

Mitigation in Schools

In mid-March 2020, local authorities closed multiple school districts across the State due to concerns about COVID-19 spread. The Governor issued an Executive Order on March 13, 2020 ensuring that schools would continue to receive State funding while closed, and that schools should continue to deliver education through distance learning and safely provide school meals. By early August 2020, California issued initial guidance with a framework for returning to school. As California's K-12 schools continued preparations to return to in-person learning during the winter of 2020-2021 academic year, many grappled with the complexities of implementing public health protocols essential to managing COVID-19 transmission and spread. Recognizing these challenges, the Governor unveiled the Safe Schools for All (SS4A) Plan and designated an inter-departmental SS4A team, drawing members from CDPH, California Department of Education (CDE), the California State Board of Education, Cal/OSHA, California Department of General Services (DGS), and CalHHS. The SS4A team developed a multi-faceted approach to deliver essential guidance, technical assistance, and educational outreach to LHJs, County Offices of Education (COE), and the broader school community. The team engaged with its local partners through online platforms, communication campaigns, training sessions, and regular meetings to build a cohesive strategy. Beyond these tactical efforts, they prioritized relationship-building and coordinated with public health and education officials across California.

Healthcare Surge

In general, medical surges create an acute need for healthcare beyond what a healthcare delivery system can provide. When medical surges are so overwhelming that capacity is exhausted, hospitals and facilities are forced to implement crisis standards of care. When a facility enters crisis care, normal healthcare operations cannot be maintained and the focus shifts to reducing care to individual patients to maximize health outcomes for the entire population.

As the number of COVID-19 cases in California rose rapidly in early Spring 2020, the State established the Medical Surge Task Force to prevent excess morbidity and avoid the implementation of crisis care. The Medical Surge Task Force included leaders from CDPH, EMSA, Cal OES, and CalHHS (among others) to collaborate on the whole-of-government response. Based on modeling projections, State leadership estimated that California would need an additional 50,000 hospital beds, which included a hospital surge capacity of 20%. The

Medical Surge Task Force began working on strategies to increase surge capacity by taking actions to acquire supplies, space, and staff.

While all these entities played a role in the medical surge response, certain State departments took the lead on distinct work streams:

- CDPH oversaw medical surge data and reporting.
- Cal OES managed logistics and supplies including PPE and oxygen.
- EMSA managed resources and spearheaded patient transfers.
- The California Department of Healthcare Access and Information (HCAI) helped with oxygen planning and preparedness.
- CalHHS led policy and guidance, staffing, and reimbursements.

In addition, the Medical Surge Task Force quickly established State technical assistance teams to support skilled nursing and other facilities. Through the State technical assistance teams, the State communicated with facilities in crisis to assess and deploy resources rapidly.

CDPH and its partners launched multipronged efforts to increase healthcare capacity across the State by expanding capacity within hospital facilities as well as developing alternative care sites (ACSs) and granting waivers. The Medical Surge Task Force established 10 ACSs across the State to care for less ill patients, thus making more hospital beds available for higher acuity patients who needed more intensive care. The ACSs were not needed as much as anticipated, and as staffing was the limiting factor, focus and priority shifted to obtaining additional staffing, which is an important lesson learned for future pandemics.

In addition to facility expansion, CDPH and its Medical Surge Task Force partners created and operationalized a supplemental staffing system that provided essential support to facilities, to prevent crisis care. CDPH managed complex staffing functions including procurement, deployment, tracking, reporting, and invoicing. The team also managed multiple federal, State, volunteer, and contracted staffing pools, deploying different pools based on unique facility needs. During the Omicron surge, the Medical Surge Task Force introduced two new types of staffing interventions—ambulance strike teams, who helped reduce ambulance wait times at emergency rooms, and mobile monoclonal antibody strike teams, to promote therapeutics to COVID-19 patient in facilities experiencing outbreaks. Ultimately, CDPH's internal team and its partners

successfully deployed over 23,000 medical staff (filling over 38,000 deployment requests) to healthcare facilities during the pandemic.

Testing

When COVID-19 emerged in late 2019, it quickly became clear that California's testing infrastructure was unprepared to meet the coming demand for mass testing. The Governor's Office subsequently formed the Testing Task Force (TTF) as a public-private partnership to increase access to testing for all Californians, particularly communities at higher risk.

Early in the pandemic response, the only testing modality (e.g., type) available was polymerase chain reaction (PCR) testing, a sensitive molecular test. PCR test samples were collected from individuals and transported to a lab for processing, with results typically available in 24 to 72 hours. However, in early 2020 California's labs were hampered by testing supply shortages and overwhelmed by increasing testing volumes, which increased turnaround times. Consequently, the TTF's early efforts focused on building capacity for PCR tests and addressing the testing supply shortages.

To expand PCR testing capacity, California built and operationalized a State-run laboratory, the Valencia Branch Laboratory. The lab was based on a new "hub and spoke" testing model, in which testing sites across the State (the spokes) would send their specimens to the centralized State-run lab (the hub). This new model was designed to increase testing capacity, reduce turnaround times, and stabilize the supply of testing materials. In just two months, the State contracted with vendors to construct and operate the lab.

While the State and its vendor partners worked on building the State-run lab, the TTF expanded its staff to create a testing network, which eventually included over 200 State-run and 3,400 State-supported PCR community testing sites. These included expanding existing State-run fixed sites, mobile sites, and traveling teams, as well as collaborating with community-based organizations (CBOs) to establish a new type of testing site, known as a "collection site." For new State-supported sites, the TTF helped with site set-up and provided free test kits, test processing, and a registration and reporting platform. The sites were subsequently run by community members and utilized public spaces. This new model, in which the State partnered with communities to conduct ongoing testing, updated the model for infectious disease testing.

When the first COVID-19 rapid antigen tests became available in early fall 2020, California faced challenges integrating them into its existing PCR testing strategy. Antigen tests could be performed by anyone and anywhere, with results available within 15 to 30 minutes. Antigen tests were quicker and cheaper but less sensitive than PCR tests. Early shipments of antigen tests from the federal government directly to California facilities created several regulatory hurdles.

Since antigen test results were interpreted on-site, they were considered point-of-care tests, and were subject to specific Clinical Laboratory Improvement Amendment (CLIA) requirements. These requirements proved to be significant obstacles to implementing antigen testing on a large scale. To address these hurdles, CDPH and the TTF collaborated to issue a Statewide CLIA waiver to streamline the authorization process for sites to administer antigen tests without individual CLIA certifications. Instead, testing personnel were trained and took a competency test. Concurrently, TTF leveraged its existing infrastructure for PCR testing and established antigen testing pilots in facilities and schools to refine the process and training programs for widespread implementation. These efforts laid the groundwork for a no-cost Statewide antigen testing program and expanded the State's testing capabilities.

Over the course of the pandemic, the TTF scope of activities increased. The TTF's many innovations included developing a courier network to transport test samples, equity-based operational support for schools and other community-based sites, airport testing for returning international travelers, and implementing Test-to-Treat sites to provide one-stop testing and therapeutics dispensing. Ultimately, over 14 million COVID-19 PCR tests were administered, 25 million professional antigen tests were performed through the TTF programs, and over 107 million test kits were distributed.

Vaccines

The pandemic marked the first time that the U.S. federal government supplied COVID-19 vaccines to the entire American population, irrespective of insurance coverage. The State, tasked with administering the vaccines, successfully orchestrated an extensive, unprecedented vaccination campaign across the State.

In December 2020 California established the Governor's COVID-19 Vaccine Task Force (VTF), with CDPH taking a leading role. The VTF, composed of executive-level leaders from across State government, focused on overseeing the implementation of the Statewide vaccination program. Recognizing the need

for additional support, the VTF quickly expanded its resources, using the expedited procurement processes. This agility allowed CDPH to secure contracts with vendors for a wide range of vaccine-related services and supplies. These included technology, consulting services, technical expertise, infrastructure for call centers, extra staffing, mobile vaccination units, and pop-up clinics, as well as the necessary ancillary supplies and equipment for maintaining the cold chain requirements for COVID-19 vaccines. CDPH rapidly expanded its vaccination infrastructure, which included upgrading and developing new information systems, creating and disseminating policies and guidance, enlisting healthcare providers, setting up vaccination sites, securing essential supplies, and formulating strategies for vaccine allocation, ordering, and distribution.

To prioritize and distribute vaccines (which were initially very scarce), CDPH established the State's COVID-19 Drafting Guidelines Workgroup, which developed the early allocation frameworks. The State's leadership was also concerned about the public's potential vaccine hesitancy, given that COVID-19 vaccines had been developed, tested, and manufactured in less than one year. To address potential hesitancy and trust in the federal scientific review and approval process, California established and led the Western States Scientific Review Workgroup (which included nationally recognized vaccine experts from California, Oregon, Washington, and Nevada) to review the safety of COVID-19 vaccines authorized for use by the U.S. Food and Drug Administration. This Workgroup confirmed the vaccines' safety and helped to promote public confidence in California's vaccine implementation efforts.

California also established the Community Vaccine Advisory Committee (CVAC), comprised of approximately 77 member organizations, representing diverse constituencies, such as tribes, unions, senior advocates, faith-based organizations, and others. Their role was to provide input to the Vaccine Task Force, including input on equitable vaccine allocation and distribution and how to best communicate with their respective communities. The CVAC met 15 times from late 2020 through mid-2021, and provided input during the meetings as well as hundreds of pages of written public comments. The CVAC established a bi-directional communication channel between the State and leaders within historically under-represented communities and interest groups, and provided a space for diverse representatives of various communities to collectively inform the State's vaccine planning and deployment.

California's lack of mandatory vaccine administration reporting prior to the COVID-19 pandemic led to challenges in monitoring and tracking the vaccine

rollout and contributed to a perception of inefficiency, as the State appeared to lag in national vaccination rate rankings due to under-reporting. In response, California engaged Blue Shield of California as a Third-Party Administrator (TPA) to manage the vaccine provider network, aiming to improve data quality and streamline vaccine distribution. This decision shifted oversight from CalHHS and CDPH to the California Government Operations Agency (GovOps). The TPA's efforts to enhance data reporting and provider enrollment processes marked a significant shift in strategy. However, this shift faced some criticism for altering established public health and LHJ processes used routinely for existing programs such as Vaccines For Children, and potentially complicating vaccine distribution and allocation, highlighting the complexities to rapidly deploy a large-scale Statewide vaccination effort.

As vaccines became more abundant, the State, in association with its federal and local partners, expanded its capabilities to administer vaccines. The Federal Retail Pharmacy Program, launched in February 2021 and continued throughout the pandemic to provide vaccines in large retail pharmacies. In addition, CDPH provided pharmacy and technical support to two State-run mass vaccination sites in Oakland and Los Angeles with support from federal staffing, which offered drive-through and walk-in vaccinations to thousands of Californians. To expand vaccine access for disadvantaged populations CDPH deployed innovative strategies, such as in-home vaccination services, transportation to mass vaccination events, mobile vans, pop-up clinics, and school-located vaccination events. Further, two grant programs, CalVaxGrant and KidsVaxGrant, increased provider enrollment by supporting small practice and pediatric providers.

The VTF also streamlined processes to make it easier for providers to order and manage their vaccine supply. CDPH established an online marketplace so that those providers with excess or expiring inventory could exchange with others who needed additional supply. Additionally, CDPH engaged a third-party distributor to deliver small-dose orders directly to providers. These ordering and distribution mechanisms continued throughout the remainder of the pandemic, which allowed LHJs and providers to optimize their vaccine inventory on hand to address each community's needs.

The State also developed extensive, innovative public communication strategies to encourage all Californians to get vaccinated and to counter vaccine hesitancy and misinformation. CDPH's vaccine education, outreach, and public communications efforts were designed to educate the public about the safety

and efficacy of vaccines and to reach traditionally under-served populations and communities. In addition, the State launched the Statewide Vaccinate All 58 (VA58) campaign to disseminate accurate, relevant, and timely information on COVID-19 vaccines to the public, vaccine providers, LHJs, and elected officials across all 58 counties in California. Finally, the State incentivized the public to get vaccinated via two lottery campaigns that offered prizes and cash giveaways ("Vax for the Win" and "You Call the Shot").

Through these efforts, CDPH successfully led the State's extensive vaccination program in collaboration with its local and State partners. At the height of the vaccination campaign, CDPH was responsible for ordering, tracking, and providing technical guidance on thirteen different versions of the COVID-19 vaccine. Moreover, CDPH oversaw the administration of nearly 90 million vaccine doses by the end of June 2023. This monumental effort significantly contributed to preventing hundreds of thousands of hospitalizations and deaths in California.

Therapeutics

During the pandemic, therapeutic treatments (which, along with vaccines, are referred to as medical countermeasures) played an important role in reducing morbidity and mortality from COVID-19. Intravenous (IV) treatments for patients hospitalized with COVID-19 were available earlier in the pandemic and helped improve inpatient outcomes. Outpatient and oral treatments that were available later in the pandemic helped reduce the risk of hospitalization and death if taken soon after symptom onset.

While vaccines were always recommended as the first line of defense against COVID-19, therapeutics were a very useful form of clinical care for people who could not or would not take vaccines, and there is evidence that these medicines helped reduce risk of hospitalization and death even in vaccinated individuals. Some therapeutic treatments were recommended for immunocompromised individuals before exposure to COVID-19 to help reduce the likelihood of becoming sick. Other treatments could be taken within five to seven days of COVID-19 symptom onset to reduce the risk of hospitalization and death.

There are two forms of COVID-19 therapeutics treatments: antivirals and monoclonal antibodies. Antivirals work by stopping the virus that causes COVID-19 from making copies of itself in the body. Initially antivirals were only available by IV over several days, and eventually oral options became

available. Monoclonal antibodies mimic the body's own antibodies to help stop the symptoms of COVID-19; this treatment is administered to patients through an infusion or injection delivered in a health care setting by a healthcare practitioner.

In May 2020, Veklury became the first COVID-19 monoclonal therapeutic to receive emergency use authorization (EUA), leading the federal government to acquire the national supply for distribution among states. Shortly thereafter CDPH formed a therapeutics work group to promote Veklury's equitable distribution to LHJs and healthcare providers. This system remained in place until October 2020 when Veklury gained FDA approval to be sold in the commercial marketplace, which then ended federal purchases and state allocations. Subsequently, from November 2020 to May 2021, three monoclonal antibody treatments received EUA and were eventually distributed to states in late summer 2021. Consequently, CDPH restructured its therapeutics work group to form the Therapeutics Task Force in October 2021.

While the FDA granted EUAs for five different monoclonal antibody treatments during the pandemic, by the end of 2022 all the authorizations were revoked due to evolution of Sars CoV2 into the Omicron variant which these treatments were no longer effective against. At that time, the two remaining oral antivirals, nirmatrelvir/ritonavir (Paxlovid™) and monupiravir (Lagevrio™), were the primary treatment options allocated to the states until their commercialization in November 2023.

Given this shifting landscape of treatment options and frequent revisions to recommended therapeutics usage, there was a critical need to provide accurate and up-to-date information. The CDPH Therapeutics Task Force prioritized distribution of treatments when scarce initially, and developed and disseminated extensive clinical guidance, educational materials, and communications to assist providers in making informed treatment decisions and to assist the public in understanding the importance of seeking treatment within symptom onset as soon as possible. The Therapeutics Task Force directed several initiatives that successfully expanded options for the public in disadvantaged communities to get tested, obtain a prescription, and receive treatment all at one convenient location (Test-to-Treat).

D. Demobilization

In mid-2021, CDPH leadership began working on a new ICS structure to reorganize all COVID-19 response teams underneath the MHCC umbrella. In December 2021 and January 2022, concurrent with the Omicron surge, CDPH implemented the new ICS structure, known as ICS 2.0. Following the roll-out of ICS 2.0, CDPH response leadership transitioned out of the SOC. However, some CDPH maintained staff at the SOC since it was still activated for the COVID-19 response. CDPH staff who continued working in the SOC represented the department, answered questions, and reported key information back to the department.

As other departments such as the CDT, GovOps, and non-profit entities scaled back their involvement in the response, CDPH transitioned many of the State's public health response activities "in-house." This included determining how to incorporate multiple response teams, including task forces that had originally been formed outside of CDPH.

By mid-2022, major response workstreams had undergone many transitions and some were winding down. CalCONNECT, the Statewide CDPH-led contact tracing program, had largely concluded its COVID-19-specific work by Summer 2022, and the system and staff were transitioned into CDPH to adapt the program to address other gaps in public health response that existed prior to the pandemic. In May 2022, CDPH shut down the State-run PCR processing lab (Valencia Branch Lab) and during the FY 2022-23 budget year the Testing Task Force consolidated and shrank its testing programs. Similarly, the Vaccine Task Force navigated program changes in mid-to-late 2022, including the arrival of boosters and the expansion of the program eligibility to include pediatric populations (ages 6 months to 17 years). Other vaccination programs, including in-home vaccines for homebound Californians and pop-up school-located vaccination clinics, ended in Summer 2022 and oversight of remaining program and subject matter expertise was absorbed into CDPH.

In anticipation of the end of California's COVID-19 state of emergency on February 28, 2023 and the end of the federal state of emergency on May 11, 2023, CDPH continued demobilizing many of its response activities. Historically, the MHCC activated for limited periods of time during emergencies—but for COVID-19, the MHCC was activated for over three years. Planning for demobilization required a shift in thinking, since the MHCC had devoted

considerable energy the previous year to integrating and unifying all CDPH COVID-19 response teams and responders under its organizational umbrella, and continued to oversee hundreds of new staff that had been hired during the pandemic. As part of the demobilization from the response, CDPH leadership considered how to transition from the current state, in which COVID-19 response activities were organized within the MHCC, to a future state, in which response activities would be either discontinued, transitioned to CDPH programs, or transferred to other partner organizations. These deliberations took several months and included many stakeholders and teams.

On June 30, 2023, the MHCC formally deactivated from the COVID-19 response. Its core sections transitioned back to the CDPH Center for Preparedness and Response, while components of its Management and Operations sections transitioned to other CDPH programs (both existing and new) as well as other response partners. CDPH's Center for Infectious Diseases (CID) absorbed many continuing COVID-19 workstreams (involving epidemiology and surveillance) within its newly-formed COVID Control Branch (CCB) to ensure ongoing monitoring of COVID-19.