

Get Screened California

LUNG CANCER SCREENING ENVIRONMENTAL SCAN

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Project Background

In 2021, the American Cancer Society (ACS) and partners launched a multi-faceted *Get Screened* national initiative to improve cancer screening rates through local and regional stakeholder engagement and action. The *Get Screened* initiative was developed in response to the COVID-19 pandemic's impact on cancer screening. California was awarded an ACS *Get Screened* grant¹ and ACS field staff in California partnered with the state cancer coalition, the California Dialogue on Cancer (CDOC) to tailor strategies specific to California's diverse population. CDOC is the state cancer coalition administered by the California Comprehensive Cancer Control Program under the California Department of Public Health. CDOC is charged with developing and implementing a state cancer plan that includes goals and objectives to decrease the cancer burden in the state. In 2021, ACS and CDOC formed an ad-hoc cancer screening workgroup and pursued efforts aimed at increasing screening rates for all recommended cancer screenings. In 2022, the ACS/CDOC cancer screening workgroup chose to focus specifically on lung cancer screening².

Why Lung Cancer Screening?

Lung cancer is the leading cause of cancer deaths in the U.S. and in California, killing more people than colon, breast, and prostate cancers combined. While not all cases of lung cancer are caused by smoking, smoking is the most significant risk factor for developing lung cancer. Annual lung cancer screening with low-dose computed tomography (LDCT) is the only proven early detection procedure to reduce lung cancer mortality for individuals at high-risk for lung cancer due to their smoking history. The five-year relative survival rate for lung cancer is 60% when diagnosed at a localized stage, however, only 24% of lung cancer cases are diagnosed early. Screening offers the opportunity to increase survival rates and improve quality of life with earlier diagnosis, but screening rates remain low, with a national average rate of 5.8%. California is among the lowest in the nation for lung cancer screening, with an estimated screening rate of 1% (2). Given the low rate of lung cancer screening in California, *California's Comprehensive Cancer Control Plan, 2021-2025 (28)* developed by CDOC includes a lung cancer screening objective.

Context On This Environmental Scan

Given the inclusion of lung cancer screening in the California state cancer plan and the clear work that there is to do to increase uptake of lung cancer screening to save lives, the ACS/CDOC ad-hoc cancer screening workgroup members chose to focus on lung cancer screening in 2022. While the available funding was limited to 2022, part of the group's objective throughout the year was to explore the potential for future statewide collaborations that ACS and CDOC might lead or participate in to advance lung cancer screening in California.

It should be mentioned that while the ACS has been at the forefront nationally with lung cancer screening, this area of work was new for ACS field staff in California. Nationally, ACS worked with the

¹ This work was funded in part by the various funders of the American Cancer Society's Get Screened campaign.

² We will be referring to lung cancer screening interchangeably with LCS.

National Cancer Institute (NCI) to launch the National Lung Cancer Screening trial that supported the efficacy of lung cancer screening with LDCT and issued a lung cancer screening guideline in 2013 based on those findings. Additionally, in 2017, ACS launched the American Cancer Society National Lung Cancer Roundtable (NLCRT), a consortium of public, private, and voluntary organizations working to reduce lung cancer mortality through various efforts including lung cancer screening. However, in California, ACS team members were just beginning to engage in work to address lung cancer screening with health system partners.

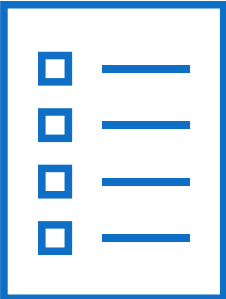

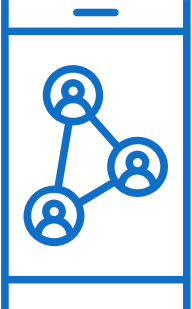
Recognizing the need to get a “lay of the land” of lung cancer screening in California, the ACS/CDOC workgroup decided to conduct an environmental scan. Environmental scans are used in public health and other business and medical organizations to assess internal and external strengths, challenges, and threats. For our purposes, the workgroup chose to use the environmental scan process to collect, organize, and analyze information relating to lung cancer in California in order to determine future strategies and plans. We’ve compiled lung cancer incidence and mortality data from the California Cancer Registry, available lung cancer screening data from multiple sources, information about the history of lung cancer screening and current guidelines and insurance coverage, and themes from interviews with key informants about barriers and opportunities for lung cancer screening in California. The ad-hoc CDOC/ACS cancer screening workgroup intends to disseminate this environmental scan to drive action among California stakeholders, and also to use the information collected to help determine the potential role ACS and CDOC can play to advance lung cancer screening in future years.

Purpose: *To summarize the current state of lung cancer screening in California, identify barriers and opportunities for improving lung cancer screening, and recommend strategies for improving screening uptake.*

Scope: *This environmental scan will be an initial assessment of available lung cancer and lung cancer screening data in California and of the opinions and experiences of select key California stakeholders. This is not a comprehensive summary of the lung cancer screening activities underway in the state. We intend to use this information to make recommendations for key stakeholder groups and to help determine potential roles for ACS and CDOC to play to advance lung cancer screening in California.*

In addition to this 2022 environmental scan, the workgroup decided to utilize 2022 funding (\$15,000) to host a *Get Screened California: Increasing Lung Cancer Screening Virtual Forum* and to plan a #GetScreenedCA Lung Cancer Screening social media campaign in November 2022.

ACS/CDOC Workgroup 2022 Workplan – Lung Cancer Screening

Enviromental Scan	Stakeholder Meeting	Social Media Campaign
 <ul style="list-style-type: none">•Objective: To summarize the current state of lung cancer screening and identify barriers and opportunities for improving lung cancer screening in California. Lay the groundwork for continued work on lung cancer screening in California in 2023 and beyond.•Status: This document was published in February 2023.	 <ul style="list-style-type: none">•Objective: Conduct a statewide stakeholder meeting targeting clinicians and health systems that are in a position to recommend lung cancer screening and/or implement efforts to improve LC, as well as community organizations that can assist with public awareness.•Status: Meeting took place November 10, 2022. Recording available at getscreenedca.org.	 <ul style="list-style-type: none">•Objective: Conduct a #GetScreenedCA lung cancer screening social media campaign in Novmeber 2022. Geo-target counties with high late-stage incidence of lung cancer and/or high smoking rates.•Status: Social Media toolkit available at getscreenedca.org. The campaign reached over 1.5 million people with over 6 million impressions!

This Environmental Scan report represents the work of workgroup members from the American Cancer Society, California Department of Public Health, and City of Hope. Please reference the Acknowledgements section for a list of workgroup members.

Lung Cancer in California

Incidence and Mortality

Lung cancer remains the foremost cause of death worldwide among all cancers (1) and is the leading cause of cancer deaths in the U.S and in California, killing more people than colon, breast, and prostate cancers combined. In California in 2019 (the most recent year for which data is available), the lung cancer incidence rate was 37.8 per 100,000 (17,188 cases) and the mortality rate was 23.5 per 100,000 (10,653 deaths). While California's lung cancer incidence and mortality rates are lower than national averages (2), the very large population of the state makes California second only to Florida in number of lung cancer cases and deaths (3).

Lung cancer incidence and mortality rates in California vary considerably by race/ethnicity. As seen in Table 1, in 2015-2019, the overall incidence rate for lung cancer in California was 39.3 per 100,000. The lung cancer incidence rates were highest among Black, non-Hispanics (50.0 per 100,000) and American Indian and Alaska Natives (48.5 per 100,000); respectively, 10 percent and 7 percent higher compared to the rate for White, non-Hispanics (45.2 per 100,000).

In 2015-2019, the overall lung cancer mortality rate in California was 26.6 per 100,000. Among all racial/ethnic groups, American Indian and Alaska Natives had the highest rate for mortality from lung cancer at 62.9 per 100,000; 69 percent higher compared to the rate among White, non-Hispanics (30.5 per 100,000). The lung cancer mortality rate for Hispanics (15.7 per 100,000) was 64 percent lower compared to the rate among White, non-Hispanics.

Although data for lung cancer incidence and mortality among racial/ethnic groups are limited when distributed at the county level, among White, non-Hispanics, age-adjusted incidence and mortality rates observed for lung cancer were highest in Yuba County (79.9 and 58.6 per 100,000, respectively) compared to other counties. The lung cancer incidence rate for White, non-Hispanics diagnosed in Yuba County was 55.5 percent higher, while the lung cancer mortality rate for the same population group was 63 percent higher when compared to the lung cancer incidence and mortality rates among the White, non-Hispanic group in California overall.

For more information on our analysis of geographic differences in lung cancer incidence and mortality throughout the state, refer to the Lung Cancer Screening Locations: Geospatial Mapping section of this document.

Table 1. Incidence and Mortality Data by Race/Ethnicity and County, data is from 2015-2019 (California Cancer Registry, 2019)

	Non-Hispanic White		Non-Hispanic Black		Hispanic		Asian/Pacific Islander		American Indian	
	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality
	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate
California	45.2	30.5	50	35.8	23.5	15.7	34.4	22	48.5	62.9
CA: Alameda County (06001)	39	25.3	54.3	37.6	27.2	16.8	35.3	22.4	^	66.1
CA: Alpine County (06003)	^	^	^	^	^	^	^	^	^	^
CA: Amador County (06005)	53.2	37.9	^	^	^	^	^	^	^	^
CA: Butte County (06007)	56.1	39.1	^	^	32.1	21.2	^	^	73.8	^
CA: Calaveras County (06009)	47.3	33.7	^	^	^	^	^	^	^	^
CA: Colusa County (06011)	64.5	39.6	^	^	^	^	^	^	^	^
CA: Contra Costa County (06013)	41.2	27.8	53.1	35.7	28	17.1	33.3	20.2	^	84.7
CA: Del Norte County (06015)	55.6	37.9	^	^	^	^	^	^	^	^
CA: El Dorado County (06017)	38.5	28.2	^	^	27.1	^	28.1	^	^	^
CA: Fresno County (06019)	51.9	34.7	72	49.3	24.9	16.1	26.8	22.1	64.2	44.3
CA: Glenn County (06021)	61.5	51.9	^	^	^	^	^	^	^	^
CA: Humboldt County (06023)	52.8	36.3	^	^	37.6	^	^	^	58.1	48.4
CA: Imperial County (06025)	56	32.2	^	^	26.5	13.9	^	^	^	^
CA: Inyo County (06027)	46.8	30.8	^	^	^	^	^	^	^	^
CA: Kern County (06029)	55.7	39.1	63	44.3	23.1	15.4	27.7	21.7	55.6	79.8
CA: Kings County (06031)	52.2	44.4	^	^	24.4	16.3	^	^	^	^
CA: Lake County (06033)	68.6	45.9	^	^	46	^	^	^	^	^
CA: Lassen County (06035)	39.6	31.1	^	^	^	^	^	^	^	^
CA: Los Angeles County (06037)	42.6	29.1	49.6	37.3	20.9	15	33.7	22.5	22.3	52.9
CA: Madera County (06039)	47.7	35.7	64.6	^	22	16.9	^	^	^	^
CA: Marin County (06041)	33	19.6	62.1	51.8	27.4	^	38.3	23.4	^	^
CA: Mariposa County (06043)	41.9	30.3	^	^	^	^	^	^	^	^
CA: Mendocino County (06045)	45.4	32	^	^	^	^	^	^	^	^
CA: Merced County (06047)	58.5	46.7	67.3	48.5	24.9	15.7	^	^	^	^
CA: Modoc County (06049)	37	29.6	^	^	^	^	^	^	^	^
CA: Mono County (06051)	24.8	^	^	^	^	^	^	^	^	^
CA: Monterey County (06053)	37.9	26	49.3	28.8	19.2	15.2	30	21.7	^	^
CA: Napa County (06055)	42.4	28.9	^	^	27	16.6	38.1	26.9	^	^
CA: Nevada County (06057)	35.8	26.6	^	^	^	^	^	^	^	^
CA: Orange County (06059)	42.6	27.3	31.1	26	24.1	16.7	35.9	22.2	35.2	70.3
CA: Placer County (06061)	42.7	29.1	^	^	21.7	13.8	31.2	10.8	^	^
CA: Plumas County (06063)	46	35.4	^	^	^	^	^	^	^	^
CA: Riverside County (06065)	46.4	33.4	40.3	32	22.3	16.5	29.9	21.2	48.4	52.2
CA: Sacramento County (06067)	55.7	34.9	53.3	36.8	30.7	19.2	34.7	22.4	74.9	97.6
CA: San Benito County (06069)	40.6	33.1	^	^	20.4	18	^	^	^	^
CA: San Bernardino County (06071)	49.4	38.4	45.3	34	23.7	15.1	29.2	21.3	38.3	80.8
CA: San Diego County (06073)	46.2	28.7	46.1	27.4	26.3	16.2	35.7	23.9	59.4	72.5
CA: San Francisco County (06075)	42	23.6	67	42.7	25.8	15	43.5	26.6	^	^
CA: San Joaquin County (06077)	53.8	35.9	58.1	43.2	25.9	18.6	38.7	22.2	68.5	97.8
CA: San Luis Obispo County (06079)	42.6	27.9	^	^	35	21.4	28.9	^	^	^
CA: San Mateo County (06081)	39.3	24	38.7	26.4	26.9	17.3	35.7	18.7	^	^
CA: Santa Barbara County (06083)	40.4	25.4	48.8	^	25.5	16.5	33.9	21.4	^	^
CA: Santa Clara County (06085)	39.1	25	43.2	22.1	24.6	14.7	32.5	19.2	^	^
CA: Santa Cruz County (06087)	37	25	^	^	22.7	13.8	43.8	26.4	^	^
CA: Shasta County (06089)	60.9	39.9	^	^	24.6	^	^	^	119.8	121.6
CA: Sierra County (06091)	^	^	^	^	^	^	^	^	^	^
CA: Siskiyou County (06093)	51.5	39.8	^	^	^	^	^	^	^	^
CA: Solano County (06095)	56.1	38.7	56.9	40.2	30.3	19.3	35.7	19.3	^	^
CA: Sonoma County (06097)	40.5	29	41.8	^	22.1	16.1	37.2	23.8	^	53.7
CA: Stanislaus County (06099)	55.4	41.5	64.7	41.1	28.4	18.9	39.2	23.6	71.9	114.9
CA: Sutter County (06101)	64.6	44.2	^	^	20.6	20.2	24.2	^	^	^
CA: Tehama County (06103)	57.5	39.1	^	^	^	^	^	^	^	^
CA: Trinity County (06105)	61.7	46	^	^	^	^	^	^	^	^
CA: Tulare County (06107)	46.7	39.1	^	^	19	12.8	35.8	18.5	^	^
CA: Tuolumne County (06109)	50.3	35	^	^	^	^	^	^	^	^
CA: Ventura County (06111)	42.6	28.3	47.1	34.1	25.1	14	32.9	18.9	^	^
CA: Yolo County (06113)	48.1	30.9	71.7	^	26.2	14	24	20.4	^	^
CA: Yuba County (06115)	79.9	58.6	^	^	36	^	^	^	^	^

Rates are per 100,000 and age-adjusted to the 2000 US Std Population (19 age groups - Census P25-1130) standard

~ Statistics could not be calculated

^ Statistic not displayed due to fewer than 15 cases

Survival Rates

The overall five-year relative survival rate for lung cancer patients in California is 22.4 percent. Racial disparities for lung cancer survival exist, with data indicating American Indian and Alaska Natives having the lowest five-year relative survival rate (18.6 percent) and Asian and Pacific Islanders having the highest five-year relative survival rate (25.6 percent) compared to other racial/ethnic groups (Table 2).

Table 2. The 5-Year Survival Rate of patients by Ethnicity data is from 2010-2019 (California Cancer Registry, 2019).

	12 mo	24 mo	36 mo	48 mo	60 mo
California	49.00%	35.70%	29.10%	25.20%	22.40%
Non-Hispanic White	47.70%	34.70%	28.50%	24.90%	22.30%
Non-Hispanic Black	46.00%	31.90%	25.50%	21.50%	18.90%
Hispanic	47.00%	33.90%	27.20%	23.50%	20.90%
Asian/Pacific Islander	57.90%	43.50%	35.00%	29.40%	25.60%
American Indian	44.30%	29.60%	24.10%	21.10%	18.60%

Confidence interval: Log(-Log()) Transformation. The level is 95%.
The relative cumulative survival is over 100 percent and has been adjusted.

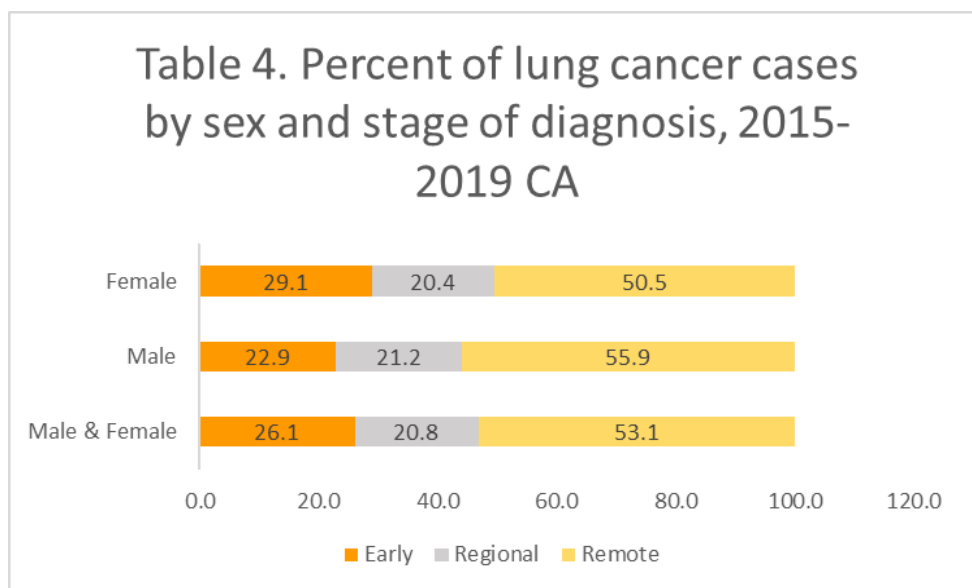
Stage of diagnosis is an important predictor of lung cancer survival (Table 3). Among California females, diagnosis for lung cancer at localized stage has the best five-year relative survival rate (66.6 percent), whereas in females diagnosed with remote or distant stage of the disease, the five-year relative survival rate is poor (8.4 percent). Among California males diagnosed with lung cancer with localized disease, the five-year relative survival rate is 56.6 percent, while those diagnosed with remote stage have a five-year relative survival rate of only 5.5 percent.

Table 3. The 5-Year Survival Rate of patient Diagnosis at various stages in LC by Year and Sex, data is from 2010-2019 (California Cancer Registry, 2019).

	Localized		Regional		Remote	
	Female	Male	Female	Male	Female	Male
12 mo	88.30%	83.40%	70.50%	63.70%	35.60%	28.30%
24 mo	80.70%	73.40%	56.40%	46.80%	20.80%	14.80%
36 mo	75.20%	66.30%	47.70%	38.20%	14.30%	9.50%
48 mo	70.90%	60.50%	42.20%	33.10%	10.50%	7.00%
60 mo	66.60%	56.60%	38.10%	29.00%	8.40%	5.50%

Actuarial method. Ederer II method was used for cumulative expected.
Confidence interval: Log(-Log()) Transformation. The level is 95%.
The relative cumulative survival is over 100 percent and has been adjusted.

Despite improved survival for lung cancer diagnosed early, in California only 26.1% of patients diagnosed from 2010-2019 were diagnosed at a localized stage (Table 4). Nationally, 26% of patients are diagnosed at an early stage, when survival is much higher (61% survival rate nationally) (2). In California, the early detection rate for males is significantly lower (Table 4). Non-Hispanic whites in California are above the national average for early-stage diagnosis (27.9%), while Hispanics experience the lowest rate of early diagnosis (22.3%) among other race/ethnic groups. California falls in the “average tier” (2) for early detection of lung cancer and there is a lot of room to find more lung cancers early through lung cancer screening.



Note: Early stage defined as combined in situ and localized stages.

California Cancer Registry (www.ccrca.org), California Department of Public Health. SEER*Stat Database: Incidence - California, Dec 2021 (1988-2019) (Corrected), 03/15/2022; Benchmarked 1988-1989 DOF population estimates, 6/12/2006; NCHS population estimates 1990-2019.

Lung Cancer Screening

History

While not all cases of lung cancer are caused by smoking, smoking is the most significant risk factor for developing lung cancer. Roughly 90% of all lung cancer cases have been attributed to smoking, increasing a person's susceptibility by 20-fold (4). However, lung cancer diagnosed at an early stage is more amenable to treatment. Improving lung cancer screening accessibility and uptake will be paramount in decreasing mortality rates and improving survivorship.

LDCT has been shown as a successful screening method since the 2002 National Lung Screening Trial which showed its benefit over previously employed CT scans for diagnosing lung cancer (26). The history of lung cancer screening is extensive and the Go2 Foundation for Lung Cancer, a non-profit organization founded by lung cancer patients and survivors, has information on the history of lung cancer screening on their website: [link](#) (27).

Guideline Recommendations

From the results demonstrated in the National Lung Cancer Screening trial, the USPSTF conducted an evidence review and in 2013, recommended (with a "B" rating) that high-risk patients should be screened yearly for lung cancer by utilizing LDCT. Under the Affordable Care Act, recommendations that receive an A or B rating must be covered by most private health insurance plans and Medicaid expansion plans (screening under Medicare discussed below) with no out-of-pocket costs. The recommendation in 2013 was instrumental in expanding lung cancer screening accessibility to marginalized people. However, the recommendation required patients to be (at least) 55 and have a 30 pack-years smoking history. At the time of the initial recommendation in 2013, roughly 8 million Americans were eligible for LCS.

The updated USPSTF recommendation that was announced in March of 2021 is estimated to increase the eligibility of lung cancer screening to 14.5 million Americans (4). The significant changes from the 2013 recommendations include: (1) lowering the initiation age for screening from 55 to 50 and (2) lowering the pack-year smoking history from 30 to 20 pack-years.

Other major organizations including the American Cancer Society, American Academy of Family Physicians, and American College of Chest Physicians recommend lung cancer screening for high-risk individuals. The American Cancer Society guideline is currently under revision and when published will be available [here](#).

BRIEF COMPARISON: 2021 AND 2013 USPSTF LUNG CANCER SCREENING RECOMMENDATION STATEMENTS				
	AGE TO START	AGE TO STOP	PACK-HISTORY	Estimated # of Individuals Eligible for LCS¹
USPSTF 2021	50	80, or once 15 years since year quit is reached	20 Pack-Years	14.5 million Americans
USPSTF 2013	55*	80, or once 15 years since year quit is reached	30 Pack-Years	8.0 million Americans

**National Lung Screening Trial (NLST) Criteria: Most early guidelines were similar to the NLST eligibility criteria, i.e., an individual who currently smokes or who has quit within 15 years, aged 55-74 with 30 pack-year or greater smoking history. The USPSTF 2013 recommendations differed by extending the age for screening eligibility from age 74 to age 80. For more information on the NLST: [Link](#)*

Note: Although other factors are associated with lung cancer risk, such as family history and environmental and occupational exposures, the USPSTF recommendation statement solely focuses on age and a person’s history of tobacco use.

The updated recommendation includes more women, Blacks, Asians, and Hispanic/LatinX individuals as eligible for screening. This is important because although smoking is less than white adults, there is evidence that Black adults who smoke are at higher risk for lung cancers (despite their lower pack-years history) (5). Similarly, LatinX individuals who smoke often accumulate fewer pack-years history than white individuals who smoke, and women accumulate fewer pack-years history than men. By lowering the pack-year history, there will be an increase in the number of high-risk adults eligible for LCS (5).

Insurance Coverage

Private

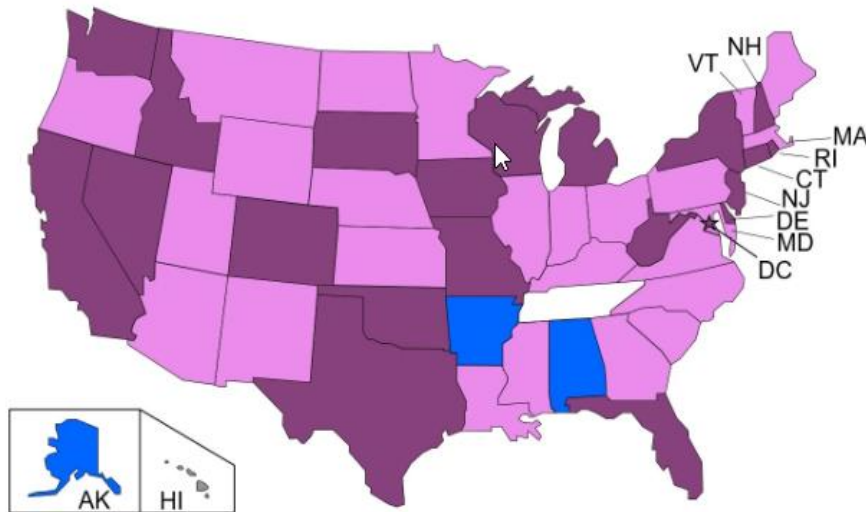
Under the Affordable Care Act, all non-grandfathered private insurance plans and Medicaid expansion plans must provide coverage (without cost-sharing) of preventive services that receive an “A” or “B” rating from the USPSTF. Most private and Medicaid expansion plans in the U.S. are thus required to provide coverage according to the current USPSTF recommendation beginning in the plan year that begins on or after one year from the date the recommendation was issued (March 2021). Thus, most plans were required to adopt the new recommendation as of January 1, 2023, but many private health plans chose to adopt the recommendation earlier.

Medicaid

Preventive services given an “A” or “B” by the USPSTF are NOT mandated services under traditional Medicaid. States can elect to cover these services as optional benefits. LDCT lung cancer screening is considered an optional service, not a mandatory service, which means that coverage for the traditional Medicaid population varies by state as seen in the American Lung Association map below. In California, Medi-Cal (California’s Medicaid program) covers LDCT lung cancer screening and is using the updated guidelines.

State Medicaid Fee-For-Service Coverage of Lung Cancer Screening

■ Covered and Using Updated Guidelines ■ Covered ■ No Coverage ■ Not Available □ No FFS Program



Updated July 2022

American Lung Association

Source: <https://www.lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer/saved-by-the-scan/resources/state-lung-cancer-screening>

Medicare

Medicare's process for coverage of preventive screenings, including lung cancer screening, is different from that of private insurance or Medicaid. Medicare covers lung cancer screenings through a National Coverage Determination (NCD), which was updated on February 10, 2022. Medicare's new coverage decision reflects the trend of initiating lung cancer screening at a younger age and with lighter smoking histories. The NCDs are decided through an evidence-based protocol, with opportunities for public input. Medicare's new Decision Memo for Screening for Lung Cancer with Low Dose Computed Tomography (LDCT) (CAG-00439R) can be found here: [Link](#)

Medicare now covers annual lung cancer screening for their beneficiaries who are asymptomatic, aged 50-77, who have a 20+ pack-year history of smoking, who currently smoke, or if formerly smoked, have quit within 15 years, and receive an order for lung cancer screening with LDCT. The coverage does not align with the recommended screening guidelines as the USPSTF recommends for those aged 50-80, which creates a coverage gap for those between the ages of 78-80 years.

The CMS mandates shared decision-making for reimbursement coverage of lung cancer screening, which is a collaborative process between healthcare provider and patient on the potential harms and benefits to a low dose CT scan. The changes implemented simplified some of their prior requirements for shared-decision-making and eliminated some requirements for the reading radiologist. The new policy removes the restriction that the shared-decision visit must be executed by a physician or non-physician practitioner. Additionally, the new NCD also requires radiology imaging facilities to utilize standardized reporting systems. The new policy took effect upon its announcement in July 2022 in accordance with CMS policy and regulations.

Problems with insurance coverage, remaining uninsured, and downstream costs

While California now has robust insurance coverage for lung cancer screening in accordance with current guidelines, there continue to be cost and insurance-related challenges. As will be discussed later in the key informant interview themes, patients and providers experience challenges such as required prior-authorizations, health system coding challenges, patient uncertainty about the screening being covered, and insurance not being accepted at the institution where the patient is seeking care. Additionally, there remain uninsured individuals even in California where Medicaid was recently expanded to include undocumented adults (6).

Uninsured individuals (including undocumented individuals) can obtain access to other recommended cancer screenings through national programs funded by the federal government and administered by states (i.e. the CDC's National Breast and Cervical Cancer Early Detection Program and the CDC's Colorectal Cancer Control Program), but such a program does not currently exist for lung cancer screening.

Additionally, while much of the discussion around insurance coverage for cancer screening often centers around the initial screening test, there are out-of-pocket costs after positive screening that can cause uncertainty and concern for patients and thus be barriers to the uptake of screening. One of the priorities of the policy workgroup for the ACS National Lung Cancer Roundtable is expanding the coverage policy for a lung screening episode to eliminate cost share burden for downstream work-up after a positive LDCT.

Lung Cancer Screening Data: Screening Rates and Screening Locations

Despite recommendations for screening by the USPSTF, ACS, National Comprehensive Cancer Network, and other organizations, lung cancer screening uptake remains low. In California, it is estimated that 1% of those at high risk have been screened, which is significantly lower than the national rate of 6% (2), ranking California 50th among all states.

The 1% estimate is from the frequently cited American Lung Association's 2022 State of Lung Cancer Report, and while it is no doubt a valuable estimate, there are a few limitations to note. The estimate was determined by dividing the number of screening exams reported in California that met USPSTF criteria by the estimated number of people at high risk for lung cancer and thus recommended for LDCT scans. The number of screening exams came from the American College of Radiology (ACR) National Lung Cancer Screening Registry (NLCSR), which does not collect data from some large managed care

providers. This is discussed in further detail below (7) and may signify an underrepresentation of the lung cancer screening rate in California. For more information on the methodology used for the ALA State of Lung Cancer state estimates, including the model used to calculate the denominator of eligible individuals, [click here](#).

In the sections that follow, we summarize current and soon-to-be available sources of lung cancer screening data (ACR Lung Cancer Screening Registry, National Health Interview Survey, Behavioral Risk Factor Surveillance System, HEDIS), and we present a preliminary geospatial map of lung cancer screening locations in the context of county-level incidence and mortality for lung cancer.

ACR Lung Cancer Screening Registry (LCSR)

In an effort to broaden access to at-risk populations, in February of 2022, Medicare expanded coverage of lung cancer screening. Until recently, Medicare required data submission to an approved clinical practice registry as a condition for reimbursement for lung cancer screening exams. The American College of Radiology (ACR) LCSR is approved by CMS for this purpose (10). The ACR administers the LCSR which helps clinicians monitor and demonstrate the quality of CT lung cancer screenings in their practice. ACR accreditation is recognized as the gold standard in medical imaging. Participants in the LCSR can collect data about lung cancer screening procedures, including patients’ demographic information, medical history and risk factors, procedure indications, and follow-up information. The latest data from LCSR for California is displayed in Table 5.

Table 5. Lung Cancer Screening Registry Statistics - Screening Exams performed in 2021

Aggregation Level	Year	# Facilities	# Screening Exams	Appropriateness of screening by USPSTF criteria	
				Rate	Num/Den
California	2021	133	17011	68.21%	(11604/17011)
LCSR	2021	3593	866954	86.73%	(752666/867822)

In 2021, California had 133 ACR accredited facilities participating, with 17, 011 screening exams reported for a rate of 68.21% of which were determined to be appropriate given the USPSTF criteria, compared to the LCSR national average for the same year of 86.73% (notably, the rate of appropriateness in California is significantly lower than the national average and merits further discovery). A successful lung cancer screening program must adhere to several required elements (8) as lung cancer screening is not solely an imaging test; it is a process that should take place within an organized program (9). When comparing LCSR data from year to year, caution must be used in interpreting progress given that the number of facilities reporting changes frequently. Limitations to the registry must be noted, including the fact that Kaiser Permanente, the health maintenance organization (HMO) that covers a large percentage of eligible patients in California, does not currently report to the

ACR LCSR. Further discovery is needed to identify what organizations are not reporting to the ACR, and if there is any way to facilitate the collection of that data.

National Health Interview Survey

There is an additional national data source, The National Health Interview Survey (NHIS), which provides some state level data on lung cancer screening through a Cancer Control Supplement (CCS); however, these data are not collected every year. The CCS focuses on issues pertaining to knowledge, attitudes, and practices of cancer-related health behaviors, screening, and risk assessment, and are covered on a rotating basis (11). The topics to be assessed as part of the annual CCS align with the rotating and annual topics in the NHIS. Lung cancer screening data was last collected in 2020 and is scheduled to be collected next in 2024. The NHIS shifted from in-person to telephone interviewing in March 2020 as a result of the pandemic and survey response rates declined, even after returning to an in-person interview method in July of that same year. For purposes of our report, we did not use any data from the 2020 survey year (12).

Behavioral Risk Factor Surveillance System

The BRFSS is a health-related telephone survey that collects state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. BRFSS is administered by the Centers for Disease Control and Prevention (CDC) and works with state health departments to collect self-reported data (13). The questionnaire has three parts which include a core component, consisting of the fixed core, rotating core, and emerging core; optional modules; and state-added questions. In 2017, for the first time, an optional module added questions on lung cancer screening (14). The rotating core is made up of two distinct sets of questions, each asked in alternating years by all states, addressing different topics. In the years that rotating core topics are not used, they are supported as optional modules. Lung cancer screening was added to the rotating core for the first time in 2022. The California BRFSS Program will collect data for lung cancer screening for the first time as part of the rotating core in 2022. In addition, this data will also be collected as part of the optional module in 2023, and any year that it is not part of the rotating core. There are six questions related to lung cancer screening included in the tobacco use section of the BRFSS questionnaire (15). With the addition of the annual lung cancer screening module to the California BRFSS Program, we will soon have another population-level estimate of lung cancer screening rates in the state.

Healthcare Effectiveness Data and Information Set (HEDIS)

The Healthcare Effectiveness Data and Informant Set (HEDIS) is a performance improvement tool used by United States managed care and health plans to measure the quality of care provided (16). Developed and maintained by the National Committee for Quality Assurance (NCQA), HEDIS data is collected and published to help calculate national performance statistics and benchmarks. The Centers for Medicare and Medicaid Services (CMS) requires managed care plans to submit Medicare HEDIS data. Currently, there is no HEDIS measure related to lung cancer screening, but through an award from the American Cancer Society and the American Lung Association, a measure is being developed for LCS as of November 2022. The new LCS HEDIS measure is expected to be released by the end of 2024 and will

help encourage health plans to take up efforts to improve lung cancer screening among eligible patients (17). Historically, after the release of a new HEDIS measure, other quality measures follow.

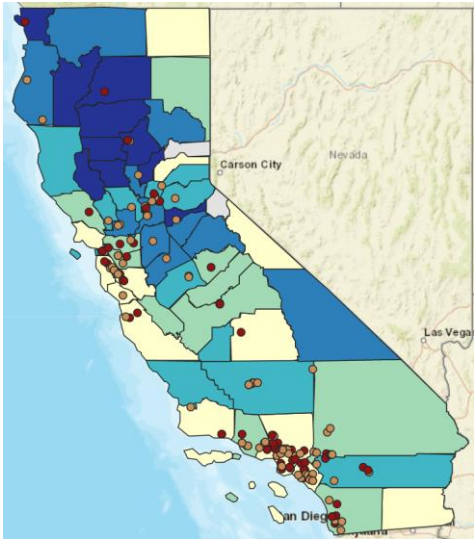
Lung Cancer Screening Locations: Geospatial Mapping

American Cancer Society data scientists collaborated with our environmental scan workgroup to create a geospatial map of California's ACR Lung Cancer Screening Registry (LCSR) locations with county-level lung cancer incidence and mortality rates. The data were pulled in July 2022 and show 177 lung cancer screening locations statewide. The ACR LCSR includes accredited Lung Cancer Screening Center sites, as well as non-accredited Lung Cancer Screening Registry participant sites that perform screening. The ACR LCSR is approved by the CMS to allow quality reporting by participants for Medicare CT lung cancer screening payment. The incidence and mortality data are provided by the National Program of Cancer Registries Cancer Surveillance System, Centers for Disease Control and Prevention, and by the National Cancer Institute's Surveillance, Epidemiology, and End Results Program (SEER Program).

The two maps create visualizations of the spatial distribution of ACR screening sites and patterns of the lung cancer incidence and mortality by county in the context of place-based factors. The workgroup intends to use the maps to be used as a foundation for future geospatial mapping efforts and as stated, show opportunities for further discovery and potential for informed decision-making. Several limitations exist that must be considered when interpreting the maps, the first is the assumption that lung cancer incidence and mortality rates in the county geographic areas are homogenous which is not a true reflection of the population as California is the most diverse state in the nation. We also acknowledge that the listing of lung cancer screening locations is not complete since not all locations submit screening data to the ACR. For example, Kaiser Permanente and the Department of Veteran Affairs currently do not submit data to any publicly available data. An additional limitation of the geospatial maps are counties that represent suppressed or no data. Suppressed and no data can be as a result of counties with fewer than 6 cases or an absence of data submission.

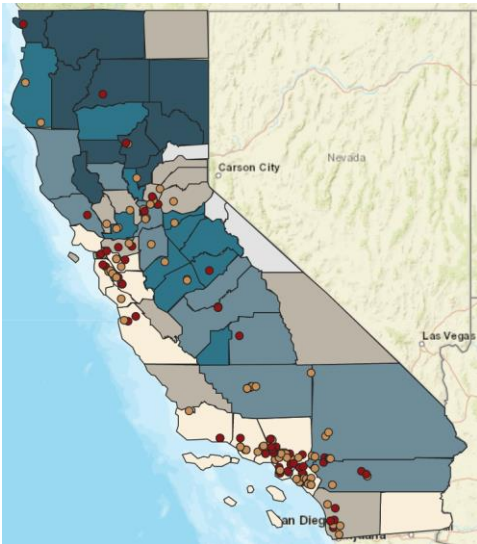
Interpretations from the maps show the need for further discovery in several regions, such as the cluster of counties in Northern California where incidence and mortality are particularly high compared to the state average. Additional analysis is needed to specifically examine the rate of late-stage diagnoses and to assess whether the excess lung cancer burden in these counties may be linked with a low availability of screening location. Future efforts to increase lung cancer screening requires further data analysis and collaboration with stakeholders.

ACR Lung Cancer Screening Centers with California Lung Cancer Incidence Rates (2014-2018)



- ACR Lung Cancer Screening Center (2022)
- ACR Designated Lung Cancer Screening Center [68]
- Lung Cancer Screening Center [105]
- Lung Cancer Incidence Rates (2014-2018)
- Suppressed or No Data
- 25 - 38.3
- 38.3 - 41.5
- 41.5 - 45.6
- 45.6 - 52.7
- 52.7 - 70.3

ACR Lung Cancer Screening Centers with California Lung Cancer Mortality Rates (2015-2019)



- ACR Lung Cancer Screening Center (2022)
- ACR Designated Lung Cancer Screening Center [68]
- Lung Cancer Screening Center [105]
- Lung Cancer Mortality Rates (2015-2019)
- Suppressed or No Data
- 18.3 - 25.1
- 25.1 - 27.6
- 27.6 - 31.9
- 31.9 - 36.5
- 36.5 - 52.3

National Literature Review: Barriers & Opportunities for Lung Cancer Screening

Patient Barriers

A literature review was conducted to identify barriers faced by patients at high-risk for lung cancer and their providers when accessing and initiating lung cancer screening (LCS). EBSCO host and Google Scholar databases were searched for studies and systematic reviews on this topic published between January 2017 and April 2022. Relevant sources included those published in English that included populations in the United States.

Current and former smokers at high risk of developing lung cancer are eligible for LCS screening that is covered without cost sharing by public and private insurers since 2015 (18). Eligible patients face significant barriers when initiating access to LCS. Several studies describe patients' lack of awareness of the existence of LCS or very limited knowledge about LCS (19) (18) (20) (21) (22). Another common patient barrier in the literature is patient concerns about the cost of screening and whether or not they would be eligible for insurance coverage (19) (18) (21) (22). Additionally, inaccurate patient perceptions about several aspects of LCS are indicated as possible reasons patients hesitate to pursue the procedures. Some of these views include the fear of receiving a cancer diagnosis (18) (22); the stigma and fear of being blamed for smoking (18) (21); feelings of unfair treatment or disrespect by the provider (19) (18); misunderstanding the criteria for eligibility of screening (20) (22); and misunderstanding the potential harms and benefits of participating in the screening process (19) (20) (21) (22). Frequently cited access barriers include physical access to screening such as the travel distance between home and screening site, lack of public transportation, the cost of the trip and parking, and concerns about taking time off of work for screening (19) (18). Language and cultural barriers between providers were of concern to some patients (19) (18). Lastly, some patients reported challenges with the mandatory process of having a shared decision-making visit with their provider (19) (20) (22).

Provider Barriers

Lung cancer screening is different from other cancer screenings, especially regarding eligibility and decision-making. Identifying the barriers that providers face is vital to understanding how this may impede the screening process or discourage providers from recommending screening for high-risk patients. Primary care providers are oftentimes unfamiliar with LCS policy, procedure, and guidelines (19) (18) (22); face challenges when determining eligibility among patients (19) (18) (21) (23) (24); and indicate difficulty during the referral process related to insurance coverage and cost (19) (23) (24). A major theme found in the literature was that providers find shared decision-making visits to be difficult, time constraining, and unmanageable (19) (18) (22) (23) (24). Additionally, several studies indicate that providers are skeptical of the results and false negatives from LCS (19) (18) (22) (23) (24) (25) and describe feeling a lack of support in the management of abnormal or false positive results (18) (22). Some providers admit they are unaware of the availability and importance of new screening tests (21) (22); describe their frustrations with electronic health records in assisting with the performance of

specific LCS-related tasks like taking history related to smoking and eligibility requirements (24) (25), and acknowledge that stigma against smokers may decrease their likelihood to recommend appropriate screening (24). Lastly, several studies suggest that a major barrier to providers recommending LCS for their patients is time constraints during patients' visits (19) (22) (23) (24).

Investigating the range of barriers that patients and providers experience regarding LCS both nationally and within California is an important first step necessary for mitigating these challenges.

Health-System Level Barriers

Health system barriers can also impede the processes and implementation of lung cancer screening. Lung cancer screening systemically is a more complex process compared to other screenings. These process-based complexities include the difficulties of identifying eligible patients by obtaining an accurate and complete smoking history in the electronic health record, EMR provider notifications of eligible patients (30), limited resources such as a lack of computed tomography scanners to support screening, competing demands for the limited resources such as personnel, and an uncertainty of the return on investment for lung cancer screening (31).

In terms of systemic implementation barriers, ordering LDCT for non-screening but diagnostic purposes has varied adherence to using standard reporting templates for results, there can be many eligible patients, limited capacity to capture required data in real time, and limited capacity to meet the demands of lung cancer screening in various clinical departments, including radiology. Another implementation barrier is ensuring that systems can manage the volume of nodules detected via screening. Pulmonary nodule evaluation requires systemic resources to ensure that adequate infrastructure and processes of care are in place to facilitate nodule evaluation and follow up care of the patients (31) (32).

Information technology is often another barrier to successful lung cancer screening programs. These technological needs include efficient and effective processes for patient scheduling within the organization's appointment system, electronic documentation of insurance requirements, ensuring screening results are reported to approved registries, and efficient processes for tracking screening completion, results, and follow up (31).

Societal & Policy Barriers

Some current policy barriers that prohibit effective lung cancer screening programs include the conflicting upper age limits in the current screening guidelines. Age limits in some guidelines range from 77 to 80 and can lead to barriers for health system leadership to develop accurate tools, educational materials, and standard order sets for lung cancer screening (31).

Other policy related barriers to lung cancer screening vary, but include, discrepancies related to insurance coverage and policies, lack of insurance coverage, costs, copays, communication policies among providers, EMR support and policies, lack of infrastructure, institutional, and capacity policy to support lung cancer screening programs (19) (29) (33).

Not noted in the literature, but a societal barrier shared amongst stakeholders is the out-of-pocket costs for patients who receive an abnormal LCS. The costs create a barrier to treatment that can contribute to the high rate of later stage diagnoses.

Key Informant Interviews

The workgroup was interested in collecting stakeholder input on existing barriers to lung cancer screening uptake, as well as opportunities to improve screening. Key informant interviews were conducted in the months of July through October of 2022 and facilitated by workgroup members using interview guides developed by members seeking to identify how informants engaged with lung cancer screening and their perceived barriers and opportunities to increase lung cancer screening rates in California. Informants were selected by workgroup members and identified based on their experience with known lung cancer screening projects, lung cancer screening programs and/or organizations working in the field of tobacco cessation, cancer screening or lung cancer research. In total, 20 key informant interviews were conducted virtually in one-on-one and small group settings.

About Our Key Informants

Informants represented a variety of backgrounds, including primary care providers, federally qualified health centers, pulmonologists, oncologists, researchers, thoracic surgeons, a radiologist, a lung cancer survivor, and individuals working in smoking cessation and community outreach.

Most of the key informants we interviewed were already actively working to increase lung cancer screening in their institution. A few of our key informants were not working on lung cancer screening, but had the potential to increase efforts (e.g., tobacco cessation staff at a health plan, and a tobacco cessation representative from the California Tobacco Control Program).

Key informants in two health systems had recently launched centralized lung cancer screening programs, both of which allowed for referrals from primary care doctors from within the health system and from affiliated providers outside of the system (including FQHCs). One of our key informants represented one of the first lung cancer screening programs in the country, which was established in 2013 even before there was reimbursement through Medicare.

Of the three federally qualified health centers (FQHCs) that we spoke to, two had recently been awarded grant funding to increase their LCS, which helped to jump-start their efforts. These FQHCs applied funds to improve their health information technology and to provide training to strengthen their workforce collaboration.

Our primary goal with conducting key informant interviews was to capture from a variety of stakeholders the challenges that they experience and gather input on greatest opportunities for action to drive lung cancer screening efforts in the future. We heard from key informants what they are currently doing to increase LCS and their plans for the future. The workgroup was additionally interested

in comparing the barriers reported by key informants to what was discovered in the literature review in order to identify challenges and/or barriers unique to California.

Key Informant Interview Themes: LCS Barriers & Opportunities

Below we offer a summary of the barriers and opportunities described by key informants, divided into patient, provider, and health system subsections, and include additional examples of the work currently being done within those areas. The barriers identified by the informants for patient, provider, and health system barriers were similar to those referenced in the literature review with some exceptions. It should be noted that patient barriers were identified mostly indirectly from clinicians and those working with individuals who are eligible for lung cancer screening, with the exception of information gained from one lung cancer survivor informant. The opportunities for improvement that the workgroup referenced in this section were primarily derived from comments made by our informants, but also include best-practices from the President's Cancer Panel Report, the National Lung Cancer Roundtable and other key stakeholders doing work in the field of lung cancer.

Patient-level barrier: Lack of Awareness

A lack of knowledge and/or misconceptions about patient eligibility for LCS was referenced by a majority of key informants as a patient barrier to screening. Our lung cancer survivor informant shared that they became aware of LCS and their possible eligibility through a LCS public awareness billboard and not from their primary care physician. Key informants overall emphasized the need for widespread public awareness campaigns similar to what we have seen for other types of cancer screening, and also the need for primary care education and resources to equip primary care practices to raise awareness in their patient populations. Another informant shared the need for public awareness campaigns spotlighting survivors, stating there are too few lung cancer survivors in campaigns unlike the "army of advocates" for other cancer types. As stated in the President's Cancer Panel Report, many people hold fatalistic beliefs about lung cancer, viewing it as untreatable. Communication campaigns should focus on increasing familiarity with lung cancer screening and its potential to reduce mortality.

Patient-level barrier: Fear

Patient fears of LDCT scans (radiation and what the scan involves) as well as fear of screening outcomes were commonly referenced. During one key informant interview, the informant noted hearing a patient eligible for lung cancer screening state "I've smoked for so long, I am afraid to find out what is in my lungs." One of our key informants found that the community health workers they were training to promote lung cancer screening had their own concerns and misconceptions about LDCT scans. The informant took the group of community health workers (CHWs) to see the machine, explain the procedure, and answer questions so that the CHWs would be able to speak confidently and dispel myths in the community. Utilizing CHWs and strengthening workforce collaboration is an important resource to help dispel myths and misperceptions, and focused training will equip CHWs to promote LCS in the community. Additionally, ensuring all members of the team receive education and training on patient fears and appropriate language to use to overcome those barriers will support cancer screening and strengthen uptake.

Patient-level barriers: Competing Priorities

The demands of everyday life and family cannot be ignored as a barrier for patients eligible for lung cancer screening. One of our informants shared that in addition to time-off from work and childcare needs that can sometimes make it challenging for patients to get to screening appointments, "screening is understandably not always the biggest priority for the underserved community." A single solution to this complex barrier may not be possible, but health systems have a responsibility to be aware of patient barriers to care and to provide whatever support is possible. Opportunities to consider are extended screening hours and/or flexible appointment options for patients with jobs or caregiver responsibilities and utilizing navigators to assist patients throughout the screening process, including providing referrals to other needed services along the way.

Patient-level barriers: Access

A common barrier to all cancer screenings is access, and LCS is not immune. Many key informants shared access to screening was a major patient-level barrier especially for those in rural areas where screening sites may be limited. Opportunities to address this barrier include offering transportation to and from screening, utilizing navigators to assist patients, and moving toward models of community-based lung cancer screening leveraging mobile LCS units and/or linkages between federally qualified health centers and screening sites.

Patient-level barriers: Stigma

Many key informants cited stigma around smoking as both a patient and provider level barrier to screening since it impedes effective patient-provider communication. One key informant who has worked in lung cancer advocacy and public awareness campaigns shared that they have seen patients demonstrate fear not only of a potential cancer diagnosis, but also of being judged by the provider for their smoking history. The key informant noted that the language providers used can sometimes hinder patients from revealing their smoking status out of embarrassment or fear of being judged. A passionate physician agreed that stigma is a huge thing we must combat, and that she has seen many patients experiencing guilt, as if they brought the possibility of lung cancer upon themselves by smoking. This physician shared that she tells patients experiencing guilt "there's no point in feeling guilty. If you quit today, it makes a difference, and you deserve to get screened." To address the influence stigma has on patients eligible for LCS, provider training is recommended to enhance empathy, improve communication, and eliminate stigmatizing language. Additionally, public awareness campaigns should tailor messages based on smoking status and use empathic messages to overcome stigma.

Patient/provider-level barriers: Insurance

Insurance coverage, or lack thereof, may hinder eligible patients from getting screening for lung cancer. Although the workgroup did not hear from key informants that out-of-pocket costs associated with an abnormal screening result was a barrier, we know it can be a challenge for patients. Our key informants focused on confusion around insurance coverage among both patients and providers, as well as challenges with getting the initial screening covered. One key informant noted difficulty for providers

getting authorization for LCS, stating “you have to be insured to be screened and for patients insured by Medi-Cal, there can be difficulty accessing authorization for screening which is not seen much in patients with HMOs.” Coding challenges were also shared. Provider and clinical education on LCS coding can help address this barrier and further work in the area of insurance coverage and fees is needed. The ACR has a quick reference one-page billing and finance resource, which can be found in our Resources section of this report.

Additionally, the current USPSTF recommends LCS for patients 50-80 years, but CMS coverage is only through 77, creating a policy gap in coverage for those 78-80. One key informant shared that although it does not come up often in her practice, for both patients and providers there is confusion on screening those between the ages of 78-80 yrs. This creates an opportunity for additional future advocacy and policy efforts to close the gap to ensure all patients recommended for LCS have insurance coverage.

Provider-level barriers: Confusing Guidelines & Calculating Smoking History

Healthcare providers play a critical role in getting eligible patients screened for lung cancer, but key informants shared that confusing guidelines and difficulty calculating and documenting smoking history and pack years can be barriers to their efforts. One key informant shared that the recommendations and requirements (such as the requirement of shared decision-making) for LCS screening differs greatly from other cancer types, adding to the confusion and noted that “the USPSTF and CMS guidelines do not align.”

Changes with lung cancer screening recommendations can make it challenging for providers to stay up-to-date on guidelines. Another key informant shared “capturing patient eligibility is at the crux of what we need to do” and identifying patients should not be so cumbersome. Education and training is necessary to ensure guidelines are disseminated, understood and adopted to assist providers in assessing cancer risks for patients and identifying those eligible.

A key informant from a federally qualified health system shared they received grant funding to initiate a lung cancer screening project and soon realized their first step was to develop health information technology solutions to help with documentation of smoking status and pack-year history to identify eligible patients. The FQHC customized their information system to create a 2-fold alert, alerting staff to collect pack year data and then an auto alert if patients are eligible for LCS. The technology not only supported screening efforts, but also helped reduce the time required from clinical staff to capture the information. Additionally, effective health information technology can be used to promote broader and more consistent guideline implementation and is a recommended way to reduce these barriers.

Provider-level barriers: Time Constraints/Prioritization Challenges

It was no surprise to hear from key informants that high demands/competing priorities and limited time for primary care providers is an important barrier to recommending lung cancer screening in primary care settings. One key informant noted that because of the very specific eligibility criteria, LCS is often only applicable to a minority of a provider's patient panel and thus doesn't rise to the top as a priority for them. Key informants also shared that providers juggle multiple priorities and are not always tuned

into the value of LCS, with one informant noting “the message of the value of screening is not out there like it is for cervical and/or breast cancer.”

Key informants offered several suggestions to improve this barrier and they emphasized the importance of involving other members of the healthcare team and automating processes so as not to further burden primary care clinicians. For example, one key informant described an effort to train medical assistants to ask about smoking history at every patient visit, and they use the entire medical team to identify and make LCS recommendations. An additional area of opportunity is to increase provider education on recommended guidelines and the value of lung cancer screening, encourage the implementation of health information technology to capture eligible patients and set up provider alerts, and strengthen the healthcare system workforce to ensure they have the skills to support gathering information to identify eligible patients and reinforce the importance of screening.

Provider and Health system-level barrier: Shared Decision-Making

CMS requires counseling before lung cancer screening to confirm eligibility, discuss benefits and harms of LCS and counsel for tobacco cessation (known as a shared decision-making visit). The shared decision-making requirement was noted by some key informants as a barrier due to the fact that “providers often do not know how to facilitate and document that discussion and it is a burden of screening that no other screening tests have to deal with.” While the clinicians that we spoke with mostly viewed the shared decision-making visit as an “extra step” that acted as a barrier, we know that this is controversial in the field and that many feel the shared decision-making visit offers a valuable connection with the patient and an opportunity to emphasize the importance of adherence to screening in subsequent years. A few key informants mentioned that the shared decision-making visit could be improved upon with adequate training, decision guides for use with patients, and more guidance from CMS on who can conduct the visit. One of our key informants from a large health system reported that patients in that system are required to watch a somewhat lengthy (20 minute) informational video before being scheduled for the shared decision-making visit. They noted that this unnecessary requirement could be eliminated/streamlined so as not to create additional barriers to screening.

Health system-level barriers: Lack of Integration with Tobacco Cessation

Healthcare providers, health systems and communities must all work together to make it as easy as possible for eligible patients to be screened for lung cancer, but key informants shared there is often a lack of partnership among lung cancer stakeholders. Key informants noted that one way to improve partnership is to better integrate lung cancer screening education and referral into the workflows for smoking cessation. Just as patients with a smoking history should be referred to smoking cessation programs, equally important is sharing LCS education with patients with a known smoking history to capture those who may be eligible for screening. One key informant shared that their hospital system overcame this barrier by linking their LCS program with their tobacco cessation program and customized their cessation curriculum to include information on LCS.

There are additional opportunities for health systems to better integrate LCS with their smoking cessation efforts. Health educators helping patients with tobacco cessation (including health educators

working for health insurers) can better educate patients about LCS and connect eligible patients to screening. Additionally, there is an opportunity to partner with the state quit line on statewide LCS promotion efforts.

Health-System Level barrier: Lack of Quality Measure

An additional barrier that arose from our key informant interviews is that lung cancer screening is a difficult thing for a health system to prioritize in the absence of a required quality measure. A HEDIS (Healthcare Effectiveness Data and Information Set) measure for lung cancer screening does not currently exist, but is now under development, which has historically led to the development of other quality measures (CMS, HRSA). As noted previously, the inclusion of LCS as a HEDIS measure will help to increase health system and provider prioritization and increase screening rates.

Models of Lung Cancer Screening and Interventions Reported by Key Informants

Because lung cancer screening is relatively new and unique from other cancer screenings, the health system representatives that we spoke with understandably reported challenges building their lung cancer screening efforts. One leader of a health system's lung cancer screening program described that the complexity of lung cancer screening extends to who "owns" it: "GI generally owns colonoscopies. Radiology generally owns mammograms. For lung cancer screening, who owns it is different depending on how it's set up- it could be the primary care provider, the radiology facility, or the lung cancer screening program, for example."

We spoke with two large healthcare systems that had recently launched lung cancer screening programs using a hybrid model. The hybrid model included establishing a centralized program while also allowing a pathway for primary care physicians to do shared decision-making visits and order scans themselves, and even allowing patients to self-refer at times. Another health system that we spoke with is also pursuing a mobile lung cancer screening program. There are, however, varying perspectives about mobile lung cancer screening, with one key informant noting: "in my mind, it's more powerful to have a centralized program offering transportation assistance."

The federally qualified health centers we spoke with described resource-intensive work to establish referral pathways, including determining which imaging centers to refer to and how to get the results back. One individual from an FQHC explained that this is a very new area of work, and they were needing to help providers change existing patterns: "All of it is just new. Before it was happening where the PA had ordered a regular CT, not knowing it had to be low dose, and would refer to a regular radiology center, not an ACR accredited one. So they had done the screening but sort of did it wrong."

Given the newness of lung cancer screening, there are few tested interventions for priority populations. Fortunately, several of the key informants that we spoke with were getting creative with reaching priority groups. One key informant reported successfully partnering with federally qualified health centers in high priority areas, sharing "We screened 500 patients, mostly African American, which are typically considered hard to reach. But they aren't really that hard to reach if you work with the

institutions that serve them.” Another researcher reported that their institution is participating in a multi-site project combining lung cancer screening with mammography in a point-of-care intervention where patients in a waiting room (waiting for a mammogram) can self-refer to LCS. The researcher acknowledged some controversy in engaging with patients directly in this way as opposed to looping in the primary care provider, stating “I think both approaches [looping in PCP versus contacting or engaging with the patient directly] are good. Some PCPs like it, and others don’t. But we need to figure out alternate points of entry. It’s not one size fits all.” One thoracic surgeon noted that while “primary care providers are the gateway to screening, part of my work has been to find other niches.” Specifically, this surgeon described an effort targeting patients in an emergency room setting to assess awareness of lung cancer screening and refer eligible patients. It is likely that multi-channel approaches will be the most successful, seeking to reach patients where they are: in primary care settings, other parts of the healthcare system, and in the community.

But Why are Rates Particularly Low in California?

Many key informants were surprised at California’s low rate of lung cancer screening compared to the national average. At first glance, it was assumed by workgroup members that the low rates may be due largely to under-reporting of lung cancer screenings as there is a lack of systematic reporting to the ACR LCSR. Two large health systems that cover many Californians, Kaiser Permanente and the United States Department of Veterans Affairs do not currently report to the ACR. While we feel that this merits further investigation, key informants did not feel that under-reporting was the major factor driving California’s low estimated LCS rates. Instead, several key informants raised the possibility that California’s low smoking rates, image as a healthy state, and increased stigma around tobacco use in California may be playing a key role.

One informant stated "In California our current smoking rates are lower than they've ever been, so there's this idea that people don't smoke much, and even among smokers, there's this really specific eligibility, and then even among those eligible, only a small subset will be diagnosed with lung cancer. So I feel like it just hasn't permeated our culture in the way that breast and colorectal cancer screening have." Addressing this barrier can be done through a stigma-free public awareness and education campaign focused on making LCS familiar and can help reduce lung cancer related mortality.

Several respondents suggested that the low smoking rate/increased stigma around smoking in California might heighten a patient’s reluctance to reveal their smoking status. Additionally, the low overall smoking rates in CA could contribute to providers’ underestimating the smoking history of their patients. One respondent summed it up as follows: "We have the lowest tobacco use rates in the country: California is viewed as such a healthy state. This might be playing out in a few ways. Patients may be hesitant to disclose smoking history to a provider, and just in general we don't want to talk about smoking. There's a lot of stigma. And then there's this idea among providers that it doesn't apply to many of their patients. I think there's a lot of stigma around the topic in CA. " It is recommended that more attention be given to the topic of stigma through provider education to incorporate empathetic language.

Discussion

Recommendations and opportunities for action and implementation no doubt require a collaborative effort for stakeholders across the lung cancer continuum, including healthcare providers, health systems, community health workers, community organizations, patient advocates, and lung cancer survivors. The following summarized recommendations represent a compilation of ideas gleaned from our key informant interviews, literature review, the efforts of the National Lung Cancer Roundtable, and recommendations from the President’s Cancer Panel Report. Our call to action is for stakeholders to use the recommendations provided and to partner on efforts to increase lung cancer screening and reduce lung cancer mortality throughout the state.

Healthcare Providers

- Communication tactics that reduce stigma
- Provider education on lung cancer screening guidelines and value of lung cancer screening
- Utilize patient decision aids to support discussions/save time

Healthcare providers and healthcare teams can support strategies to overcome the barriers of fear and stigma experienced by patients. Increasing communication tactics for healthcare providers is recommended to reduce stigma, including empathetic language that can be culturally tailored. The provider education should also incorporate lung cancer screening guidelines and the value of lung cancer screening to address relevant barriers presented in the national literature review and barriers shared by key informants. The utilization of patient decision aids to support discussions during shared decision-making conversations can help save time and can support patient populations with low health literacy.

Community Organizations

- Community education on lung cancer screening
- Increase public awareness- feature survivor voices
- Support efforts to counter stigma
- Partnerships with health systems

Community organizations can spearhead or disseminate public awareness campaigns that include lung cancer survivors and highlight survivor voices. As noted in the President’s Cancer Plan Report, many people hold fatalistic beliefs about lung cancer, viewing the disease as untreatable. However, targeted public awareness campaigns have the ability to increase familiarity with lung cancer screening and its potential to save lives. Public awareness campaigns can also help to reduce stigma surrounding smoking and lung cancer, which can hinder eligible individuals from pursuing screening.

Healthcare Systems

- Analyze system data: documented smoking history and current LCS rates
- Assess LCS workflows and Integrate LCS with smoking cessation workflows
- Strengthen workforce collaboration
- Utilize community health workers
- Empower healthcare team through training on USPSTF guidelines and effective communication strategies
- Leverage IT to better capture eligibility & Utilize provider best practice alerts

The prioritization of lung cancer screening at the health-system level has the potential to greatly propel screening rates. We encourage health systems to examine how lung cancer screening is being delivered to patients, and to analyze available data on lung cancer screening (including the smoking history data needed to determine eligibility). Systems seeking to establish or expand lung cancer screening programs often face challenges obtaining necessary resources. [LungPLAN](#) is a tool created by the National Lung Cancer Roundtable which helps provide a business framework and financial justification to secure resources for screening and nodule management programs.

In order to better reach and engage eligible individuals, health systems can integrate lung cancer screening outreach with smoking cessation workflows. Additionally, partnering with community organizations serving those most affected by lung cancer and leveraging community health workers as trusted individuals can help patients overcome fear and ultimately strengthen trust in medical institutions.

Health systems can also help equip and empower healthcare teams through trainings on screening guidelines and de-stigmatizing communication techniques. Additionally, leveraging health information technology to support clinicians is imperative. Moving toward more efficient and complete capture of patient eligibility information allows for the utilization of provider best practice alerts.

Health systems also have a role to play in increasing public awareness. We encourage partnership with community, advocacy, and survivor organizations to raise awareness about lung cancer screening, spotlight survivor voices, and counter stigma around tobacco use.

Statewide Partnership Opportunities

- Continued collaboration and screening uptake efforts
- Provider/healthcare best practice sharing
- Data analysis for lung cancer screening
- California public awareness campaign

In addition to strategies within individual health systems and organizations, there are many opportunities for stakeholders to work together on cross-cutting statewide efforts to increase lung cancer screening. Opportunities include sharing healthcare and provider best practices, statewide public awareness campaigns, and a focus on collecting and analyzing accurate screening data. With the ability to soon utilize BRFSS data, we are on our way to gaining a clearer picture of our state LCS rates, but there is still much that needs to be done. As previously stated, not all lung cancer screening sites share data with the ACR making data collection and analysis difficult. Supporting efforts to collect more complete and accurate data can help create a foundation to build on and measure impact of work being done.

Conclusion

This report's aim was to gather, organize, and analyze information relating to lung cancer and lung cancer screening in California in order to inspire stakeholder action and inform future strategies for ACS and CDOC. At the time of this writing, the ACS and CDOC are in the early stages of discussions about establishing a state roundtable and/or identifying feasible actions for priorities outlined in this report. Workgroup members have also connected with others in the state, such as the University of California Lung Cancer Consortium to discuss collaborating on future efforts.

The recommendations contained in this report are by no means an exhaustive list, but rather a starting place for discussion. We look forward to increased collaboration among California stakeholders to improve lung cancer screening uptake and reduce the burden of lung cancer in the state.

Acknowledgements

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Resources

- Lung Cancer Screening Patient Decision Aids
 - [American Cancer Society Lung Cancer Decision Aid](#)
 - [American Cancer Society Lung Cancer Decision Aid \(Spanish\)](#)
 - [University of Chicago Medicine Comprehensive Cancer Center](#)
 - [Siteman Cancer Center](#)
 - [University of Michigan: Should I Screen](#)
 - [University of Pittsburgh Medicine](#)
 - [UpToDate Screening for Lung Cancer](#)
- [LungPlan, Projecting Lung Assessment Needs](#)
- [Get Screened California: Lung Cancer Resources](#)
 - [American Cancer Society Patient Lung Cancer Facts Sheet](#)
 - [American Cancer Society Provider Lung Cancer Facts Sheets](#)
 - [American Cancer Society Screening Flyer](#)
 - [American Cancer Society Lung Cancer Decision Aid Clinician](#)
- [ACR Lung Cancer Screening Economics & Billing Quick Reference](#)
- [American Lung Association 2022 State of Lung Cancer Report](#)
- [National Lung Cancer Roundtable: Resources](#)
 - Patient Resources
 - LCS Guidelines/Recommendations
 - Shared Decision-Making
 - Implementing a LCS Program
 - Education and Training for the Healthcare Team
- [NLCRT Atlas & Dashboard](#) (interactive maps)
- [President's Cancer Panel Report \(2022\)](#)

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