



A NIOSH Center of Excellence for *Total Worker Health*[®]

ANNUAL REPORT 2022 – 2023

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The California Labor Laboratory (U19OH012293)

A Collaboration of UCSF, UC Berkeley, Harvard University,
and California State Department of Public Health

Executive Summary

The California Labor Laboratory *Total Worker Health*® Center of Excellence (Lab) has been in existence since September 2021. In this annual report, we document how we have pursued our overall mission, the specific aims of the Evaluation and Planning and Outreach Cores, funded Research Projects and Pilot Grants Program, and engaged stakeholders beyond those with a formal role within the Lab to further the reach of the Lab.

As of October 2022 when we filed the prior Annual Report, we had a fully functioning infrastructure to support the success of the Center in all matters related to administration and had established five separate advisory groups to guide the Lab's work: the Internal Advisory Committee, the External Advisory Committee, the Community Engagement Board, the Policy Forum, and the Research Services Unit. The Lab has developed an interactive website allowing us to communicate with the public about our work and to receive input from them. Our communications program has resulted in the active engagement of over 500 members of the community who stay informed about our activities and are able to register for our programming.

The research projects are designed to provide an extensive look at the extent and impact of non-traditional employment throughout the California economy; an intensive look at the largest sector using such employment, the service sector; and a case study of one industry dominated by immigrants as both entrepreneurs and workers, artificial stone fabrication. All of the funded projects are on target to meet their timelines of accomplishment. The effort of the Lab's researchers to foment a new generation of investigators focused on emergent working conditions, the Pilot Grants Program, has been launched through the release of a RFA to which 23 applicants responded by submitting an application for funding. As of September 2023, eight investigators were funded to perform research consistent with the California Labor Laboratory's mission.

The Outreach Core has had a number of significant accomplishments, including the completion of a large scale scoping review of accumulated knowledge on how working conditions in traditional and emergent employment affect the health and well-being of workers; a comprehensive catalog of what other TWH Certificate programs have done as a prelude to defining our unique niche related to non-traditional employment; the completion of a comprehensive case study of how traditional practices for planning new workplaces can bring human-centered design as a primary goal to foster healthy work and workers; and the development of high impact public-facing education programs through a monthly webinar and the second annual conference.

As we enter the third year of the Lab's existence, we can report that the Outreach efforts are getting the Lab into the public eye, including that of legislators in DC and Sacramento. At the same time, our research projects have made enough progress in data collection and analysis to allow for presentation at professional meetings and legislative hearings as well manuscript preparation.

The CA Labor Lab continues to prioritize community and stakeholder engagement in all of its activities. To that end, a Community Engagement Board, made up of representatives of worker organizations representing low wage workers impacted by the changing nature of work, has been formed and has met twice to provide input into ongoing work. We have also completed a Research to Practice toolkit which will support research teams in ensuring that stakeholders impacted by research are engaged in the research process as early as possible.

We have organized this report by four major overlapping functions: *the Evaluation and Planning Core*, which maintains the infrastructure to ensure the Lab's success; *the Research Program*, which describes the prevalence and impacts of emergent and traditional forms of employment; *the Outreach Core*, which sets the stage for mitigating these adverse impacts through a comprehensive set of activities; and the *Pilot Grants Program* and *Certificate Program in Total Worker Health*®, both of which seek to increase interest in the impact of emergent working conditions, focused particularly on protecting the health of workers in precarious work arrangements.

In the table below, we highlight the outputs of the Lab in its first two years of existence.

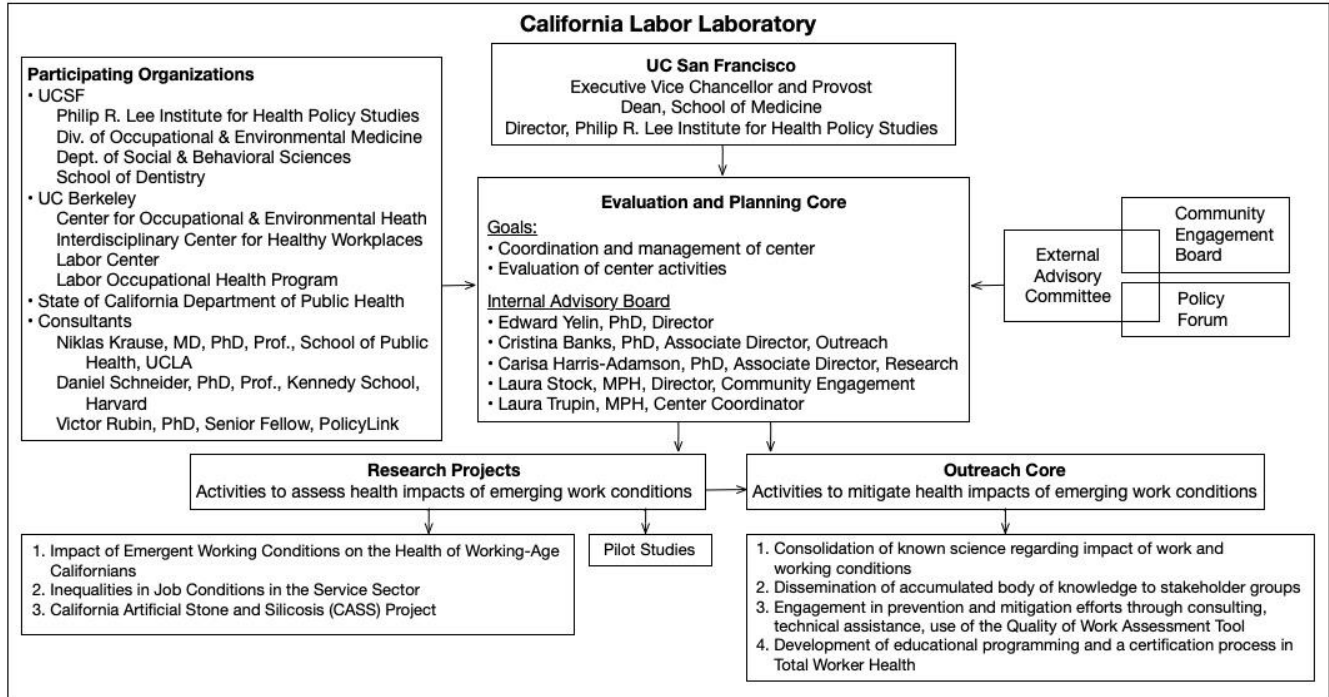
CA Labor Lab Outputs, September 2021 – October 2023
<p>Evaluation and Planning Core</p> <ul style="list-style-type: none"> ● Established internal and external oversight committees with regular schedule of meetings ● Constituted Community Engagement Board and held two annual meetings with membership ● Created Policy Forum and held policy sessions at both of the Lab’s annual conferences ● Created infrastructure for monitoring progress ● Developed website and maintained regular communication with >500 stakeholders ● Launched public-facing education program of webinars and annual conferences
<p>Outreach Core</p> <ul style="list-style-type: none"> ● Completed Scoping Review of impact of healthy work in traditional and emergent working conditions ● Began distributing the Scoping Review Report for comment from other COEs and writing manuscript ● Made presentations to multiple academic and professional conferences regarding Total Worker Health ● Developed and completed initial case study ● Completed R2P toolkit for guiding community engagement ● Developed a proposal for a national educational Total Worker Health professional development program and completed review of existing programs and courses on UCSF and UCB campuses
<p>Pilot Study Program</p> <ul style="list-style-type: none"> ● Finalized RFP (request for proposals), for release in November 2022 ● Developed plan for broad dissemination of RFP to academic and non-profit institutions ● Created a peer review panel and evaluative criteria for proposals received ● Funded eight of 23 proposals received.
<p>Project 1: Emergent Working Conditions</p> <ul style="list-style-type: none"> ● Held summit meeting on measurement of alternative employment ● Developed set of potential measures of alternative employment arrangements and conducted key informant interviews and cognitive interviews to determine appropriateness of potential measures. ● Conducted survey of 4,000 working age Californians, completed in May 2023 ● Presented results in several forums in October and November 2023 ● Disseminated data to a Pilot Study grantee and graduate student from UC, Berkeley ● Planned public use version of the data for release in early 2024
<p>Project 2: Inequality in Service Sector</p> <ul style="list-style-type: none"> ● Completed three new manuscripts related to gender and race/ethnic inequalities in working conditions. One was published in <i>Health Affairs</i> and two are under review at peer-review journals. ● Presented research on inequalities in working conditions at several conferences and webinars. ● Completed state and county policy database, which documents efforts made by states and local governments to expand or curtail protections for workers
<p>Project 3: CA Artificial Stone & Silicosis</p> <ul style="list-style-type: none"> ● Completed assessment of educational resources for countertop fabrication workers and employers. ● Developed employer and worker questionnaires to assess silicosis knowledge and control methods used. ● Completed phone and in-person interviews with countertop fabrication employers and conducted fabrication shop site visits ● Developed new educational materials for employers: ‘Silicosis Air Monitoring Employer Guide’ and ‘Respirable Crystalline Silica Standard Overview.’ ● Developed outline and draft content for Silicosis Continuing Medical Education (CME) Course. ● Obtained approval of IRB application for medical testing study protocol ● Established electronic case reporting of silicosis

Overall Center

The context for the California Labor Laboratory is the emergence of a comprehensive strategy to shift responsibility for workers' welfare from the employer to the workers themselves. This is done through the use of alternative forms of employment such as task- (aka gig), project-, or subcontracting-based arrangements; growth of contingent work; and erosion of traditional working conditions. As a corollary, many protections built up in the 20th Century, including workers' compensation, OSHA regulations, employer contributions to Social Security, retirement plans, and health insurance are unavailable to those hired in alternative ways.

The mission of the CA Labor Lab is to extend the pursuit of health and safety for workers in traditional employment to those in a wide range of alternative arrangements in partnerships with affected communities. The specific aims of the Lab flow from this mission and are to describe the health impacts of traditional and alternative work arrangements through research and to prevent or mitigate these effects through outreach: education, guidelines, interventions, and policy. The hypothesis underlying the work of the Lab is that these changes have an adverse impact on the health of the working age population.

The Lab is housed in the Philip R Lee Institute for Health Policy Studies at UCSF (IHPS). IHPS is the academic home of the Lab's PI, Dr. Edward Yelin and the Center Coordinator, Laura Trupin. IHPS is also responsible for the fiscal management of the Lab. The California Labor Laboratory includes participants from other academic units at UCSF (Department of Medicine Divisions of Occupational and Environmental Medicine and Rheumatology, Department of Social and Behavioral Sciences, and School of Dentistry) as well as several at UC, Berkeley (Center for Occupational and Environmental Health, Interdisciplinary Center for Healthy Workplaces, Labor Center, and Labor Occupational Health Program). Additional Center investigators are from the California State Department of Public Health Occupational Health Branch, the Kennedy School at Harvard University, and UCLA. In order to improve coordination between UCSF and UC Berkeley, IHPS has provided an academic appointment for the Director of Outreach, Cristina Banks, who also retains her UC Berkeley appointment. This figure portrays the structure and key components of the Labor Lab.



Note: Throughout this report, we use *italicized text* to indicate the statements of mission and aims as described in our proposal and regular font to describe what we have done in pursuit of these mission and aims.

Evaluation and Planning Core

Oversight for the California Labor Laboratory is the responsibility for the Lab's Evaluation and Planning Core (EPC); the EPC also serves as the musculoskeletal and circulatory systems for the Lab, providing an infrastructure to hold the pieces of the Lab together and to foster communication within the Lab to create a unified whole.

The overarching aim of the Evaluation and Planning Core (EPC) is to ensure that CALL achieves its mission of understanding the health impacts of emergent work conditions through its research and fosters change in the use of the forms of employment that adversely affect the health of workers through its outreach. Specific aims of the EPC are to: 1) create and sustain a communication and coordination structure for the Center that will create the means for each research and outreach activity to succeed and provide a range of services that foster that success; 2) act as an incubator of change agents in research through the development of a pilot studies program and in outreach activities through the development of an interdisciplinary training program in mitigation of the adverse impacts of emergent working conditions so that the Center's mission can be furthered after its tenure is complete; and 3) to evaluate the Center's success in conducting the planned activities during its tenure and incubation of change agents beyond its tenure.

To monitor and, if necessary, ameliorate the activities of the Lab, the EPC has constituted separate Internal and External Advisory Committees, a Community Engagement Board, a Policy Forum, and a Research Services Unit.

The Internal Advisory Committee (IAC), consisting of the Lab PI, Dr. Yelin, the Associate Director for Outreach, Dr. Banks, the Associate Director for Research, Dr. Harris Adamson, Laura Stock, Director for Community Engagement, and the Lab's Coordinator, Laura Trupin. The IAC met weekly for the first four months of the Lab, and has met bi-weekly since to set strategy for the next period of the Lab's activities, monitor progress in each of the activities, and develop ways of maintaining ties among the Lab investigators. The IAC also oversaw the development and improvement of the communication tools within the Center, including a shared calendar, website, template for reports and data briefs, and logos. The IAC also is responsible for ensuring timely completion of progress reports to NIOSH and the university as well as this annual report. The Lab's Educational Coordinator, Michelle Meyer, also attends these meetings. She plays a key role in facilitating all of our outward-facing programs and our external communications. Ima Varghese Mac, a Labor Lab staff member, attends all IAC meetings to ensure accurate meeting minutes and timely distribution of agendas. The IAC has also taken the lead in strategic initiatives such as the choice of themes for the annual conference and the direction for the Lab's interactions with the policy community and the public.

The External Advisory Committee (EAC). The EAC is designed to provide input into the Lab's Cores and Projects as they unfold as well as to provide strategic direction to the Lab. Examples of the involvement of individual members of EAC in providing on-going input abound. For example, Mr. Garen Corbett provided lists of legislators in Sacramento to target for health initiatives of the Policy Forum, and also reviewed plans for the Policy Session at the Lab's First Annual Conference. Dr. Michael Reich attended Project 1's summit on measurement issues in alternative employment, has provided on-going input into the design of new measures, and has put us in touch with others doing work in this area. Dr. Ninez Ponce has been actively involved in strategies to develop the sampling frame for Project 1's California Work and Health Survey. As PI of the California Health Interview Survey (CHIS), Dr. Ponce connected us to the CHIS statistics team who helped us develop the sampling weights for the California Work and Health Survey. Beth Ross, JD, spoke at our annual conference on legislative and regulatory initiatives in alternative employment. For the aim of having the EAC provide oversight for strategic planning in the Lab, the entire EAC and the Lab's faculty and staff met on January 27, 2023. Nearly all members of the EAC (shown below) attended that meeting. EAC members shared their perspectives on the overall goals of the CA Labor Lab and what they individually brought to the Lab's work. There were in-depth discussions of the development of the Lab's educational programming, research program, and community engagement. The EAC will meet again in January 2024.

An important outgrowth of the EAC meeting is a set of strategies to communicate about the Lab’s activities across a diverse set of audiences, for example labor as represented by Mitch Steiger and Jora Trang, business as represented by Jeffrey Pfeffer and Gervais Tompkins, academics as represented by Michael Reich and Steven Shortell, and policy, as represented by Garen Corbett and Beth Ross.

Members of the External Advisory Committee		
Member	Affiliation	Role in Ca Labor Lab
Garen Corbett	Dir, Ca Health Benefits Rev Program, UC, Berkeley	State Policy, Center Admin.
Jeffrey Pfeffer, PhD	Prof, School of Business, Stanford University	Organizational behavior and health effects of work organ.
Ninez Ponce, PhD	Dir, Ca Health Interview Survey, UCLA	Expertise in surveying diverse populations
Michael Reich, PhD	Prof of Econ, UC, Berkeley	Low wage and minority labor
Beth Ross, JD	Labor attorney	Legal strategy for alternative employment
Steven Shortell, PhD	Dean Emeritus, School of Public Health, UC, Berkeley	Work organization and Center Admin.
Mitch Steiger	Legislative Advocate, Ca Labor Federation	Employment policy and legislative advocacy
Gervais Tompkins	Principal, Plus Gervais Architects	Design of healthy workplaces
Jora Trang	Chief of Staff and Equity, Worksafe	Community engagement and low wage employment

Community Engagement Board (CEB). The mission statement of the California Labor Laboratory puts community engagement at the center of Lab activities: everything we do we do in concert with our community partners to ensure that what we do is relevant to their needs. In the application for funding, we explicitly said that we would constitute the CEB as the work of the Lab began to unfold to make sure the work we do is informed by the needs of key stakeholders and that results of our research and other activities reach the impacted community. The initial meeting of the CEB took place via video conference on October 7, 2022, with nearly all CEB members (listed below) in attendance. The attendees engaged in a thoughtful discussion of the ways in which the Labor Lab’s work in research, outreach, and policy could support their constituents’ needs and agendas. They also provided specific input on how best to engage with impacted communities. The Board met again on October 23, 2023 to further discuss these important issues. There is intentional overlap between the Community Engagement Board and External Advisory Committee, with Mitch Steiger from the California Labor Federation and Jora Trang from Worksafe serving on both committees so that the deliberations of the Community Engagement Board are represented in the oversight functions of the External Advisory Committee. An immediate outcome of the 2023 meeting was a plan to use the California Work and Health Survey data to provide estimates of the various forms of employment with which members of the CEB have an interest, for example the characteristics of rideshare drivers.

Members of the Community Engagement Board	
Member	Affiliation
Jane Thomason	California Nursing Association
Rocelyn De Leon-Minch, alternate	National Nurses United
Kimberly Alvarenga	California Domestic Workers Coalition
Sara Miles	United Food and Commercial Workers (UFCW)
Ben Master	Service Employees International Union (SEIU) Fight for 15
Doug Bloch	Teamsters
Nicole Moore	Rideshare Workers United
Tim Shadix	Warehouse Workers Resource Center
Mitch Steiger	California Labor Federation

Ruth Silver-Taube	Legal Aid at Work
Kevin Riley	Labor Occupational Safety and Health Program (LOSH), UCLA
Jora Trang	Worksafe
Danny Spitzberg	Tech Workers Coalition
Alice Berliner	UC Merced Community and Labor Center

Policy Forum. The Policy Forum was designed to create interactions between the faculty and senior staff of the California Labor Laboratory and policymakers in the Legislative and Executive branches of the State and Federal government. The activities of the Forum are a key component of the Lab’s Outreach Core and are more fully described in that section of the Annual Report, below. Here we state that the Lab spent its first year establishing connections with governmental affairs officers of the two keystone campuses and we have identified key legislators and executive branch officials in both State and Federal government and begun to have a meaningful dialog with several, most prominently in the closing session devoted to policy in our first annual conference on precarity in employment and in the opening session of the second annual conference on surveillance and monitoring in employment in which Senator Alex Padilla addressed the meeting and in its closing session. Because the projects all have results, the California Labor Laboratory is developing a plan to engage policymakers in Washington, DC and Sacramento in the implications of the Lab’s research. We are currently working with the University of California Washington DC Office to plan to brief legislators and staff on the findings of the Lab’s projects in February 2024.

Research Services Unit (RSU). The focus of the External Advisory Committee and Community Engagement Boards are to make sure that the projects and Cores are oriented to the important issues arising from the emergence of alternative ways in which people are hired to work. The RSU is designed to provide on-going support to the Lab’s funded projects and to aid in the design and evaluation of proposed expansions of the Lab’s research endeavors through additional grants to existing investigators and the Lab’s Pilot Studies Program. The RSU includes expertise on the substantive orientation of the Lab to emergent working conditions as well as on the methodologies used in the Lab’s research projects. The RSU members attend the Lab’s monthly research meetings, providing input into the Lab’s projects at every step of completion; they also consult with Lab investigators one-on-one when needs arise. The RSU membership is listed in the table, below.

There are numerous examples of the use of the RSU members in the design of Lab research projects. For example, Dr. Blanc, an occupational health expert, reviewed the measures of job demands and workplace exposures for Project 1; Dr. Chang assisted the Project 1 investigators with power calculations and with developing an imputation model to address an issue with one of the survey questions. Dr. Harknett shared measures about shiftwork from her prior work in that area to the Lab’s other projects, Mr. Jacobs consulted with experts from the Institute for Research on Labor and Employment, the parent organization of the Labor Center, about state-of-the-art measurement of alternative employment arrangements, while Dr. Katz weighed in on the psychometric properties of the data collection instruments chosen by Lab investigators. Many of the members of the RSU were involved in reviewing pilot project applications. Drs. Harris and Yelin have provided instrumental support to the pilot project grantees as their research gets underway.

The RSU members played a key role in reviewing applications for Pilot Studies grants in the second year of the Lab. In addition, their role in the currently funded projects has shifted from design issues, for example the trade-off between comprehensive measurement and respondent burden, to appropriate techniques for data analysis.

Membership of the Evaluation and Planning Core’s Research Services Unit	
Member	Expertise
Laura Trupin, MPH (Chair)	Epidemiologic methods, research design, data management
Jing Cheng, PhD	Biostatistics, power estimation
Kristen Harknett, PhD	Quantitative and qualitative research, demography, labor market measures
Carisa Harris Adamson, PhD	Ergonomics, work organization
Ken Jacobs, AB	Labor market trends and measurement
Patricia Katz, PhD	Psychometrics, survey research methods, behavioral health measures
Edward Yelin, PhD	Survey research, systematic reviews, research techniques on vulnerable groups

Increasing Visibility of EPC Leadership. Several members of the EPC leadership team have received accolades and taken on additional responsibilities related to the mission of the California Labor Laboratory:

The Lab PI, **Dr. Yelin**, was named the Edward A Dickson Emeritus Professor at UCSF in recognition of his leadership role related to work and health over his career. As part of this professorship, Dr. Yelin was provided support to augment the UCSF educational efforts related to the intersection of work and health. Dr. Yelin served on the Scientific Planning Panel for the 3rd International Symposium on Total Worker Health. Lastly, Dr. Yelin serve as Chair of the Directors of the TWH Centers of Excellence in 2023.

The Lab's Associate Director for Outreach and Director of the Outreach Core, **Dr. Banks**, was appointed a full research professor at UCSF's Institute for Health Policy Studies after a national search. This new position will help improve coordination across the two principal campuses of the Lab since Dr. Banks is retaining her appointment at UC, Berkeley. Dr. Banks played a key role in planning the International Symposium on TWH in Bethesda, serving on the Symposium Planning Committee and made two presentations at that meeting. Dr. Banks serves as Co-Chair of the Directors of the TWH Centers of Excellence in 2023. Finally, Dr. Banks has been named the president-elect of the Society for Total Worker Health, the new organization of professionals dedicated to the principles of the TWH movement.

The Lab's Associate Director for Research, **Dr. Harris Adamson**, was appointed the Director of the Northern California Center for Occupational and Environmental Health, the three-campus consortium of UCSF, UC, Berkley, and UC, Davis. Through her roles, she will play an instrumental role in engaging trainees and researchers from these institutions who are interested in collaborating on TWH Initiatives. By encouraging collaboration from researchers across campuses with varied funding sources, the work of the CA Labor Lab will expand beyond the foundational support from NIOSH. For example, as the Principal Investigator of a state funded project assessing the workload of California Janitors, Dr. Harris Adamson will be investigating the impact of precarious work on physical and mental health outcomes in this population.

Outreach Core

Cristina Banks, PhD, Director
Laura Stock, MPH, Director of Community Engagement
Victor Rubin, PhD, Director of Policy
Monique Hosein, DrPH, Community Engagement Coordinator
Michelle Meyer, Educational Coordinator
Alicia Lafrance, MPH, MSW, Research Analyst
Ima Varghese Mac, Project Assistant
Bruce Abbott, MLS, Consulting Librarian

The Outreach Core is the second pillar of the California Labor Laboratory (CALL) structure. The first pillar, the Center's Research, provides the evidence of the impact of emergent working conditions and the second pillar, the Outreach Core, turns that evidence into tangible, concrete, and accessible practice and policy information for public use. The Outreach Core's success rests on its ability to translate CALL's research findings into the right knowledge in the right forms to the right places. CALL's ambitious goal of describing, understanding the causes of, and mitigating the health impacts of existing and emergent working conditions with special attention paid to vulnerable workers, requires a robust and compelling outreach partner to turn this research into lasting change for good. The Outreach Core is designed to fulfill that need.

In the Outreach Core, we translate research into practice through the following four overlapping aims: 1) consolidation of known science across relevant fields of knowledge and California Labor Laboratory research; 2) dissemination of accumulated knowledge to stakeholder groups; 3) engagement in mitigation and prevention efforts through research to practice (R2P) process, development of intervention strategies, consultation with organizations, and development of policies; and 4) development of educational programming to inform the public, policymakers, labor, and industry and to develop a cadre of change agents who will work with these constituencies to improve the health and well-being of the working age population.

Consolidation of Known Science. Using the techniques of evidence-based reviews, in this activity of the Outreach Core, we performed a multi-disciplinary scoping review to collect and summarize knowledge across relevant disciplines about what fosters or impedes the creation of healthy work and, for those with traditional employment, healthy workplaces. Scoping reviews are performed when the goal is to map the literature as a prelude to summarizing it and are distinguished from systematic reviews in that the latter tend to be more focused when the research question can be more easily reduced. In the scoping review for the Outreach Core, the goal is inherently interdisciplinary: to gather the emerging wisdom across disciplinary frameworks, especially when the disciplines may not be aware of the knowledge base of other disciplines applied to the issue at hand.

The scoping review in the Outreach Core began by searching the social science, medical, and public health literatures, setting a higher priority for review articles and chapters, and systematic reviews and/or meta-analyses. With the framework from the retrieved literature from this initial foray, we built a database to archive the material and embarked on a process to make the knowledge in each chapter or article more easily accessible by constructing a "gist" statement of its findings, using the same format in each such statement. Several faculty and staff involved in the California Labor Laboratory had the requisite experience in relevant literatures to stoke the beginning of the scoping review. Dr. Banks as Director of the Interdisciplinary Center for Healthy Workplaces had done through reviews of the literature on the principles underlying the design of healthy work and workplaces while the Lab PI, Dr. Yelin, and Ms. Lafrance, the Project Analyst on the Outreach Core, had worked on medical effectiveness literature reviews as part of their roles in the California Health Benefits Review Program.

With the framework for the scoping review established through the review of medical and public health literatures, we engaged an experienced librarian, Mr. Bruce Abbott of UC, Davis, to extend the reviews to the full range of disciplines

relevant to the summarization of the literature on the risks and benefits to worker health and well-being of traditional and non-traditional workplaces. Searches of the relevant grey literature were also included in the literature and best practice reviews. Over 2,000 references were collected in the various searches, and 384 were retained after applying the inclusion and exclusion criteria to finalize the Scoping Review Database. The Database was coded to reveal similarities and differences across the sources, including codes regarding the Total Worker Health approach associated with the source (e.g., prevention, mitigation, prevention) and the intervention type (e.g., design-in, behavior change, infrastructure). Other designations were assigned to each source including the discipline and/or subdiscipline reflected in the source content. Additionally, the disciplines and subdisciplines reflected in the database were matched with each of the 75 issues listed in the NIOSH document, "Issues Relevant to Advancing Worker Well-Being Using *Total Worker Health*[®] Approaches." Analyses were conducted on the similarities and differences across Database sources to reveal the underlying structure of the TWH literature across the variables created through the codings.

As of this writing, a draft report of the scoping review has been circulated with all of the Total Worker Health COEs, and presentations of the findings and conclusions have been shared with the Total Worker Health audience. Based on feedback accumulated from reviewers, a final report is in the final stages of writing and a manuscript has been drafted for publication. We are in discussions with Dr. Chosewood, the Director of the Total Worker Health Program at NIOSH and his staff on the implications of the scoping review results, and we plan to begin the process of articulating new templates for interdisciplinary partnerships and change management practices to take advantage of the vast knowledge and expertise available across disciplines to broaden the reach and impact of Total Worker Health principles and practices. A broadened knowledge base for Total Worker Health professionals will require some revision of current and future educational programming and competency development as a consequence. We are currently in discussion with members of the Society for Total Worker Health and other health-related societies (e.g., Occupational Health Psychology) to coordinate the development of Total Worker Health professionals across disciplines. This year we have begun efforts to define our own educational programming to support the Total Worker Health profession and certification, guiding us in the selection of future sites for case studies and interventions focused on non-traditional forms of employment, and serving as input into the expansion of the research activities of the Lab through its Pilot Studies Program and grant applications for existing Lab faculty and staff.

Dissemination of Knowledge. An important goal of the Outreach Core is to inform a wide range of stakeholders about the health impacts of traditional and emergent working conditions. The stakeholders include labor and industry, researchers, advocates, and policymakers at the local, state, and national levels. One venue for the engagement with stakeholders is the Community Engagement Board to provide oversight for the ways we involve the community in our work as well as to suggest issues for the Lab to address and, with results in hand, how to spur their more effective utilization in the communities we wish to influence. Related to the work of the Community Engagement Board, each funded research project in the Lab also has an active protocol to engage communities of interest in the design and implementation of the research and interpretation of results. For example, in Project 1 on emergent working conditions, key informant interviews with members of advocacy groups for tech and rideshare workers helped focus our efforts to measure non-traditional employment and enables us to improve the comprehensiveness reliability of the survey measures.

Mitigation and prevention efforts. The Lab has completed an initial case study for applying the basic principles of *Total Worker Health*[®] to the process of designing and building a new workplace. This first study focuses on a more traditional work setting and will be paired with another case study which focuses on non-traditional employment as part of the Center's effort to compare work across traditional and non-traditional employment settings.

The Lab worked with the Hobby School of Public Affairs (HSPA) at the University of Houston (UH) as a test case for how to apply the basic principles of *Total Worker Health*[®] to the development of a new educational building in order to build into the new structure spatial and behavioral components that prevent illness and injury and promote occupant health, safety, well-being, and productivity. In the history of building construction on the UH campus, occupant physical and behavioral health and well-being have not been considered significantly at the early planning stage. The Lab was invited by the School Dean and Building Committee to collaborate with the Facilities & Construction Unit in plan development and most important, to lead the effort in determining occupant needs, potential workplace stressors, and work context factors that were important for occupant health, well-being, and productivity and should be included as critical components of the building plan. Over a period of nine months, Dr. Banks with the assistance of Drs. Alan Witt and Dustin Maneethai of UH

devised a pre-design process for collecting essential information from future building occupants and integrating occupant data into the Facilities & Construction Unit's pre-design plan. Occupant data were collected using a new methodology designed specifically for this purpose and then translated into building design requirements that meet occupant needs and preferences. Our pre-design process consisted of conducting "building vision" workshop, developing and administering work and workplace surveys, analyzing occupant data with respect to occupant experience and space requirements, summarizing survey findings, and issuing recommendations to the Facilities & Construction Unit and outside design consultants (Cannon Design) for utilization in the planning process.

Specifically, the following actions were accomplished:

- Development and delivery of a "building vision" workshop with Hobby School faculty, staff, and students (5 hours) which generated important information regarding the desired "look" and operation of the building in order to create an inclusive and highly engaging culture; a comfortable, safe and productive place to work; and a work experience that values flexibility, diversity of ideas and perspectives, and caring towards all members of the Hobby School community.
- Development and administration of a "work analysis" survey that generated information regarding each occupants' work activities (e.g., high concentration tasks, communication of confidential information, teaching and coaching, influencing others), work context factors (e.g., quiet, separation from others, stimulating environment, resource-rich), amount of time spent across categories of work activities (e.g., percentage of time spent across a typical week), and non-work amenities required to support occupant satisfaction and commitment to the organization. This survey was specifically designed to collect information that had workplace design implications, and the data analysis generated information that could be used to specify building design requirements such as the need for private office space, a café for socializing, lounges for students and faculty to mix, lounges for staff and faculty to mix, and private and confidential research spaces for government-sponsored research groups.
- Development of a set of building design concepts and principles based on the occupant data to serve as a reference point for all subsequent design decisions the Facilities & Construction Unit and Cannon Design will make to ensure occupant space design requirements are met in addition to engineering considerations. The occupant requirements are critically important to ensure physical and behavioral health, well-being, and productivity.
- Cannon Design shared a draft building plan with the Lab and the Hobby School building committee, and the plan is now being reviewed and revised based on our feedback. The Cannon Design plan will specify the building's total amount of square footage, the division of space for different purposes and floor layout, the sustainability features built into the physical structure to protect health and comfort, and the "stacking" of floors to accomplish the segregation of instructional space from faculty and researcher offices and high concentration spaces. Thus, the plan should reflect the occupants' building design requirements as communicated and memorialized in the design principles and concepts document.

The next step is to begin exploring the organizational policies, practices, and programs to layer on top of the physical workspace to build an integrated, holistic School focused on occupants' physical and psychological health, well-being, and productivity. An architectural firm has been selected to begin the actual design of the building following the building plan developed in collaboration with Cannon Design.

Policy Forum. The Policy Forum is the Labor Lab's committee devoted to identifying and engaging with key legislative and executive branch officials with involvement in issues related to our mission of understanding and mitigating emergent working conditions. To that end, we have developed relationships with the government affairs officers of the two flagship campuses of the Lab, UCSF and UC, Berkeley to identify key officials with whom to have a dialog around policy,. We are also developing the wherewithal to monitor legislation related to emergent working conditions through these relationships and are taking advantage of the database of legislation throughout the nation affecting contemporary employment that is being assembled by Lab Project 2 on inequality in the service sector and the impact of policy initiatives in mitigating the most onerous effects. Owing to restrictions put in place due to Covid, we have not held legislative meetings in Sacramento or DC, but are about to embark on such meetings. For example, the Lab PI, Dr. Yelin, and the Director of Research, Dr. Harris Adamson, are working with the government affairs officers to schedule meetings with legislators and members of the Executive Branch in DC in February during the meeting of the Association of University

Programs in Occupational Health (AUPOH). However, the most fruitful activity was the Policy Forum meeting held as the concluding session at our first annual conference in May 2022 which focused on precarity in employment. In that session, the Director of the Policy Forum, Dr. Victor Rubin, and the Director of Community Engagement, Ms. Laura Stock moderated a discussion with several important policy experts. In the session, Member of the State Assembly Ash Kalra briefed us on initiatives related to the Lab's mission and we received updates on litigation related to existing laws and regulation from a member of the Lab's External Advisory Board, Beth Ross, esq. We also received a briefing during the session from Mr. Rene Bayardo, Legislative Affairs Officer of SEIU about the issues they believe are central to their goal of bringing 20th Century workplace protections to those currently working without that safety net in the 21st Century. In addition, Dr. Harknett shared findings from Project 2 on inequalities in working conditions in the service sector in a virtual Congressional briefing organized by the Population Association of America. Dr. Schneider shared findings from Project 2 in an event organized by the Department of Labor that included Representative Rosa de Lauro and Secretary of Labor Marty Walsh. In our second annual conference on surveillance and monitoring in contemporary employment held in May 2023, Senator Alex Padilla provided an introductory address and Dr. Rubin and Ms. Rubin again closed the conference with a session on policies pertaining to worker monitoring and autonomy.

Development of educational programming. In the first two years of the California Labor Lab, we have built out a robust program of public-facing educational programs, including monthly webinars and an annual two-day conference, and began the process of developing a certificate program in *Total Worker Health*[®] focused on the needs of those working in both traditional employment, in which the worker is formally hired by the organization for which the work is done, and non-traditional employment in which either work is done outside of a formal hiring but at a workplace, or with no specific workplace, or both.

Public-Facing Programs. The purpose of the public-facing educational programs is to engage the public in the issues raised by emergent working conditions with the hope that they will be involved in efforts to improve the health of the workforce both for themselves and their colleagues as well as by engaging in efforts to improve legislation and regulation. We have held [13 webinars](#) across three series. The first series, held in Spring 2022, provided insights into the employment situation in the wake of Covid-19 in the State of California and the nation, as well as insights into one of the fastest growing sectors in the economy, warehouse workers. The series concluded with a discussion of mitigation efforts. The second series, held in Winter and Spring of 2023, concerned occupational health issues across the spectrum of blue-, pink-, and white-collar work. Topics ranged from ergonomics, homes as a workplace, organizational changes to improve health, job quality measurement, federal, state and local legal protections, and rideshare experience. The third series, which is currently underway, concerns marginalized workers. The first session in the series, given by Project 2 investigators, discussed policies affecting underrepresented worker populations, specifically those across the nation that seeks to protect such workers while those in some jurisdictions delimit their ability to secure safe working conditions. The second session shared insights from Project 1 data on alternative and contingent work and its impact on the well-being of working Californians. The third session will share Project 3 data on respiratory health among vulnerable workers in California's countertop fabrication industry.

We have held two successful [virtual conferences](#). The May 2022 conference, Precarious Work: Health & Economic Threats, provided an overview of why precarity is on the rise, and then documented the prevalence of precarious employment. The conference concluded with the first session of the Lab's Policy Forum, with a discussion that included a dialog with an influential member of the State Legislature, Assemblymember Ash Kalra. The May 2023 conference was on monitoring, surveillance, and data-gathering in contemporary employment. Speakers included several members of the CALL research team (Kristen Harknett, Daniel Schneider, and Robert Harrison), worker advocates (Lisa Kresge, Tracy Vargas, Wilneida Negrón, Tasha Joshua), and developers of workplace features that improve job quality (Kathleen Mosier, Christopher Nye, Stefano Schiavon, Karen Levy, Julia Ticona, and Lee Newman). The talks covered the impact of technology on worker well-being, the surveillance of low-wage workers, and various uses of worker data, among other topics. Additionally, Laura Stock moderated the Policy Forum with contributors from diverse organizations. Both conferences were very well-attended with over 100 attendees for each conference.

The Lab's educational programs are available for continuing education credits in various health professions. All webinars and the entire two-day annual conference have been recorded and are publicly accessible through the Labor Lab website: <https://calaborlab.ucsf.edu/educational-programs>

We are proud that our webinars have had as many as 210 viewers in real-time and that across all of the webinars and annual conferences, 2625 people have registered for our webinars and 1498 attended at least one live. Our annual conferences have been attended by 231 individuals live. For the second of the two, more than 90 attended the entire two-day conference from start to finish. All told, the public-facing programs have been attended by 1531 unique individuals live, while others have watched the webinars and at least part of the annual conferences on our website or YouTube channel.

Certificate Program in Total Worker Health®. The Lab has two principal programs to train a generation of change agents focused on the principles of *Total Worker Health®*, the Pilot Studies Program for researchers described above, and the Certificate Program for practitioners across a range of disciplines, including those interacting with workers on a daily basis as well as those who are involved in policy through law and regulation. The inputs to the Certificate Program include the overarching principles of a focus on total worker health accumulated across the NIOSH program, the affiliates, and the Centers of Excellence; the knowledge base from the scoping review outlined above; the experience of the Outreach Core Director, Dr. Banks, in running a large undergraduate program at the UC, Berkeley Haas School of Business as well as teaching there for several decades; and in discussions with the leaders of other certificate programs and among the leadership of the Lab in the core competencies that should be included in a rigorous program. To the latter end, just after this annual report is filed, the California Labor Laboratory will be holding a workshop to hone its sense of the core competencies that should be covered.

The program itself will be built around existing courses on the UCSF and UC, Berkeley campuses that address substantive and practice issues of relevance to the education of change agents, supplemented by specific introductory and culminating courses designed for the Program that will provide the context for the training and provide a way of integrating the Program around the themes of Total Worker Health®. With the list of core competencies and existing courses that can be useful for learners in the program, in the months to come we will be devising criteria for admission to the Program, target audiences for marketing it, and begin negotiations with the directors of existing degree programs on the UCSF and UC, Berkeley campuses to devise criteria as to which sets of learners would benefit from the Program and how learners enrolled in degree granting programs in the other academic units affiliated with the Certificate Program can be assured of space in the appropriate classes. We are also exploring the possibility of a parallel program for working professionals in which they would attend customized courses held over several days a few times over the course of the program, much as Executive MBA programs are conducted.

Community Engagement Activities

Research to Practice. Research to Practice (R2P), refers to the basic principle that research needs to serve a purpose and lead to action to improve the health and safety of workers and other community members. R2P also refers to the process of incorporating systematically researched interventions and solutions for broader adoption and implementation. It also involves a 'practice to research' orientation which involves setting research agendas that originate with and respond to concerns and priorities of workers, employers, and other key stakeholders. An important activity of the Lab in its first two years has been the development of the **R2P toolkit** to promote community engagement in research. This toolkit is designed to help research teams create a plan to identify and engage key stakeholders early in the research process and develop a research-to-action strategy to disseminate their most significant findings and recommended action. It also guides both researchers and communities in how to define a common set of goals for research, how to better serve community needs through this research, and how to ensure that the results have maximal effects when it is time to turn the results into actionable programs and policies.

This year, Laura Stock, Director of Community Engagement, and Monique Hosein, coordinator of LOHP's R2P work, have been working to finalize the R2P toolkit with the goals of ensuring that research projects include community engagement in research activities as well as in the design and implementation of a dissemination plan. The LOHP team has met with

CALL researchers and outreach directors at several other TWH centers around the country to discuss the important elements of an R2P plan and solicit input into the Toolkit. Ms. Stock and Ms. Hosein are now working with Jessica Gorus, from the Center for Environmental and Occupational Health (COEH) to create an easy to navigate online tool that can then be distributed to researchers within the Labor Lab and beyond.

Community Engagement Board (CEB). The California Labor Laboratory held the first meeting of the Community Engagement Board in fall, 2022; a second was held in October 2023. The Board has the goal of providing input/guidance to the Center to ensure that community and stakeholder interests are reflected in overall Center strategies; to share knowledge and experience regarding practices and mitigation strategies; to assist in development of overall outreach and dissemination plans, including identification of audiences, outreach methods, dissemination activities, etc.; and to assist in identifying and advocating for effective policy strategies to ensure the impact of Center research. The meetings have been well attended by members of organizations representing workers affected by changing working conditions in California. The list of members appears in the Evaluation and Planning section, above.

During the meetings, members provided input on a) key issues facing their members; b) suggestions for the Lab's research agenda; c) outreach and training needs; and d) suggestions for our policy agenda.

In the October 2023 meeting, the California Labor Laboratory investigators shared updates from the research and outreach teams and solicited input on how to disseminate the results, what are the key research priorities, and what are best practices for working with community stakeholders.

Research. *Rideshare Drivers Report:* Starting in mid-2022, the investigators from the Labor Occupational Health Program and part of the California Labor Laboratory served as a consultant to a research project with the Asian Law Caucus and Rideshare Drivers United to learn more about working conditions of drivers for Lyft and Uber. Our staff helped design the survey which was completed by over 800 workers and provided input on the research methodology. We were also instrumental in analyzing the results and formulating recommendations. We also reviewed and provided feedback on the draft report. The report was released in February 2023. The results of the research were presented in a CA Labor Lab webinar in February 2023. The report may be found here:

<https://www.advancingjustice-alc.org/news-resources/guides-reports/fired-by-an-app-report>

Teaching/student engagement. During this reporting period, LOHP staff have provided remote classroom presentations (including interactive activities) for graduates and undergraduates. Topics have included principles of participatory action research, research to practice, methods for engaging with community and labor stakeholders, and overview of occupational health and principles of taking action. LOHP staff provided presentations for undergraduate SPH students on Racism and Health, nurses at the UC School of Nursing on labor and occupational health, on Research to Practice, as part of STEER, COEH's summer internship program; in the TRT seminar program, for students in the UC Berkeley Labor Center internship program; as part of UCB Labor Studies, among others.

Pilot Studies Program

Edward Yelin, PhD, Principal Investigator
Carisa Harris Adamson, PhD, Co-Investigator
Laura Trupin, MPH, Co-Investigator

The Pilot Studies Program of the California Labor Lab will serve to advance the twin goals of the Center – describing the magnitude and effect of emergent working conditions on health along with preventing and mitigating health effects of adverse working conditions – by increasing the number and diversity of researchers focusing in these areas and providing opportunities to those already experienced in this work to explore emerging issues as they arise. The program will fund a series of projects that will expand the scope of research beyond the established projects proposed in this TWH Center application, allowing CALL to broaden the field of research in emergent working conditions and health and to truly serve as a laboratory for testing new concepts and ideas in this area. Specific aims of the program are: 1) To expand the number and kind of researchers addressing the relationship between emergent working conditions and health and well-being to junior investigators (graduate students, post-doctoral fellows, junior faculty) beginning a research career and to senior investigators segueing to a focus on this area; 2) To expand the range of topics covered under the broad umbrella of emergent working conditions and health and well-being by funding researchers from a wider array of disciplines and methodological orientations than the Center’s existing investigators; 3) To expand the use of the Center’s state of the art data sources by new investigators to aid in achieving the prior aims of expanding the number and kind of researchers and disciplines applied in this work; 4) To identify emerging issues consistent with the Center’s mission of improving the health of the working age population affected by emergent working conditions.

The Pilot Studies Program is supported by the California Labor Laboratory grant and contributions from the two home campuses, UCSF and UC, Berkeley. We decided to issue eight grants of up to 18 months duration in two cycles. This timing aligns the grant cycle with the availability of Lab project data. It also creates larger cohorts of grantees so that they can constitute a more vibrant community to provide peer support. By lengthening the tenure of the pilot grants, the grantees will have more time to pursue their research. Additionally, trainees will be able to align the grant period with the duration of their traineeships while junior faculty can plan for two years of summer salary support.

The first Pilot Studies RFP was issued in late fall 2022, with a due date of March 1st. In addition, our colleagues from the Center for Occupational and Environmental Health, several of whom are Lab investigators, developed a comprehensive list of universities and research organizations in California and beyond, especially tailored to include institutions serving marginalized populations such as Historically Black Universities and Colleges (HBUCs) and the campuses of the University of California (Riverside and Merced) and the California State University System with large numbers of underrepresented students and staff. Having this list helped us improve the probability that grantees would be from underrepresented groups and that grantees would address an important priority for the Lab, describing the impact of emergent working conditions on the health of marginalized populations.

The Lab received 23 applications from diverse settings, including academic institutions, non-profit organizations, and worker coalitions. The Review panel consisted of Lab investigators, including members of the Research Services Unit; members of the External Advisory Committee and Community Engagement Board, the latter to reflect community input; and, when necessary to provide substantive or methodological expertise, researchers from outside the Lab and these Lab committees. Two reviewers were assigned to an application and scored the project based on the rubric outlined in the RFP. After the scores were submitted, the Lab’s Internal Advisory Committee conducted a second, discussion-based review of the highest-scoring proposals to ensure adequate

representation of trainees and users of Lab data. The Lab decided to fund eight pilot projects and disbursed the funding on September 1st, 2023, with projects running for 12- to 18-months at the grantees' discretion. The 2023 cohort is predominantly trainees and consists of principal investigators from a wide range of organizations. The grantees have presented their research at the Lab's September and October research seminars and will continue to attend future meetings, as well as internal seminars. They will also work with the Outreach directors to disseminate their research to community stakeholders. *We are pleased that one of the projects is being conducted by a faculty member of another Total Worker Health Center, Dr. Serena Rice, from CPH-NEW.*

[A short description of each pilot project](#) is included on our website.

Outputs (November 2022-October 2023):

- RFP (request for proposals) released in November 2022
- Funded eight pilot projects

Project 1: Impact of Emergent Working Conditions on the Health of Working Age Californians

Edward Yelin, PhD, Principal Investigator
Nari Rhee, PhD, Co-Investigator
Laura Trupin, MPH, Co-Investigator
Alicia Lafrance, MPH, MSW, Project Analyst
Ima Varghese Mac, Project Assistant

The overarching aim of the proposed project is to evaluate the impact of the totality of change in work as well as of important sentinel working conditions that are part of that change on the health of the working age population. Three major changes are noted: the growth of alternative ways that workers are hired, spanning task-, project-, and contract-based employment; increase in contingent forms of employment; and erosion of traditional working conditions. Specific aims are to: 1) develop a survey instrument capable of measuring several axes of change in work and a range of adverse health outcomes; 2) compare the utility of individual axes of emergent working conditions singly and in combination to predict changes in health status of the working age population over time and to estimate the critical individual sentinel working conditions within the axes in determining future health status; and 3) evaluate the changes in the organization of work as defined by the axes of change and important sentinel individual conditions for the health of vulnerable groups in the labor force.

The context for this project is that many analysts have noted that the labor market measures that have been developed do a poor job of characterizing alternative and contingent forms of employment.

The major activity of the first year of Project 1 was to develop a large-scale survey instrument- the California Work and Health Survey (CWHS) - to be conducted among a random sample of up to 5,000 working age Californians. In the first year, Project 1 staff conducted key informant interviews with authorities with expertise in traditional and emergent forms of employment. Nine key informant interviews were conducted, spanning leaders of organizations of janitors, day laborers, restaurant workers, ride share drivers, contract and freelance tech workers, an HR leader of an organization that used a professional employment organization or PEO (PEOs jointly hire workers with firms, usually to handle the administrative side of employment so that the firm can concentrate on the substance of their operations), and the founder of one of the largest PEOs. Based on the information from these key informants, several draft survey measures were deemed acceptable for inclusion in the cognitive interview phase of the project.

Cognitive interviewing was then conducted with proposed survey measures. Cognitive interviewing is the process of engaging respondents in a dialog about how they interpreted specific measures to gain insight into how to frame the items in a more reliable way. We conducted cognitive interviews with 21 individuals across a wide range of occupations and industries. Those hired in traditional ways included several administrative persons, a day care provider, professional at an engineering firm, and meat manager at a market; those hired in alternative ways included several doing delivery through an app-based firm, a ride share worker, and a free-lance copy-writer, among others.

Although our initial purpose in doing both the key informant and cognitive interviews was to assist in the development of survey items, when the team members reviewed the interview material, it became clear that we had an important data source on what it means to have a job in the contemporary economy. As a result, in year two, we embarked on a formal attempt to analyze the interview material to help frame experiences about working, particularly as it relates to the emerging work trends and the weakening of 20th century workplace protections.

Through qualitative analyses of the key informant and cognitive interview material, we published several blog posts to better characterize the complex issues affecting workers and offer insights into how to address them. The blog posts covered the following worker issues: complexities in the California Labor Market, manifestations of wage theft, and resources for workers related to the challenges we have noted so far. Later, we may also use stories from the qualitative

interviews about worker experiences to elucidate statistical findings from the CWHS into a paper for submission to a professional journal.

After completion of the key informant and cognitive interviews, we inserted the new measures of alternative and contingent employment into the survey draft, conducted pre-tests of the draft instrument, and began conducting interviews in November 2022. Because of the length of the survey, we offered the option to respondents to complete it either over the telephone or on-line. Data collection finished in May 2023 with a total of 4,014 respondents, of whom 74% opted for on-line completion.

The purpose of the CWHS was to capture information about the employment and health status of California adults. There are three major sections of the questionnaire section - employment, health, and economic wellbeing. One special feature of the employment section is the collection of information on jobs held in the past month as well as the past week. The rationale is that alternative and contingent forms of employment may be episodic and less likely to be captured in data collection solely about the week prior to interview. The survey includes detailed questions about employment status and, among those working, work arrangements, working conditions, and occupation and industry of the job. The health section includes questions about overall physical and mental health status, along with questions concerning chronic illness diagnoses, functional limitations, pain and other symptoms, perceived stress, occupational injury, height, weight, health behaviors, and health insurance coverage. The final section includes basic demographic information, including household composition, paid and unpaid caregiving for household/family members, household income and individual earnings, benefit reciprocity, and financial strain. After data collection was completed, sampling weights were developed so that the responses are generalizable to the non-institutionalized California population, aged 18-70.

The Project 1 investigators are currently conducting analyses of the dataset and presenting initial findings. In addition, we have made a public use dataset which can be made available to researchers outside of the CA Labor Lab, upon request. As of this writing, the dataset has been released to one of the CA Labor Lab pilot project grantees, [Dr. Ashley Membere](#), and is also being used for a student research project in the UC Berkeley School of Public Health.

This Fall, we presented a series of webinars about the results of the California Work and Health Survey, two focusing on the prevalence and impact of alternative, contingent, and app-based employment and one concerning monitoring and surveillance of work. With respect to the prevalence, because we asked about the thirty days prior to interview as well as the standard seven days of Bureau of Labor Statistics surveys and about a second job in either time-frame, we identified as much as a 46% increase in the number of persons working in jobs of these characteristics. We also observed that persons in alternative, contingent, and app-based employment were more likely to have low earnings and low household income and more likely to be at or below 125% of the Federal Poverty Level. Such persons were more likely to be SNAP beneficiaries and to report usage of food banks. They were also more likely to report that hardship in food, housing, or medical care in the ensuing two months was a risk. With respect to surveillance and monitoring, about two of every five workers reports having their work activities tracked. Workers in temporary agencies, subcontracted labor, on-call, contingent, and app-based workers have significantly higher rates of tracking. Surveillance through tracking was associated with higher rates of fair/poor health, mental health, and presence of anxiety, depression, or irritability. Finally, tracked workers were more likely to report piece work; wage theft; rotating, split, or variable shifts; required overtime; and bullying on the job.

More information about the CWHS, including the full list of survey topics and a data request form, is available on the [CA Labor Lab website](#).

Presentations.

1. Ed Yelin. Total Worker Health in Traditional and Alternative Employment: Who Takes Responsibility for Workers' Well-Being? Talk given to UCSF Occupational and Environmental Medicine CME, March 22, 2022.
2. Ed Yelin. UCB Total Worker Health in Traditional and Alternative Employment: Who Takes Responsibility for Workers' Well-Being? Talk given to Northern California Center for Occupational and Environmental Medicine, November 10, 2022.
3. Ed Yelin. Traditional and Alternative Employment in Contemporary Work. Talk given to UC Davis Center for Occupational and Environmental Health, February 4, 2023.

4. Ed Yelin. Prevalence and Impact of Alternative, Contingent, and App-Based Employment: First Estimates from the California Work and Health Survey. Presentation given at NIOSH Webinar, October 19, 2023.
5. Ed Yelin. The Future of Work is Now: Results from the California Work and Health Survey. Presentation given at California Labor Laboratory Webinar, October 25, 2023.
6. Ed Yelin. Surveillance and Monitoring in Contemporary Employment. Talk given at Society for Total Worker Health Peer Learning Webinar, November 2, 2023.

Published Blog Posts.

1. [The Complex Reality of the California Labor Market: Untangling the Issues](#) by Ima Varghese Mac and Alicia LaFrance, MPH, MSW on July 31, 2023.
2. [The Stealthy Thief: Manifestations of Indirect Wage Theft and Lived Examples](#) by Alicia LaFrance, MPH, MSW on September 20, 2023.
3. [Tackling Workplace Challenges: Resources for Bay Area Workers](#) by Ima Varghese Mac on October 11, 2023.
4. Context for the Presentation on the Prevalence and Impact of Emergent Working Conditions: NIOSH Future of Work Webinar by Ed Yelin on October 19, 2023.

Products.

California Work and Health Public Use Dataset. October 2023. [Access to the dataset is granted on a per request basis.]

Project 2: Inequality in Job Conditions in the Service Sector

Kristen Harknett, PhD, Co-Principal Investigator

Daniel Schneider, PhD, Co-Principal Investigator

Rebecca Wolfe, Project Analyst

Working conditions influence population health and contribute to disparities in a range of health outcomes, and these conditions have deteriorated over the past forty years. Much of the research on precarious working conditions has focused narrowly on hourly wages, but precarious working conditions go beyond wages and include multiple dimensions such as schedule control, predictability, and stability; paid time off, health insurance, and other fringe benefits; as well as job security and job satisfaction. Precarious work schedules, lack of benefits, and job insecurity and dissatisfaction are particularly pronounced for the nearly 20% of American workers employed in the service (including retail, grocery, food service) sectors. These sectors have also been sites of legislative interventions to improve job quality, with states and localities implementing higher minimum wages but also passing laws that require large private sector employers to provide greater work schedule stability and predictability, offer paid sick leave, and provide access to paid family and medical leave. This set of precarious working conditions is not equally distributed across social groups. Occupational attainment varies across gender and race/ethnic groups, and precarious working conditions are likely to disproportionately affect those who identify as female, non-binary, or transgender and African American and Hispanic workers.

There is also little existing data that captures multi-dimensional measures of job quality and that allow comparisons across policy environments and employers. To fill this gap, we use data from The Shift Project from over 150,000 service sector workers nested in 150 large firms, collected from 2017-2022. We have separate NIA funding (R01) to collect data from additional workers and to follow a subset of workers longitudinally between 2021-2024.

We use this data to accomplish three key aims: 1) Document gender and race/ethnic inequality in a set of work conditions that are social determinants of health but are typically absent from national data sources; 2) estimate the effects of local labor laws and higher road employment practices on unequal working conditions; and 3) examine the effects of the COVID19 shock on job displacement and inequality in work conditions.

Our major activities in the first year of our project included producing three new manuscripts, disseminating research at academic conferences and in briefing with policymakers, and compiling a database of state and local labor policies. In the second year of our project, major activities included (1) producing a peer-reviewed journal publication, (2) producing a database of state and local labor policies, and (3) presenting our research to audiences of policymakers and researchers. We describe each of these activities below.

- (1) In a paper forthcoming in the journal, *Sociological Science*, we draw on data from 13,574 hourly service-sector workers to extend the study of intersectional labor market inequalities to workers' experience on the job. In the service sector, where workers are regularly expected to be on their feet for long hours and to contend with workloads that are intense and unrelenting, regular break time is an essential component of job quality and general well-being. Yet, we find that Black women are less likely than their counterparts to get a break during their work shift. Although union membership and laws mandating work breaks are effective in increasing access to breaks for workers overall, they do not ameliorate the inequality Black women face in access to work breaks within the service sector.
- (2) We compiled a state and county policy database, which documents efforts made by states and local governments to expand or curtail protections for workers. Data includes policies affecting wages, schedules, paid time off, COVID-19 safety measures, and some often-overlooked aspects of worker protections such as the rights and protections of transgender and nonbinary workers and undocumented workers. This data offers insight into a

changing policy landscape for workers in a polarized legal landscape and serves as a public resource for labor and policy researchers interested in policy impacts.

The database is posted to GitHub, and we are currently working to make it publicly accessible to other researchers interested in understanding how policy environments influence working conditions, which are social determinants of health. In year three, we are planning to create a data page at The Shift Project website that will house this policy database and its accompanying documentation.

- (3) In May 2023, we presented our research on how workplace technologies are affecting low-wage service sector workers at the annual convening of the California Labor Lab Conference in May 2023. In September 2023, we presented findings from our state and local policy database in a webinar hosted by the California Labor Lab.

Papers and presentations

1. Harknett, Kristen. "*Precarious Work in the Service Sector*" Virtual Briefing for Policymakers Regarding COVID Economic Relief, organized by the Association of Population Centers. September 2022.
2. Schneider, Daniel, Panelist. Department of Labor convening. September 2022.
3. Harknett, Kristen and Daniel Schneider. "Paid Sick Leave Mandates Narrow Gender Gaps in Paid Sick Leave Coverage for Low-Wage Workers" [[Health Affairs](#), Nov 2022]
4. Harknett, Kristen, Charlotte O'Herron, and Evelyn Bellew. "Can't Catch a Break: Intersectional Inequalities at Work" [forthcoming, *Sociological Science*]
5. Harknett, Kristen and Daniel Schneider. "[Workplace Technology and Worker Well-Being](#)" California Labor Lab Annual Conference. May 2023.
6. Harknett, Kristen. "[Unequal Rights: The Patchwork of State and Local Labor Protections in the U.S.](#)" California Labor Lab Webinar. September 2023.

Products

State and local policy database.

Project 3: California Artificial Stone and Silicosis (CASS) Project

Kristin Cummings, MD, MPH, Co-Principal Investigator

Robert Harrison, MD, MPH, Co-Principal Investigator

Amy Heinzerling, MD, MPH, Co-Investigator

Fernanda Florez, Research Associate

Jennifer Flattery, MPH, Epidemiologist

California workers who fabricate countertops using artificial stone are at risk of developing accelerated silicosis, a severe, incurable, and potentially fatal lung disease that is completely preventable.¹ The Occupational Health Branch (OHB) of the California Department of Public Health (CDPH) has been instrumental in characterizing this emerging occupational health issue in California.

The burden of silicosis in California's countertop fabrication industry is unknown, but it is likely that these cases and the handful of others that have been reported to OHB in the last year represent the tip of the iceberg in an industry that employs at least 9,000 people statewide. The traditional approach to workplace hazards is regulation by the California Division of Occupational Safety and Health (Cal/OSHA). Indeed, occupational exposure to silica has been regulated for decades, and more protective standards comprising a lower exposure limit and requirements for exposure monitoring, exposure controls including respiratory protection, and medical surveillance were introduced in 2016. Yet the occurrence of advanced and fatal lung disease in young silica-exposed workers highlights the limitations of this strategy for the countertop fabrication industry.

The overarching aim of this project is to promote respiratory health among vulnerable workers in California's countertop fabrication industry through education, medical monitoring, and statewide enhanced surveillance. The overall hypothesis of this project is that a multifaceted public health intervention will increase compliance with silica regulations and the detection of silicosis in the contemporary workplaces of California's countertop fabrication industry. The specific aims are to: 1) increase awareness in the countertop fabrication industry about the risk of silicosis to workers using artificial stone and methods for effective strategies for prevention; 2) facilitate medical monitoring of silica-exposed workers in the countertop fabrication industry; and, 3) enhance public health surveillance of silicosis related to working with artificial stone through increased reporting.

This surveillance project will use data per OHB's legal mandate (under Health and Safety Code §105175) to collect and summarize statistics describing the causes and prevalence of work-induced diseases in California.

During the second year of the CASS Project, we made substantial progress on all three project aims.

For Aim 1, our activities relate to educational messages for California-based countertop fabrication employers and workers. On the basis of literature reviews and employer and worker interviews conducted in Year 1, the team decided to develop the following health communications: 1) Air Monitoring for Silica: An Employer Guide and 2) Respirable Crystalline Silica Standard Overview. We chose to develop both materials with countertop fabrication employers as the intended audience to help explain and demystify the regulation and the process of workplace air monitoring. The importance of air monitoring and the need to be in compliance with the Cal/OSHA silica standard were identified as topics which needed further attention and for which extant resources were lacking.

During Year 2, both documents were finalized and posted to the OHB silica website:

<https://www.cdph.ca.gov/Programs/CCDCPP/DEODC/OHB/Pages/SilicaStoneFabricators.aspx>. In addition, during Year 2, hardcopies of these documents were included with a letter from Cal/OSHA that was mailed to more than 800 countertop fabrication shops alerting them to the hazards of engineered stone and their responsibilities under current regulations: <https://www.dir.ca.gov/doshpol/letters/Countertop-Employers-Letter.pdf>. In addition, we adapted a previously

published lengthy hazard warning for workers to a more user-friendly format, also posted to the OHB silica website. We had this document translated into Spanish and Chinese for the diverse worker population in this industry.

For Aim 2, our activities relate to the development of training materials for continuing medical education (CME) on silicosis and the design of a pilot study comparing routine and enhanced testing protocols for detecting silicosis.

For the CME, we finalized the content and identified an entity that can host the training materials and offer CME credits to occupational medicine physicians, pulmonologists, and other healthcare providers who are the target audience. We negotiated a sub-contract with University of California, Davis, which has hosted OHB CME in the past. Unfortunately, UC Davis had an unanticipated software issue that has delayed the posting of the CME course. We anticipate being able to post and publicize the CME early in Year 3.

In the meantime, we published a Health Advisory through the California Health Alert Network (CAHAN), the official public health alerting and notification program for California. The CAHAN, “Global Epidemic Comes to California: Silicosis in Countertop Workers,” is addressed to healthcare providers and local health departments

(<https://www.cdph.ca.gov/Programs/OPA/Pages/CAHAN/Global-Epidemic-Comes-to-California-Silicosis-in-Countertop-Workers.aspx>). It describes the epidemic of silicosis related to engineered stone in California and recommends active surveillance and case reporting. The CAHAN was adapted by several large jurisdictions (including Los Angeles and San Diego) and sent out to their local provider networks.

In addition, we developed an “Information for Providers” section on our website (<https://www.cdph.ca.gov/Programs/CCDPPH/DEODC/OHB/Pages/SilicaStoneFabricators.aspx>) that includes information about how to recognize and report cases of silicosis to CDPH. We included a link to a new one-page fact sheet that we developed called “Silicosis in Countertop Fabrication Workers: What Providers Need to Know” (<https://www.cdph.ca.gov/Programs/CCDPPH/DEODC/OHB/CDPH%20Document%20Library/SilicosisinCountertopFabricationWorkersWhatProvidersNeedtoKnow.pdf>). This fact sheet provides background information on silicosis, engineered stone, and the risks of countertop fabrication, as well as diagnostic criteria and treatment options. It also includes information about Workers’ Compensation and reporting cases to CDPH.

For the pilot study, we identified UCLA-Olive View Medical Center as a research partner, with Drs. Jane Fazio and Nader Kamangar as site investigators. We chose UCLA-Olive View Medical Center because this Los Angeles County public hospital is located near a large concentration of countertop fabrication shops. To date, the physicians at this hospital have diagnosed and cared for the majority of the State’s cases of silicosis related to engineered stone. Should any study participant have abnormalities on study testing that merit further diagnostic work-up, Drs. Fazio and Kamangar will be able to offer that clinical care, regardless of the participant’s ability to pay.

We worked with Drs. Fazio and Kamangar to establish a subcontract for UCLA-Olive View Medical Center to conduct participant enrollment and medical testing (chest radiography, chest computed tomography, full pulmonary function tests, and blood biomarkers). We renewed our Institutional Review Board (IRB) approval with the California Health and Human Services Agency’s Committee for the Protection of Human Subjects (CPHS), as required on an annual basis, and also received approval for amendments that reflect the partnership with UCLA-Olive View Medical Center. We developed a REDCap database for collection of the questionnaire responses and clinical data. At the close of Year 2, we began study recruitment. We anticipate meeting our recruitment targets in Year 3.

For Aim 3, our activities relate to exploring options for increased reporting of silicosis cases to OHB. During Year 2, we pursued multiple pathways for increased reporting. In addition to raising awareness among clinicians and local health jurisdictions through the CAHAN and web-based resources described above, we published a case series describing the first 52 cases of silicosis related to engineered stone in California

(<https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2807615>). This publication in *JAMA Internal Medicine* was accompanied by an editorial (<https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2807621>) and podcast (<https://edhub.ama-assn.org/jn-learning/audio-player/18801278?resultClick=1>). The case series generated local, state, and national media attention and contributed to several recent policy decisions: Cal/OSHA proposed emergency changes to the silica standard to address the hazards of engineered stone (<https://www.dir.ca.gov/dosh/doshreg/Silica/>) and the LA County Board of Supervisors declared June “Silicosis Awareness

Month,” directing several county departments to report back with recommendations concerning a county ban on engineered stone (<https://file.lacounty.gov/SDSInter/bos/supdocs/f788a542-a82a-4c3b-be8b-1e4daba58db9.pdf>).

We developed a reporting form for healthcare providers to contact us if they have identified a patient with silicosis. A link to this form was posted on our website, along with a dedicated email address that can be used as well (<https://www.cdph.ca.gov/Programs/CCDC/DEODC/OHB/Pages/SilicaStoneFabricators.aspx#>).

In addition, we continued to explore the Reportable Conditions Knowledge Management System (RCKMS) as a mechanism for automatic reporting from the electronic health record of participating health care organizations. We began receiving data in December 2022; through July 2023, we received initial case reports including silicosis for 41 persons. A brief report summarizing our experience to date was accepted for publication by CDC’s *MMWR*. Finally, we initiated the process to add silicosis to the Title 17 list of reportable conditions. We presented to and received approval from CDPH leadership and the California Conference of Local Health Officers (CCLHO). We anticipate that the regulatory steps will be completed in early 2024. We are now working with CDPH partners to develop a reporting form within CalREDIE (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/CalREDIE.aspx>), the state’s secure system for electronic disease reporting and surveillance. We are thus ahead of schedule for our Aim 3 milestones.

Papers and Presentations.

1. Surasi K, Ballen B, Weinberg JL, Materna B, Harrison R, Cummings KJ, Heinzerling A. Elevated exposures to respirable crystalline silica among engineered stone fabrication workers in California, January 2019—February 2020. *Am J Ind Med.* 2022;65(9):701-707.
2. Spiegel A, Cummings KJ, Flattery J, Harrison R, Heinzerling A. Self-reported silica exposures and workplace protections among engineered stone fabrication workers in California. *Am J Ind Med.* 2022;65(12):1022-1024.
3. Gandhi S, Heinzerling A, Flattery J, Alam A, Cummings K, Harrison R. Active surveillance of artificial stone workers facilitates early identification of silicosis. *Am J Respir Crit Care Med.* 2022;205:A2497. Poster presentation at the American Thoracic Society International Conference, May 16, 2022.
4. Cummings KJ. Silicosis related to engineered stone in California. Presentation at the Western States Occupational Network (WestON) – 13th Annual Meeting, Council of State and Territorial Epidemiologists, NIOSH Western States Division, Denver, Colorado, September 15, 2022.
5. Fazio J, Gandhi SA, Flattery J, Heinzerling A, Kamangar N, Afif N, Cummings KJ, Harrison RJ. Identification of a statewide epidemic of silicosis among engineered stone fabrication workers – California. *Am J Respir Crit Care Med.* 2023;207:A4359. Oral presentation at the American Thoracic Society International Conference, May 22, 2023.
6. Gandhi SA, Heinzerling A, Flattery F, Cummings KJ. Occupational contributions to respiratory health disparities. *Clin Chest Med.* 2023;44(3):635-649.
7. Fazio JC, Gandhi SA, Flattery J, Heinzerling A, Kamangar N, Afif N, Cummings KJ, Harrison RJ. Silicosis among immigrant engineered stone (quartz) countertop fabrication workers in California. *JAMA Intern Med.* 2023;183(9):991-998.
8. Gandhi SA, Heinzerling A, Flattery J, Fazio JC, Alam A, Cummings KJ, Harrison RJ. Active surveillance of engineered stone workers facilitates early identification of silicosis: A discussion of surveillance of occupational lung diseases. *New Solut.* 2023; 33(2-3):119-129.
9. Flattery J, Woolsey C, Epstein-Corbin M, Blackley DJ, Harrison RJ, Cummings KJ. Surveillance of silicosis using the Reportable Conditions Knowledge Management System — California, December 2022–July 2023. *MMWR Morb Mortal Wkly Rep.* 2023; in press.

Products.

Available at:

<https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/Pages/SilicaStoneFabricators.aspx#>

Workplace Air Monitoring for Silica: Employer Guide.

Respirable Crystalline Silica Standard Overview.

Hazard Alert for Workers: Silica Dust from Countertop Work Can Harm You!

Silicosis Reporting Form.

Silicosis in Countertop Fabrication Workers: What Providers Need to Know.

Available at:

<https://www.cdph.ca.gov/Programs/OPA/Pages/CAHAN/Global-Epidemic-Comes-to-California-Silicosis-in-Countertop-Workers.aspx>

Global Epidemic Comes to California: Silicosis in Countertop Workers.