The Hazard Evaluation System and Information Service, or HESIS, was established in 1978 by California Labor Code 147.2. HESIS is located within the California Department of Public Health (CDPH, Occupational Health Branch (OHB, and is supported by an interagency agreement with the California Department of Industrial Relations (DIR. The HESIS annual budget for July 1, 2019, to June 30, 2020, was $1,215,672; the current budget, for July 2020–June 2021, is $1,270,129.

HESIS work extends far beyond its original legislative mandate to “establish and operate a repository of current data on toxic materials and harmful physical agents in use or potentially in use in places of employment in the state.” HESIS’s mission is to identify, evaluate, and provide “early warning” and up-to-date, practical information on toxic chemicals and other workplace hazards so that employers, workers, health and safety professionals, and others can take action to make workplaces safer.

This report describes HESIS’s major activities. These include how HESIS operates as a reliable source of technical assistance in the occupational health and safety community, how HESIS staff investigate new and unrecognized workplace hazards, and how they make the information available to a variety of stakeholders to prevent work-related illness. The report highlights just a few of HESIS’s major accomplishments in 2019–2020. Importantly, the report details HESIS’s critical role in supporting DIR’s Division of Occupational Safety and Health (Cal/OSHA) in promulgating protective occupational health standards by providing toxicological information and recommending health-protective exposure limits. Finally, the report provides a few examples of where HESIS has worked collaboratively with others on public health projects and activities to improve workplace safety and health in California.

This report year has been unlike any other. With the state of California facing its most serious public health crisis in decades, HESIS has been called upon—and risen to the challenge of—devoting many of its resources in service of the CDPH response to the COVID-19 pandemic. The report describes how the unique knowledge, expertise, and dedication of HESIS and other OHB staff have been mobilized to protect the workers of California from this deadly virus. This has highlighted the importance of the occupational health and safety work we do in CDPH, and forged relationships with partners that will strengthen our future work.
WHAT WE DO

Establish health effects of potentially harmful workplace exposures
HESIS plays a critical role in identifying new or unappreciated workplace hazards to provide early warning in order to protect worker health. HESIS staff collect and evaluate toxicological studies and other relevant information to identify chemicals and physical agents that may be harmful to worker health. We use the peer-reviewed scientific literature, published reports, and various databases to ascertain whether harmful substances are being used in California workplaces and, if so, how much.

HESIS maintains a “repository” of this information. We serve as a resource to other occupational and public health agencies, Cal/OSHA, local health jurisdictions, employers, and health and safety advocates. HESIS staff also provide technical assistance to other agencies on hazard evaluations of selected chemicals or workplace exposures.

Provide reliable hazard information
HESIS is a well-known and trusted source of occupational health and toxicological information on workplace hazards; many individuals and groups turn to us when they need help or answers to their questions. Cal/OSHA relies on HESIS to provide top-rate technical assistance and guidance on a range of topics for its rulemaking, enforcement, and educational activities. HESIS staff regularly review Cal/OSHA and other agency guidance documents, contribute to scientific publications, and present at meetings and conferences.

HESIS places a high priority on providing information that is of practical use. HESIS operates the Workplace Hazard Helpline (Telephone Response System or TRS), a toll-free telephone number that workers, employers, physicians, and others in California use to ask questions about the health effects of chemicals, potential workplace exposures, regulatory standards, and workers’ rights. HESIS uses what we learn from these calls and interactions to identify trends in workplace exposures, areas that need more research, and educational outreach and materials that are needed. We develop and disseminate informational products and materials through our stakeholders and collaborate with a variety of partners to address new or underappreciated workplace hazards and improve the work environment.
WHAT WE DO

Develop strategies for hazard reduction and disease prevention
HESIS uses its authority under California’s SB 193 of 2014 to obtain customer lists from manufacturers who sell products that represent newly recognized health hazards for California workplaces. We use this information to contact companies where the products are being used to conduct targeted hazard evaluations, develop prevention recommendations, and provide information employers and workers can use to improve safety and health at their workplaces.

HESIS staff provide extensive support to the CDPH whenever it must respond to a public health emergency that involves workplace health and safety, as in the case of COVID-19. We develop workplace guidance; review draft regulations and guidance from other state agencies; respond to questions from health care facilities, local health jurisdictions, and the public; and participate in developing and disseminating critical health education materials about the emergency.

Recommend occupational safety and health standards
HESIS supports the work of the Cal/OSHA Health Effects Advisory Committee (HEAC in the development of permissible exposure limits (PELs) for airborne contaminants, published in the California Code of Regulations, Title 8, Section 5155. HESIS staff obtain and analyze data to evaluate harmful chemical exposures in California workplaces. To prevent possible adverse health effects, we provide toxicological information and make recommendations for new or revised PELs. HESIS also conducts its own research and presents recommendations to minimize exposure to harmful airborne contaminants not yet recognized or addressed by the HEAC.

HESIS provides similar support for Cal/OSHA standard-setting on other workplace hazards by providing technical assistance to other standard advisory committees. We assist Cal/OSHA staff with evaluating complex technical data for the purpose of developing standard language and responding to inquiries, statements, and proposals from stakeholders.
FULFILLING OUR MISSION: PROVIDING RELIABLE HAZARD INFORMATION

The need

Workers and their advocates, employers, and health care providers need reliable information on the possible hazards of exposure to toxic materials and harmful physical agents in the workplace. Californians need a place to call to get the answers to specific questions about the health effects of specific chemicals, how exposure takes place, and what employers must do to protect their employees.

Cal/OSHA and other programs in the Department of Industrial Relations, programs within the CDPH, and other agencies require technical support and consultation about occupational health issues to perform important roles in protecting public health. This support and consultation are also critical to developing effective health-protective workplace standards. Sometimes, time is of the essence, and a rapid response is needed.

What HESIS did in 2019–2020

Responded to inquiries from the public. HESIS responded to calls from dozens of workers, worker advocates, and employers through its Workplace Hazard Helpline. HESIS staff answered questions about exposures to chemical, biological, and physical agents and recommended prevention measures on a wide range of topics.

A toxicologist from a school district inquired about regulations covering patching compounds that could contain the chemical styrene. HESIS provided CDPH guidance on strategies for asthma prevention through building product selection that schools can use, authoritative resources that characterize styrene as a sensitizer and asthmagen, and recommendations for minimizing exposures.

Provided technical support for occupational health standards. HESIS assisted Cal/OSHA’s Research and Standards Unit and Medical Unit in their evaluation of petitions and development of workplace standards by conducting systematic literature reviews, providing bibliographies with the abstracts and full text of articles, and reviewing proposed standards language and guidance documents. Hazardous substances addressed by these petitions and standards include antineoplastic agents, surgical smoke, mold in workplaces, and wildfire smoke.
What HESIS did in 2019-2020

Investigated hazardous working conditions due to chemical exposures

When the Occupational Health Branch identified a particularly young patient with silicosis, an incurable and potentially fatal occupational lung disease caused by breathing fine silica particles, HESIS participated in an investigation of a countertop fabrication shop. The investigation found several additional workers with silicosis. HESIS helped alert workers and employers about the problem and provided recommendations and resources for protecting workers from silica in this industry.

Provided technical support to California’s Office of the Attorney General

For a multi-state suit against the US EPA concerning the collection of information about asbestos, HESIS provided a declaration supporting California’s use of and need for accurate, reliable, and complete data compiled and reported under the Chemical Data Reporting (CDR rule.

Answered questions about unsafe conditions during the COVID-19 pandemic.

A consulting physician asked whether use of a quaternary ammonium disinfectant presented a hazard in schools. HESIS reviewed the literature and consulted with colleagues at Cal EPA’s Office of Environmental Health Hazard Assessment and the National Institute for Occupational Safety and Health (NIOSH), then recommended that the school district avoid the use of these disinfectants because they present a risk of asthma to children as well as to staff members who use them.
FULFILLING OUR MISSION: PROVIDING RELIABLE HAZARD INFORMATION

Impact

- The updated literature review on medical surveillance provided by HESIS will help Cal/OSHA’s Research and Standards Unit and Medical Unit prepare a well-informed, up-to-date regulation on antineoplastic drugs to better protect oncology technicians, nurses, and pharmacy technicians against antineoplastic drug hazards.

- The silica investigation of a countertop fabrication shop helped identify several additional workers with evidence of silicosis. These workers were able to seek medical evaluation and treatment. The resources that HESIS mobilized to address this issue will assist in making workers and employers aware of the problem, provide them with tools for better protecting workers, and raise awareness of the need for more comprehensive approach to this widespread problem.

- Current literature provided by HESIS to Cal/OSHA supports the development of exposure limits and comprehensive regulations that help protect California workers from exposure to hazardous substances.

- In the multi-state suit against the US EPA, the US District Court cited HESIS’s declaration in its ruling in favor of the states and requiring the US EPA to collect information about asbestos under the CDR rule.
The Need

Thousands of chemicals are used in California workplaces every year; some of them are regulated, but many are not. Although regulatory requirements may ultimately be put in place to reduce or eliminate worker exposures, that process can take a long time and is not likely to result in the regulation of all chemicals that pose a potential hazard in the workplace. New hazard information about these chemicals should inform workplace practices as soon as it is available; workplaces need strategies to protect workers now.

The challenges include limited to no information about which workplaces in California use a chemical; missing or poor-quality information on the safety data sheets (SDS used for hazard communication; and lack of access to reliable substitutes that are less hazardous.

Senate Bill 193 of 2014 gave HESIS the authority to obtain customer lists from chemical manufacturers and other suppliers of workplace chemicals when those chemicals are identified as posing a new or unrecognized health risk to workers. HESIS previously used this authority to obtain customer lists for 1-bromopropane (1-BP, a solvent used in degreasing and spray adhesives. 1-BP is a known neurotoxicant, a known reproductive and developmental toxicant, and a newly recognized carcinogen. HESIS identified approximately 360 “end-users” of 1-BP-containing products in California.
FULFILLING OUR MISSION: DEVELOPING STRATEGIES FOR HAZARD REDUCTION AND DISEASE PREVENTION

What HESIS did in 2019–2020

In 2019-2020, we continued to address the novel toxicity of 1-BP:

- HESIS reviewed over 40 SDSs for 1-BP-containing cleaning solvents and degreasers to determine whether they communicated up-to-date, accurate hazard information to potential users. We found that about half had deficiencies in communicating the recognized health hazards of 1-BP. We prepared individualized letters for those manufacturers to request that they revise their SDSs and give updated, accurate SDSs to their customers.

- HESIS provided summary data characterizing industries, applications, and volumes of use of 1-BP products to Cal/OSHA for rulemaking at its Health Effects Advisory Committee meeting on December 3, 2019.

- HESIS worked with a toxic use reduction specialist to develop and test alternatives to 1-BP products for use in the industries and applications we had identified as the most hazardous. We recruited companies in these industries to try out the alternatives and assisted them with converting to the safer alternatives.
FULFILLING OUR MISSION: DEVELOPING STRATEGIES FOR HAZARD REDUCTION AND DISEASE PREVENTION

Impact

- A medical device manufacturer successfully switched from 1-BP to a safer water-based cleaning process to remove contaminants from their printed circuit boards.

- An optical parts manufacturer agreed to change from 1-BP to a water-based cleaner to remove pitch and wax from optical components. Although the company was unable to purchase the new cleaning equipment required immediately because of the COVID-19 economic downturn, they now have the information they need to take this step later.

- HESIS is preparing information to share with other 1-BP users of similar applications on how to successfully substitute safer cleaning processes and degreasers for 1-BP.

- This project produced materials, procedures, and a database that can be used for future chemical hazard tracking; it serves as a model for future HESIS work on early warning and promoting safer alternatives when new chemical hazard information becomes available.

- 1-BP is now on the priority list of chemicals to be considered by Cal/OSHA in the next rulemaking cycle.
FULFILLING OUR MISSION: SUPPORTING THE DEVELOPMENT OF OCCUPATIONAL HEALTH STANDARDS

The Need

The Cal/OSHA Health Effects Advisory Committee (HEAC) provides advisory input to the Occupational Safety and Health Standards Board on the adoption of new or revised exposure limits for airborne contaminants, called Permissible Exposure Limits (PELs). The HEAC is composed of members with expertise in toxicology, epidemiology, occupational medicine, and industrial hygiene. HEAC reviews, evaluates, and discusses scientific knowledge of health effects from exposure to chemicals selected by Cal/OSHA and considers the feasibility and impact of a proposed new or revised PEL.

The committee required HESIS technical support for their standard recommendations on exposure to three chemicals: benzophenone, turpentine, and sulfur dioxide.

- **Benzophenone** is used in flavoring and perfumes; ink and coatings; and the manufacture of antihistamines, hypnotics, and insecticides. Exposure to benzophenone can cause cancer and adverse effects on the skin, liver, and kidney.

- **Turpentine** is used as a solvent for surface coatings, liniments, and perfumes, as an intermediate in the synthesis of camphor and menthol, in paint thinner, and in veterinary medicine. Exposure to turpentine can cause adverse respiratory effects, including asthma, and dermal sensitization.

- **Sulfur dioxide** is used to make sulfuric acid; in paper and food production; in farming, wastewater treatment, and metal and oil refining; and as a fungicide. Exposure to sulfur dioxide can cause respiratory effects, including lung cancer, as well as reproductive and developmental effects.

HESIS prepares and maintains its own priority list of workplace chemicals primarily based on the severity of health hazard (e.g., cancer and reproductive/developmental health) and suspected high use and exposure.
FULFILLING OUR MISSION: SUPPORTING THE DEVELOPMENT OF OCCUPATIONAL HEALTH STANDARDS

What HESIS did in 2019–2020

HESIS support for the development of PELs for benzophenone, turpentine, and sulfur dioxide

- Identified, reviewed, and shared new scientific information from recent articles on each chemical’s toxicity.
- Provided Cal/OSHA with relevant articles for updating the draft toxicology summary documents and developing health-based PEL recommendations.
- Reviewed the Cal/OSHA draft toxicological summary documents and provided additional comments for incorporating into their final version.
- Provided updated data and information on health hazards, recommendations for exposure limits, and other agencies’ occupational exposure limits from “authoritative bodies” at the state, federal, and international levels.
- Provided a summary of recent California Environmental Reporting System (CERS) data for turpentine to characterize the chemical’s use in California workplaces as requested by HEAC.

Recommendations of new or unappreciated workplace chemicals for HEAC consideration

- Identified chemicals that should be considered for new or more health-protective PELs through its review of recent toxicity literature and documents from authoritative bodies such as the National Toxicology Program.
- Identified three chemicals—1-bromopropane (1-BP), p-chloro-α,α,α-trifluorotoluene (PCBTF), and titanium dioxide (ultrafine particles)—with the potential for significant workplace exposure in California using CERS and recommended that HEAC prioritize them in rulemaking.
- Provided suggestions for the top 10 “Priority 1” chemicals for future HEAC review and development of new or revised PELs.
- Provided an overview of purchasing companies and 1-BP product purchase amounts reported to CDPH under SB 193 and summarized a data report in de-identified form to share with the committee.
Impact

HEAC PEL recommendations for benzophenone, turpentine, and sulfur dioxide are currently pending, subject to final review.

At the December 3, 2019 HEAC meeting, three of the seven chemicals HESIS recommended for rulemaking—1-bromopropane (1-BP), p-chloro-α,α,α-trifluorotoluene (PCBTF), and titanium dioxide (TiO₂, ultrafine)—were selected by HEAC as “Priority 1” chemicals for PEL review.

These chemicals all pose a significant health hazard to workers:

- **1-BP** is a solvent used in degreasing, spray adhesives, and aerosol solvents. 1-BP harms the reproductive and nervous systems, and evidence has emerged showing that it can also damage genes and cause cancer. The current Cal/OSHA PEL for 1-BP is not sufficiently health protective.

- **PCBTF** is a solvent used in autobody shops; in paints and coatings; as an “intermediate” in the synthesis of dyes, pharmaceuticals, and pesticides; and in liquid electrical insulators in high-voltage applications, such as transformers, capacitors, and high-voltage cables. It causes cancer of the lungs, liver, kidney, uterus, and thyroid gland. Cal/OSHA currently has no PEL for PCBTF.

- **Titanium dioxide** in its ultrafine form is a powder used in many commercial products, including paints and varnishes, cosmetics, plastics, paper, and food as an anticaking or whitening agent. The current Cal/OSHA PELs that apply are not specific to titanium dioxide (they pertain to particulates not otherwise regulated) and are not expected to be protective against lung cancer.

HESIS’s unique scientific research and technical support enable Cal/OSHA to promulgate and enforce exposure limits on the use of harmful workplace chemicals that are based on the latest science.
FULFILLING OUR MISSION: RESPONDING TO COVID-19 IN THE WORKPLACE

The Need

The COVID-19 pandemic affects workplaces across California, including millions of essential workers in a range of industries. Employers and workers need guidance on how to prevent and respond to COVID-19 transmission in the workplace; local health departments need assistance with managing complex workplace outbreaks; Cal/OSHA needs public health input on industry guidance and regulation; and the CDPH and other state agencies need input on protecting their own employees, other workers, and the public.

What HESIS did in 2019–2020

Communicated

• Responded to inquiries from employers and workers.
• Solicited input from labor representatives and worker advocacy groups about their information and prevention needs.
• Developed informational materials and guidance for preventing the spread of COVID-19 in the workplace for a variety of audiences.
• Created a website focused exclusively on COVID-19 in the workplace.

Shared expertise

• Provided technical assistance to the CDPH, local health departments, and other agencies in planning for and responding to the pandemic, including workplace outbreaks.
• Collaborated with the Governor’s Office, Cal/OSHA, and other CDPH programs on industry-specific guidance documents.
• Provided input to Cal/OSHA on other communications, policies, and regulation.
• Served as subject matter experts on respiratory protection for the CDPH, many stakeholders, and the state stockpile of personal protective equipment (PPE).
• Advised the state COVID-19 vaccine allocation committee on occupational exposure and distribution issues.
FULFILLING OUR MISSION: RESPONDING TO COVID-19 IN THE WORKPLACE

Investigated

• Collaborated with other states and with NIOSH to develop and implement a survey of workers tested for COVID-19.

• Conducted “fit testing” to evaluate how well newly approved N95 filtering facepiece respirators fit the wearers.

• Examined patterns of industry and occupation among working-age Californians who died of COVID-19.

Protected

• Developed CDPH PPE specifications, prepared instructions for PPE validation, and evaluated hundreds of PPE items for inclusion in the state stockpile for healthcare facilities and emergency responders.

• Established a safety office in the CDPH Medical & Health Coordination Center (MHCC) to address the health and safety needs of CDPH COVID-19 responders.

• Played a pivotal role in the CDPH Health and Safety Workgroup that recommended PPE and developed and implemented a respiratory protection program for hundreds of CDPH investigators and field staff.

• Partnered with other CDPH programs, industry representatives, and program administrators to develop and deliver webinars and hands-on training on respirator programs for long-term care facilities, dental offices, and others.
FULFILLING OUR MISSION: RESPONDING TO COVID-19 IN THE WORKPLACE

Impact

- Contributed to dozens of guidance documents related to COVID-19 and the workplace.
- Assisted local health departments, the Department of Corrections and Rehabilitation, the Department of Food and Agriculture, and others in controlling workplace outbreaks of COVID-19 in agriculture, food processing, prisons, grocery stores, warehouses, and other settings.
- Provided input and technical support to Cal/OSHA’s newly approved COVID-19 Emergency Temporary Standards.
- Interviewed over 50 workers with and without COVID-19 to understand potential workplace contributors to infection.
- Helped to ensure that the California stockpile of N95 respirators and other PPE will provide reliable protection for thousands of healthcare workers and emergency responders.
- Documented the excess COVID-19 fatalities among working-age Latinos in physical service occupations, which will inform and enhance prevention efforts for these workers.
- Provided resources to long-term care facilities, dental offices, and CDPH programs to help improve respiratory protection for affected employees and prevent COVID-19 transmission on the job.
The Need

People who work outdoors, especially workers who dig or disturb soil, are at risk of becoming sick with Valley fever (also known as coccidioidomycosis or cocci), a potentially severe illness caused by the inhalation of spores of a fungus found in the soil in many areas of California. Valley fever cases in California continue to rise; in 2019 the state recorded the highest number since it began tracking cases in 1995. In addition, a new California law, AB 203 in 2019, required construction employers in counties with high rates of Valley fever to train their employees on minimizing the risk of Valley fever by May 1, 2020, and annually thereafter.

What HESIS did in 2019–2020

- In February 2020, HESIS developed the webinar Preventing Valley Fever in Outdoor Workers and partnered with a risk management group to present it to city and county government representatives planning construction projects or overseeing work that involves digging or disturbing soil, many of them in areas at high risk for Valley fever.

- Responding to the need for an easy-to-use guide for construction employers, supervisors, and trainers, HESIS created a new training resource, VALLEY FEVER: Tailgate Training Guide for California Construction Workers in English and Spanish. Cal/OSHA staff provided valuable technical feedback on the guide.

- HESIS staff worked closely with the CDPH Immunization Branch, Office of Public Affairs, and a media firm on a statewide public awareness campaign on Valley fever. The campaign created an award-winning video, workplace posters, and factsheets for workers and employers to help combat this hazard on the job.

- These workplace Valley fever materials were promoted in the OHB’s March 2020 and October 2020 Occupational Health Watch newsletters, which were sent to over 3,600 subscribers.

- In March 2020, HESIS staff gave a presentation, “Preventing Valley Fever in Construction Workers,” to the American Society of Safety Professionals at the 2020 Bay Area Safety Symposium held in San Ramon, CA.
FULFILLING OUR MISSION: INFORMATION OF PRACTICAL USE FOR PREVENTING VALLEY FEVER ON THE JOB

Impact

- 140 employers attended the February 2020 webinar for public employers; questions during the webinar and evaluation responses indicate that this experience will help them implement important Valley fever protections on the job.

- The February 2020 webinar slides were downloaded 649 times.

- Since March 2020, tailgate training guides have been downloaded 2,207 times, including 224 times in Spanish, enabling users to comply with AB 203 training requirements.

- OHB’s Preventing Work-Related Valley Fever web page, with a recent face lift to reflect the campaign, received thousands of visits (8,354 over a three-year period).

- Safety professionals who attended the HESIS presentation in San Ramon and downloaded the educational materials from our web page have the tools they need to develop their Codes of Safe Practice in order to prevent Valley fever in construction workers.
WHAT'S NEXT FOR HESIS?

Preventing COVID-19 infections on the job

HESIS will

- Continue to provide technical assistance to employers and local health departments on COVID-19 by promoting vaccination for at-risk workers and providing information on ways to avoid workplace exposure and respond appropriately to infections and outbreaks.

- Complete data collection and analysis for a NIOSH-sponsored multi-state callback survey of workers with COVID-19 to understand workplace contributors to infection, including a California-specific case-control study to compare the experiences of workers with and without COVID-19.

- Examine patterns of industry and occupation among Californians who died from COVID-19 to inform prevention efforts including vaccine allocation.

- Build out the OHB’s COVID-19 at the workplace website tools and develop a suite of informational materials for workers, including social media, animation, and other popular formats.

Preventing exposure to hazardous chemicals

HESIS will

- Provide research, technical assistance, and support to HEAC when it considers recommendations of new PELs for benzophenone and PCBTF and revised PELs for turpentine, sulfur dioxide, 1-bromopropane, and titanium dioxide (ultrafine).

Select a new workplace chemical to focus on for SB 193 safer alternatives activities. Obtain customer lists from suppliers to identify companies using the chemical, evaluate which industries have the greatest exposure, and work with employers in these industries to identify safer alternative products or processes.

In collaboration with colleagues from Cal EPA’s Office of Environmental Health Hazard Assessment (OEHHA), identify chemicals used in the workplace that are listed as causing cancer or reproductive and/or developmental toxicity under Proposition 65 and develop educational outreach and information about these chemicals.
Protecting workers from biological and other hazards

HESIS will

- Continue to provide technical support to Cal/OSHA for rulemaking on antineoplastic drugs administered in the workplace, surgical plume and smoke, and the permanent standard on wildfire smoke.

- Continue NIOSH-sponsored collaboration with the California Cancer Registry for rapid identification and outreach to newly diagnosed mesothelioma patients. The goals are to provide patients with resources about care and clinical trials, and to collect information from patients about asbestos exposures to inform prevention.

- Promote Valley fever prevention by disseminating our new training and education materials and possibly provide technical assistance or training of trainers.

- Assess the possibility of using inspection files from Cal/OSHA’s Special Emphasis Program on silica to describe exposures in California’s countertop fabrication industry.
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