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# California Legislature

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### Informational Hearing: California's Public Health Infrastructure and Capacity

March 6, 2019 – 1:30pm

John L. Burton Hearing Room (4203)

#### BACKGROUND

The Senate Health Committee is convening state and local public health officials to review California's public health infrastructure and capacity to protect the health of the state's residents. The discussion will focus on providing overviews on the public health system at the state level, the role local health departments (LHDs) play in providing public health services, and challenges in addressing outbreaks and undertreated disease in California's communities. Particular attention will be paid to: emergency preparedness, including the response to recent wildfires; epidemics and reemergence of communicable diseases, including recent hepatitis A outbreaks and an uptick in the incidence of sexually transmitted diseases (STDs); and, how the public health system is working to prevent chronic disease and manage its burden on Californians and the health care system. Finally, the Committee will hear from officials about the need for continued investment in the public health infrastructure.

**Background.** Public health functions are focused on population-based strategies to protect the overall health of the community. According to the American Public Health Association (APHA), the strength of a public health system rests on its capacity to effectively deliver ten essential public health services:

- Monitor health status to identify community health problems;
- Diagnose and investigate health problems and health hazards in the community;
- Inform, educate and empower people about health issues;
- Mobilize community partnerships to identify and solve health problems;
- Develop policies and plans that support individual and community health efforts;
- Enforce laws and regulations that protect health and ensure safety;
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable;
- Assure a competent public health and personal health care workforce;
- Evaluate effectiveness, accessibility and quality of personal and population-based health services; and,
- Research for new insights and innovative solutions to health problems.

According to the federal Healthy People 2020 program, all public health services depend on the presence of basic infrastructure. Every public health program—such as immunizations, infectious disease monitoring, cancer and asthma prevention, drinking water quality, and injury prevention—requires competent health professionals, up-to-date information systems, and public health organizations with the capacity to assess and respond to community health needs. Public health infrastructure has been referred to as “the nerve center of the public health system.” While a strong infrastructure depends on many organizations, public health departments are considered primary players. Federal agencies rely on the presence of solid public health infrastructure at all levels of government to support the implementation of programs and policies and to respond to health threats, including those from other countries.

**California’s public health system.** In California, the Department of Public Health (DPH) is charged with protecting the health of the state’s residents. DPH is comprised of more than 200 programs, which are responsible for a wide range of functions, including: enforcing California’s tobacco control law; assisting in the response to local emergencies; administering federal HIV funds; conducting newborn screening; licensing and certification for health facilities, labs, and certain health care professionals; maintaining vital records for California’s 38 million residents; and, conducting surveillance and research of chronic disease. In addition, DPH is the entity responsible for ensuring the tracking and control of communicable disease for the state. According to DPH’s website, its Division of Communicable Disease Control (DCDC) works to promptly identify, prevent and control infectious diseases that pose a threat to public health, including emerging and re-emerging infectious diseases, vaccine-preventable agents, bacterial toxins, bioterrorism, and pandemics. DPH works with LHDs to implement infectious disease control at the local level through the 61 legally-appointed physician local health officers (LHOs) in California, one from each of the 58 counties and three cities of Berkeley, Long Beach, and Pasadena. The California Conference of Local Health Officers (CCLHO), which is comprised of all LHOs in the state, was established in statute in 1947 to advise DPH, other departments, boards, commissions, and officials of federal, state and local agencies, the Legislature and other organizations on all matters affecting health. The CCLHO program committees consider technical and policy issues in communicable disease control and prevention; chronic disease and injury prevention; environmental health; health equity; and maternal, child and adolescent health. Funding for DPH comes from a variety of sources: 42% of its \$3.218 billion budget comes from special funds (approximately \$1.338 billion) and 46.3% is federal funds (approximately \$1.49 billion).

**LHDs’ role.** LHDs have a broad mandate to take measures necessary to preserve and protect public health. While LHDs administer many of the programs identified under DPH, LHDs have a fundamental role as the front line for delivery of public health services to California’s communities. The structure and size of LHDs vary by jurisdiction, and some include operations such as public hospitals, primary care clinics, and animal control services. Select core functions include:

- Infectious disease control. LHDs prevent and control the spread of infectious diseases through immunizations, epidemiologic surveillance, disease investigation, laboratory testing and response activities.
- Emergency preparedness and response. LHDs work to ensure communities are informed, supplies and medications are accessible, and that there is capacity to expand medical services in large events. In addition, LHDs utilize public health labs to investigate and identify potential bioterrorism

threats. In the event of a disaster, LHDs may staff shelters and screen for infectious diseases and address the needs for medically fragile residents.

- Maternal, child, and adolescent health. LHDs work to identify, disseminate, and promote emerging and evidence-based information about early interventions in prenatal and early childhood periods that promote lifelong health, positive social-emotional development, and reduce health disparities.

**Persistent communicable diseases.** According to DCDC's 2016 Annual Report, communicable diseases place an enormous burden on the health of the people of California. DCDC monitors, prevents, responds to, and develops policy on more than 80 infectious diseases for California. These diseases range from the rare, like hantavirus, to the common, like influenza. DCDC depends on different partners to report disease, including local health departments, laboratories, and health care providers throughout the state. DPH maintains a web-based disease reporting system called the California Reportable Disease Information Exchange (CalREDIE) to enable rapid electronic reports of cases. In 2016, there were approximately 20 million cases of illness due to communicable diseases in this state, which caused more than 10 million chronic infections and approximately 10,000 deaths. During that year, DCDC conducted more than 60,000 laboratory tests, processed approximately 350,000 disease reports, responded to more than 140 outbreaks, and carried out a wide range of preventive activities. Testimony offered at this hearing will primarily focus on the following communicable diseases: tuberculosis (TB), valley fever, STDs, and hepatitis A.

TB. According to the Centers for Disease Control and Prevention (CDC), TB is a disease caused by germs that are spread from person to person through the air and usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine. The general symptoms of TB disease include feelings of sickness or weakness, weight loss, fever, and night sweats. The symptoms of TB disease of the lungs also include coughing, chest pain, and the coughing up of blood. People with latent TB infection (LTBI) have TB germs in their bodies, but they are not sick because the germs are not active. These people do not have symptoms of TB disease, and they cannot spread the germs to others. However, they may develop TB disease in the future. They are often prescribed treatment to prevent them from developing TB disease. People with TB disease are sick from TB germs that are active, meaning that they are multiplying and destroying tissue in their body. These people usually have symptoms of TB disease and are capable of spreading germs to others. They are prescribed drugs that can treat TB disease.

According to DPH's "Report on Tuberculosis in California" in 2017, California reported 2,057 new active TB cases, compared with 2,059 cases in 2016. The incidence rate (5.2 cases per 100,000 persons) is nearly double the national rate of 2.8 cases per 100,000. An estimated more than \$78 million was spent on medical management of TB cases in California during 2017. Among California's TB cases, an estimated 6% were imported from outside the United States, 14% resulted from recent transmission, and 80% were due to progression of LTBI to active TB. More than two million Californians (6% of the population) have LTBI. The TB rate among persons born outside of the U.S. (15.7 per 100,000) was 12 times higher than the rate among U.S.-born persons (1.3 per 100,000). Persons born in Mexico, the Philippines, Vietnam, China, and India accounted for over three-fourths of TB cases in non-U.S.-born persons.

Hepatitis A. Hepatitis A is a liver disease caused by the hepatitis A virus (HAV). Good personal hygiene and proper sanitation can help prevent hepatitis A because the disease is spread by eating

contaminated food, drinking a contaminated drink, and through person-to-person contact. Symptoms can appear abruptly and may include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, diarrhea, joint pain, and jaundice. Vaccines are available for long-term prevention of HAV infection in persons 12 months of age and older. Most persons with acute hepatitis A disease recover with no lasting liver damage and the disease is rarely fatal.

By 2016, transmission of HAV in California and the United States had declined by more than 95% compared to the pre-vaccine era (before 1995) due to widespread childhood vaccination. Reported hepatitis A cases between 2012 and 2016 ranged from a low of 146 cases in 2014 to a high of 254 cases in 2013. However, California experienced a large hepatitis A outbreak in 2017-2018, primarily among persons experiencing homelessness and/or using illicit drugs in settings of limited sanitation. According to DPH, the outbreak in California is now over, but other states continue to experience outbreaks in similar populations of at-risk people. According to the CDC, people most at risk for infection are travelers to regions with intermediate or high rates of hepatitis A, sex contacts of infected persons, household members or caregivers of infected persons, men who have sex with men (MSM), users of certain illegal drugs (injection and non-injection), and persons with clotting-factor disorders.

Valley fever. According to the CDC, valley fever is caused by *coccidioides*, a fungus that lives in soil in the southwestern United States and parts of Mexico, Central America, and South America. Inhaling the airborne fungal spores can cause infection, and is not spread from person to person. Most people who are exposed to the fungus do not get sick, but some people develop flu-like symptoms that may last for weeks to months. In a very small proportion of people who get valley fever, the infection can spread from the lungs to the rest of the body and cause more severe conditions, such as meningitis or even death. While anyone in an endemic area is at risk, those working in occupations involving dirt and dust exposure may be at increased risk of infection. Several groups of people are at higher risk for developing the severe forms of valley fever, including African Americans, Asians, diabetics, and people with weak immune systems, including those with an organ transplant or who have HIV/AIDS. Although most cases of valley fever are not associated with outbreaks, they do occasionally occur, particularly after events that disturb large amounts of soil. Past outbreaks have occurred in military trainees, archeological workers, solar farm workers, and in people exposed to earthquakes and dust storms.

According to DPH data, valley fever incidence in California slowly climbed from 719 in 1998 to a peak in 2011 of 5,697. Those numbers were on the decline until 2016, when the number crept back up to 5,358 reported cases. From January through December 2017, 7,466 new cases of valley fever were reported. According to DPH, the highest valley fever incidence in 2017 were reported in counties in the Central Valley and central coast regions, including Kern, Kings, San Luis Obispo, Fresno, Tulare, Madera, and Monterey counties. Nearly 64% of the 2017 case-patients resided in one of these counties, with 37% residing in Kern County.

STDs. According to DPH, STDs such as chlamydia, gonorrhea, and syphilis are common, often do not have symptoms, and are preventable. Some STDs can be treated and cured, while others result in lifelong infections. Untreated STDs can lead to serious health problems, such as pelvic inflammatory disease, infertility, cancer, and death. Untreated STDs may also increase the risk of being infected with another STD. Similar to many infectious diseases, especially those diseases that might not result in symptoms, persons with STDs often do not know they are infected or seek health care services. Even if persons with STDs are diagnosed, they might not be reported. Based on available estimates, California

rates for reported STDs were higher than national rates for all three STDs in 2016. California ranked 20th highest among all states for chlamydia, 14th highest for gonorrhea, and 3rd highest for primary and secondary syphilis rates. Racial and ethnic minorities have disproportionate rates of all three STDs. The following populations are vulnerable to STDs: MSM continue to account for the majority of early syphilis cases as well as nearly two thirds of gonorrhea cases among men; young people account for the largest proportion of chlamydia and gonorrhea infections; gonorrhea and chlamydia rates among African American adolescent and young adult women are significantly higher than among other race/ethnic groups; and, African American MSM rates of early syphilis are higher than among other race/ethnicity groups.

Congenital syphilis occurs when the disease is transmitted from an infected mother to her fetus during pregnancy. It is a potentially devastating disease that can cause severe illness in babies, including premature birth, low birth weight, birth defects, blindness, and hearing loss. It can also lead to stillbirth and infant death. Congenital syphilis can be prevented with early detection and timely and effective treatment of syphilis in pregnant women and women who could become pregnant. Based on national data for 2016, California ranked 2nd highest in the country for the rate of congenital syphilis, and this rate is 4.6 times higher than the Healthy People 2020 target of 9.1 per 100,000 live births. In 2016, 207 cases of congenital syphilis were reported in California, which is a rate of 42.4 new cases per 100,000 live births. This is the highest rate since 1997.

**Chronic disease.** According to the CDC, chronic diseases are defined broadly as conditions that last one year or more and require ongoing medical attention or limit activities of daily living or both. Most chronic diseases are caused by a short list of risk behaviors, including tobacco use and exposure to secondhand smoke, poor nutrition, lack of physical activity, and excessive alcohol use. Chronic conditions are the leading cause of death and disability in the U.S., and the biggest contributor to health care costs. However, there is wide variation in their incidence, with major differences depending on age, income, race and ethnicity, and insurance status. According to an April 2015 report from the California Health Care Foundation (CHCF), about 40% of California adults reported having at least one of the following five chronic conditions: asthma, diabetes, heart disease, high blood pressure, and serious psychological distress. High blood pressure is the most common chronic condition among Californians, affecting about one in four (7.6 million) adults in California. The CHCF report states that as household income rises, the prevalence of chronic conditions falls. Adults living under 138% of the federal poverty level (FPL) were more likely to have two or more chronic conditions (14%) than those in the highest income group, 400%+ FPL (8%). Many people with chronic conditions delay getting needed care. Of Californians with serious psychological distress, 34% delayed needed medical care, and 27% delayed filling prescriptions. Cost or lack of insurance was frequently cited as the reason for these delays. The prevalence of chronic conditions also increases with age: of Californians age 65 or older, 70% have at least one chronic condition, compared to 26% of those age 18 to 39. Finally, the proportion of California adults with chronic conditions varies by geographic region. About 45% of adults in the Inland Empire, San Joaquin Valley, and Northern and Sierra Counties had at least one chronic condition, compared to 36% of adults in Orange County, for example.

**Climate change.** According to a November 2018 Senate Office of Research report, environmental changes resulting from climate change have important implications for public health. In 2016, the APHA deemed climate change “the greatest threat to public health.” Climate change is a global phenomenon, but its effects on different regions around the world will vary. For California, there is greater likelihood

of heat waves, droughts, reduced snowpack, large wildfires, and extreme storms with heavy precipitation and flooding. The associated impacts on human health may be direct, such as deaths, illnesses, and injuries from extreme weather events, or may be indirect, such as by altering the environment in ways that affect public health.

Of all weather-related deaths in the nation, extreme heat is the top contributor. Many illnesses are made worse from hotter temperatures, especially for patients with heart and lung disease, diabetes, asthma, and kidney complications. Children, the elderly, and disadvantaged communities are the most vulnerable populations impacted by heat-related illnesses. Other weather patterns, such as temperatures, precipitation, wind, and humidity, are influenced by climate change and affect the underlying mechanisms of air quality. These weather changes also exacerbate naturally occurring emissions, such as smoke from wildfires and wind-blown dust. Poor air quality can have a range of adverse effects on human respiratory and cardiovascular systems. Other health impacts are at risk as well, such as allergies, since airborne allergen concentration and distribution are anticipated to grow under climate change.

Weather and long-term climate trends can also influence human health by changing how communities are exposed to and contract infectious disease. Disease vectors are insects or animals that carry and transmit pathogens that cause sickness in people. The most common vectors are mosquitos, ticks, fleas, and rodents. Insects and the microbes they carry often die in the winter, maintaining a check on population growth, which will change with warmer conditions. Rainfall also may influence the transmission of disease by affecting survival rates, vector behavior, and pathogen virulence. Current research related to climate change and disease is focused on the following: Lyme disease (transmitted by tick), West Nile virus (mosquito), dengue fever (mosquito), Rocky Mountain spotted fever (tick), plague (flea and rodent), tularemia (tick and deer fly), Chagas (triatomines or “kissing bugs”), chikungunya (mosquito), and Rift Valley fever viruses (mosquito).

Higher temperatures, rising sea levels, and the increased frequency and duration of drought conditions in California mean reduced snowpack, greater evaporation of surface waters, and seawater intrusion (the movement of ocean water into fresh groundwater supplies). As a result, access to clean water for drinking, cooking, sanitation, and irrigation is expected to be reduced. Extreme storms with heavy precipitation can result in storm runoff from agricultural and urban areas, causing agricultural pesticides and bacteria and viruses from human and animal waste to spread into surface waters, ground water, and coastal waters. Water-borne pathogens currently cause 8.5% to 12% of acute gastrointestinal illness cases nationwide, affecting 12 to 19 million people annually. About 68% of outbreaks have been preceded by extreme precipitation events. Higher water temperatures are also expected to promote the growth of toxic algal blooms that can occur in coastal waters. Higher ambient temperatures associated with climate change will mean faster growth of numerous foodborne pathogens, including Salmonella, Campylobacter, and E. coli.

With regard to mental health impacts, during and following weather-related disasters, communities are vulnerable to heightened cases of clinical post-traumatic stress disorder (PTSD), depression, and general anxiety. Heat has also been documented as posing a significant threat to individuals with preexisting mental health diagnoses. As the frequency of extreme weather events increases alongside episodes of elevated temperatures, cases of acute and chronic psychological distress will be more common. Some populations are more vulnerable to adverse mental health outcomes, including children, the elderly,

economically disadvantaged, communities more reliant on the natural environment for sustenance and livelihood (including tribal communities and those in agricultural or fishing industries), and people with preexisting mental illness.

**Potential solutions and investments.** According to the Public Health Leadership Forum’s December 2018 white paper, *Developing a Financing System to Support Public Health Infrastructure*, “Public health deficiencies anywhere jeopardize the health and security of the nation. Disasters natural and man-made can happen anywhere; disease outbreaks do not recognize political boundaries; and the costs of poor health outcomes that can be prevented by public health intervention are borne nationally through expenditures in the publicly funded health care systems. To effectively respond to emergencies such as pandemics or natural disasters and to address pervasive health challenges like diabetes and heart disease, federal, state, local, territorial and tribal officials need a predictable minimum capacity in every part of the country.” Key areas to consider when exploring how to support the state’s public health infrastructure include funding, workforce development, and investments to enhance critical capabilities:

- **Funding.** California’s public health infrastructure has heavily relied on the use of federal funding, categorical grant programs, and, for LHDs, 1991 health realignment. Federal investments have varied over the years and often create silos, leading to disease-specific investments but ignoring the system as a whole. Similarly, surges in state funding (such as revenues provided through tobacco taxes) are also restrictive and cannot be used to broadly to enhance the infrastructure of DPH or LHDs. Alternatively, 1991 health realignment funding is a more flexible source of funding for LHDs, but is currently about \$130 million below 2006 revenues and has experienced diversions in response to other priorities.
- **Workforce.** A 2018 study conducted by the National Association of City and County Health Officials noted significant challenges in maintaining a viable workforce for public health. Many public health positions are specialized and difficult to recruit for, particularly in rural areas. For example, public health nurses must be registered nurses (RNs) and obtain their public health nurse certification. Public health nurses’ earning potential is less than RNs working in other settings.
- **Critical Capabilities.** There are critical capabilities and expertise, such as enhanced technology, within the public health infrastructure that need to be addressed in order to maintain a robust public health infrastructure. Additionally, some of the public health system’s current capabilities are threatened. For example, public health laboratories play an essential role in protecting the health of residents and are critical in providing a timely response. Public health labs work around the clock to perform testing needed to identify threats and have a direct line of communication with DPH and LHDs. However, over the last ten years, ten public health labs have closed due to funding challenges.