Hazard Evaluation System
and Information Service

Annual Report

November 1, 2016 – October 31, 2017

A Report to the California Legislature Submitted to the Department of Industrial Relations for the Hazard Evaluation System and Information Service

September 2018
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As mandated by Labor Code section 147.2, this report details the implementation and operation of 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.” “Repository” refers to the program established in 1978 and now known as the Hazard Evaluation System and Information Service (HESIS). 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).

In 2016-2017, HESIS continued to implement its mandate to protect California workers from occupational illness. HESIS identified, evaluated, and provided practical information on toxic chemicals and other workplace hazards; assisted the DIR’s Division of Occupational Safety and Health (Cal/OSHA) in promulgating protective occupational health standards; and initiated and worked collaboratively with others on targeted public health projects and activities.

Specifically, HESIS implemented the mandates of the Labor Code by providing:

- a telephone information service for individuals seeking information about workplace hazards;
- educational materials, outreach, and education;
- evaluation of workplace hazards;
- technical support and consultation regarding occupational health to DIR, other programs within CDPH, other agencies, and private organizations;
- technical input and recommendations on standards setting; and
- rapid access to electronic databases and full-text articles through CDPH’s contract with the Public Health Library of the University of California, Berkeley.

Selected accomplishments of HESIS during this period include the following:

- HESIS began to implement its legislative authority for the chemical 1-bromopropane (1-BP), a solvent used in degreasing and spray adhesives. 1-BP is a known reproductive and developmental toxicant and neurotoxicant, and has been added to the California Proposition 65 list as a carcinogen. In this effort, HESIS:
  - disseminated its revised health hazard alert on 1-BP;
  - identified distributors and companies using the chemical;
identified quantities used;
reviewed safety data sheets (SDSs) for 1-BP-containing products; and
began to identify alternative substances.

Future work may include selected worksite visits, interviews, workshops, or other activities to inform development of new or revised educational materials on 1-BP for workers and employers.

- HESIS provided support to Cal/OSHA as it reinitiated the Health Effects Advisory Committee (HEAC) to advise Cal/OSHA on permissible exposure limits (PELs) for chemical substances in the workplace. HESIS reviewed the literature on exposure and toxicity of hazardous chemicals in preparation for establishing and revising regulatory exposure limits, shared relevant research, and assisted in preparing toxicology summary documents, including PEL recommendations for discussion in HEAC meetings. HESIS also collected and summarized use data for several chemicals and provided suggestions to revise HEAC’s chemical prioritization concept scheme, used to update the priority chemical list.

- HESIS responded to 68 calls to the Workplace Hazard Helpline (also referred to as the Telephone Response System or TRS). Of these calls, 78 percent were initiated by workers, relatives of workers, employers, health care providers treating workers, or industrial hygiene/safety personnel. In addition, HESIS responded to 31 requests for technical assistance from other stakeholders, including other branches of CDHP; Cal/OSHA’s Director’s Office, Enforcement Branch, and Research and Standards Unit; the Center for Environmental Health; and county health departments.

- HESIS conducted several collaborative public health activities, including the following:
  - **Wildfire smoke.** In October 2017, through conference calls with CDPH’s director and Office of Public Affairs (OPA), Cal/OSHA, and local health departments, HESIS collaborated with CDPH to develop consistent guidance on use of N95 respirators by workers and the public for protection from wildfire smoke and ash.
  - **Hepatitis A.** Also in fall of 2017, CDPH’s Medical and Health Coordination Center (MHCC) was activated to address several outbreaks of Hepatitis A. Three OHB staff members, including one HESIS member, participated in the response. At the request of the MHCC sciences branch director, HESIS reviewed and summarized existing guidance and scientific literature on preventing the spread of hepatitis A, identifying well-supported guidelines for disinfecting contaminated surfaces.
Coccidioidomycosis (Valley fever). HESIS continued to raise awareness about this workplace hazard and expanded relationships with other entities working on the topic. HESIS worked with local health departments in conducting investigations of occupational outbreaks and in promoting its Valley fever fact sheet. HESIS also updated its online coccidioidomycosis curriculum for health care providers.

- HESIS evaluated the health hazards of specific work-related exposures and provided technical assistance to numerous agencies and groups.
- HESIS reviewed occupational health literature, identified new and under-appreciated hazards, and expanded its collection of literature to support possible future recommendations on educational materials or standards. For example, HESIS reviewed the scientific literature and prepared health effects summaries on 1,2,3-trichloropropane (TCP), parachlorobenzotrifluoride (PCBTF), and isoflurane.
- HESIS showcased its publications and other resources on the OHB website and using other information dissemination methods, including OHB’s electronic newsletter and the communication tools of partner organizations.

This report furnishes additional detail on HESIS activities, including:

- identifying the toxic materials, harmful physical agents, and other workplace hazards investigated during the past year and making recommendations concerning them;
- describing actions taken to inform interested persons of hazards of exposure to toxic materials and harmful physical agents;
- recommending legislative changes relating to HESIS functions; and
- specifying the amounts and sources of funds allocated.
Labor Code Section 147.2 Mandate 1

Provide reliable information of practical use to employers, employees, representatives of employees, and other governmental agencies on the possible hazards to employees of exposure to toxic materials or harmful physical agents.

1. Workplace Hazard Helpline / Telephone Response System

HESIS’s telephone response system (TRS) logged a total of 68 calls from November 2016 through October 2017. A TRS response generally involved one to three telephone interactions with the caller, as well as substantial online technical data retrieval, determination of appropriate referral avenues, and provision of supporting documentation, either as online links or in hard copy. This year, a federal Centers for Disease Control (CDC) Epidemic Intelligence Service officer placed at OHB supplemented HESIS staff and worked under their mentorship to assist with TRS response, gaining experience in addressing the questions and concerns raised by callers. This year, HESIS counted only inquiries that came through TRS. Those from other sources, such as referral or in-person communication with HESIS staff, are enumerated separately to better characterize the use of the helpline. Inquiries and requests for HESIS assistance by other routes are discussed below under “Technical Assistance for Cal/OSHA and Selected Other Constituencies.”

Call volume. Monthly calls ranged from two to eight, led by February, March, and April 2017.

Figure 1. Number of TRS Calls per Month. (n=68)
Type of caller. Most inquiries came from employees and their relatives, followed by “other,” state or local health agencies, industrial hygiene/safety personnel, employers, health care providers, and Cal/OSHA staff. Examples of “other” callers include private individuals, professional school representatives, and worker advocacy groups.

Hazardous agent of concern. The hazardous agents about which callers inquired were principally biological (e.g., bloodborne pathogens, aerosol transmissible diseases, mold, or coccidioidomycosis) or chemical (e.g., formaldehyde, methylene chloride, or epoxy resins), followed in frequency by physical agents (e.g., heat or physical injuries) and “other” work-related issues.
Primary inquiry. The most common type of question concerned ways to control workplace hazards or general workplace information, followed in frequency by questions regarding workplace exposures (e.g., what chemicals a worker might be exposed to and to what extent), “other” questions (e.g., regulatory information, referral to worker advocates or workers’ compensation resources, or medical surveillance), questions regarding the toxicity of specific chemicals, questions about the relationship of symptoms to work exposures, and questions about pregnancy risks. Examples of “general information” include inquiries regarding workplace policies or discrimination issues, workplace sanitation, developing injury and illness prevention, hazard communication, and respiratory protection programs.

Examples. The following descriptions represent typical 2016-2017 TRS calls:

- A dispatcher working for a city police department inquired about antimicrobial cleaning products for flat surfaces and computer hardware that were not associated with respiratory symptoms. HESIS provided information on green cleaning products, including resources from the federal Environmental Protection Agency (EPA) and San Francisco Asthma Task Force, among others. HESIS also identified cleaning agents to avoid due to associated asthma and other respiratory impacts.

- A nurse working for a temporary employment agency inquired about the safety of mixing chemotherapy during pregnancy. HESIS provided various resources to the worker about protections for temporary workers, the Pregnancy Discrimination Act, personal protective equipment and other safety measures, and medical monitoring. HESIS also provided guidance to the obstetric care
provider, including worker accommodation options, references on workplace reproductive policies, and assessment, including limitations, of exposure controls for hazardous drugs.

- A laboratory research assistant inquired about neurologic symptoms associated with isoflurane exposure during animal microsurgeries. HESIS provided guidance on potential health effects associated with isoflurane exposure, exposure control measures, and workers’ compensation and occupational medicine resources.

- A trainer at the federal Occupational Safety and Health Administration (OSHA) requested guidance on whether California hotels, casinos, and entertainment places must use EPA-approved disinfectants when cleaning up blood or other potentially infectious material. HESIS reviewed the bloodborne pathogens standard and provided a summary of the scope of the standard coverage and types of disinfectants required.

- A former employee who had fed and bred rats requested guidance about past exposure to Seoul virus. HESIS consulted Seoul virus experts at CDC Control and Prevention, the CDPH Viral and Rickettsial Disease Laboratory Branch, and the CDPH Veterinary Public Health Section to provide materials and communicate information about exposure risk.

- A paint manufacturing worker called with questions about skin rashes and neurological symptoms which he believed were caused by exposure to epoxy resins and solvents. HESIS provided information about the potential adverse effects of these chemicals and referred the caller to occupational medicine clinics in California for medical consultation, as requested.

- A clinic staff member called on behalf of her pregnant patient who was potentially exposed to spray cleaning products containing chemicals including dimethyl benzyl ammonium chloride, dimethyl ethyl benzyl ammonium chloride, and ethyl alcohol. HESIS reviewed and provided current information on adverse health effects from exposure to these chemicals and provided links to additional resources.

- A worker requested information on potential exposures and health effects of residual solvents such as n-methylpyrrolidone, ethyl benzene, and titanium dioxide from paint products long after their application. HESIS staff procured the SDSs and reviewed the chemicals’ toxicities to provide the worker with information on human health effects.

- An office staff person working in a metal shop called with concerns about potential adverse effects for pregnant women of exposure to solvent sprays used in the vicinity of her office. HESIS reviewed the adverse health effects of chemicals contained in the products and provided this information to the caller.
Electronic TRS database. HESIS’ searchable database of TRS calls uses EpilInfo software and is routinely employed by staff responding to information requests.

TRS intranet site. HESIS uses a CDPH Information Technology Services SharePoint utility to maintain an intranet site for use by TRS responders within OHB. The site includes commonly consulted documents, useful website URLs, agency contacts, and other resources. Responding to TRS calls, with training and oversight by HESIS staff, provides valuable experience to trainees, fellows, students, and other OHB staff.

2. Development of Educational Materials

In 2016-2017, HESIS completed or worked on the following educational materials:

- **Respirator use guidance.** In collaboration with CDPH, HESIS developed consistent guidance on use of N95 respirators by workers and the public for protection from wildfire smoke and ash.
  - Fact sheet: [Use of Particulate Respirators (Masks) to Protect from Wildfire Smoke or Ash](#)
  - Webpage: [Be Informed – Wildfire FAQs](#)

- **Preventing Work-related Valley Fever in Wildland Firefighters Tailgate Training.** In collaboration with CDPH’s Infections Diseases Branch (IDB), the California Department of Corrections and Rehabilitation (CDCR), and the California Department of Forestry and Fire Protection (CAL FIRE), HESIS prepared a fact sheet for inmate firefighters on minimizing exposure to Valley fever while fighting wildland fires.

- **1-Bromopropane (n-Propyl Bromide) Health Hazard Alert.** HESIS completed a major revision of this alert, which incorporates significant new scientific findings on the health hazards of 1-BP and its use in workplaces in California.

- **Other publication updates.** HESIS reviewed all of its chemical substance publications and prioritized six for updating based on the availability of new information since their publication dates. Among these, HESIS plans to update the trichloroethylene fact sheet first due to concerns about the substance’s cancer and reproductive hazards, current usage, and potential occupational exposure, as well as to other criteria.

- **Fact sheet on isoflurane use in veterinary hospitals.** HESIS continued work on a new fact sheet on isoflurane, an anesthetic gas used by veterinarians and veterinary technicians. Work was initiated in this area after HESIS received inquiries from employees regarding possible exposure in veterinary hospitals. In response, HESIS staff conducted a literature review that, along with industry stakeholder interviews done previously, is informing development of the fact sheet on potential health effects and minimizing exposure. The fact sheet is close
to completion, and HESIS is developing a plan for dissemination through stakeholders who contributed to the content.

3. Dissemination of Educational Materials

**Telephone.** During the report period, HESIS distributed hard copies of its publications by mail to TRS callers to supplement and reinforce information provided by telephone. Publications were also mailed in response to direct telephone requests.

**Cal/OSHA and other organizations.** HESIS continued to mail its publications to the Cal/OSHA district and area offices for dissemination by the Enforcement and Consultation Branches and to serve as resources for telephone consultations. Other organizations that requested and disseminated HESIS publications include the following:

- Labor Occupational Safety and Health Program, University of California, Los Angeles
- Los Angeles County Department of Public Health
- California Department of Food and Agriculture
- California Department of Toxic Substances Control
- State Compensation Insurance Fund
- National Clearinghouse for Worker Safety and Health Training, National Institutes of Health

**Workplace posters.** HESIS obtained funding from OPA to print 4,100 copies of the bilingual (English/Spanish) occupational Valley fever poster. HESIS is collaborating with IDB in disseminating the poster, along with IDB multilingual posters on Valley fever, to the general public, local health departments, and others who can use them. In the near future, HESIS, OHB, and IDB will develop a plan for broader dissemination in endemic areas.

**Conferences and meetings.** HESIS distributed its publications at formal conferences and meetings, including the following:

- Workers’ Memorial Day Event, Oakland
- Association of Orthopaedic Technologists California Symposium
- American Industrial Hygiene Association, Northern California Association Symposium
- Cal/OSHA Advisory Committee Meeting, Oakland
- Senior Industrial Hygienist Technical Meetings
• International Coccidioidomycosis Symposium, Stanford
• Continuing Challenge HazMat Emergency Response Workshop, Sacramento
• Urban Shield First Responder Exercise, Pleasanton

On line. In 2016-2017, HESIS continued to use the websites of CDPH and the National Institute for Occupational Safety and Health (NIOSH) to disseminate its educational materials.

On April 1, 2017, CDPH launched a redesigned website, disabling the old site on October 6, 2017. Enhanced features of the new site include more pictures, updated format and functionality, and webpages and documents compliant with the Americans with Disabilities Act (ADA).

HESIS participation in this effort included (a) redesigning HESIS webpage content and posting it in the new format; (b) manually converting over 65 of its publications to an ADA-compliant format, updating their content where necessary, and posting them on the HESIS publications page; (c) participating in the redesign of Occupational Health Branch web content, including creation of full-content indices to make program material easier to find; and (d) troubleshooting, posting, and making website corrections for the other six OHB programs.

During the 11 month period prior to the October web migration, the site facilitated close to 170,000 unique downloads of HESIS publications. Together, the top 10 HESIS publications downloaded or viewed during the report period represented approximately 58 percent of all unique downloads. Listed in order of demand volume, these publications are:

1. Understanding Toxic Substances
2. If I’m Pregnant, Can the Chemicals I Work with Harm My Baby?
3. Epoxy Resin Systems Fact Sheet
4. Formaldehyde Fact Sheet
5. Isocyanates: Working Safely Fact Sheet
6. Methyl Methacrylate (MMA) Fact Sheet
7. Methylene Chloride Fact Sheet
8. Glycol Ethers Fact Sheet
9. N-Methylpyrrolidone (NMP) Health Hazard Advisory
10. Methylene Chloride (Dichloromethane) Occupational Health Hazard Alert

In addition to disseminating its educational materials, HESIS provides other health and safety resources, promotes its activities, and shares other information of interest to
stakeholders on its web pages. During the same 11-month period, close to 89,000 unique visitors accessed HESIS web pages.

HESIS also circulates over 60 of its online educational publications through a searchable website created by NIOSH. The State-based Occupational Health Surveillance Clearinghouse is a centralized online library with publications from occupational public health programs in 25 states. The Clearinghouse contains thousands of educational tools, data and case reports, studies, investigations, and articles, including approximately 800 from California’s OHB. During the report period, HESIS revised seven XML files for Clearinghouse listing.

E-newsletter. HESIS publicized the major revisions of its 1-BP Health Hazard Alert through the March 2017 issue of the OHB electronic newsletter Occupational Health Watch (e-OHW). This issue, entitled “Cancer Added to 1-Bromopropane Health Concerns,” was circulated to 3,900 recipients.

HESIS promoted Valley Fever Awareness Month by dedicating the July 2017 issue of e-OHW to the topic. “Valley Fever Awareness Month: Outdoor Workers at Risk” was circulated to 4,670 recipients. Also in this issue, HESIS publicized its updated online continuing education curriculum on coccidioidomycosis for health care providers.

4. Presentations and Scientific Publications

HESIS and OHB presentations about HESIS

Barbara Materna, PhD, CIH, OHB Chief


Saeher Muzaffar, MD, MS, MPH, HESIS Chief

- “LTBI Testing in Health Care Workers,” CDPH Tuberculosis Control Branch (TBCB), Richmond, April 14, 2017. Evidence-based discussion of the rationale for periodic screening of health care workers for latent tuberculosis infection (LTBI).


Jennifer McNary, HESIS Research Scientist


Public health and scientific journal publications


Sondermeyer Cooksey GL, Materna BL. Update on Coccidioidomycosis in California. Medical Board of California Newsletter 2017;141:20-21. (Highlights HESIS’ continuing medical education course on coccidioidomycosis occupational health issues.)

5. Addressing New and Underappreciated Workplace Hazards through Collaboration and Stakeholder Outreach

Avian influenza in poultry workers. HESIS’ industrial hygienist attended a regional workshop of the California Department of Food and Agriculture on avian influenza (AI) preparedness. Workshop participants were federal, state, local, and industry stakeholders expected to respond to a future highly pathogenic AI outbreak in California. Participants discussed response procedures and had the opportunity to clarify their roles.

With the CDPH Immunization Branch and public health veterinarian, HESIS sent a letter to poultry and egg producers in California encouraging vaccination of their employees for seasonal influenza. Poultry workers should receive the influenza vaccine each fall to reduce the possibility of dual infection with avian and human influenza A viruses, which could result in the formation and spread of new influenza viruses for which humans have no immunity.

Ebola virus disease. Beginning fall 2014 and continuing into 2017, HESIS participated with the CDPH Center for Health Care Quality on a multi-disciplinary team that surveyed hospitals to assess their preparedness to receive patients with highly infectious diseases such as ebola virus disease. In 2017, HESIS contributed to a report with recommendations for one hospital.

Occupational health disparities. HESIS continued its efforts to address occupational health disparities and explore potential areas of collaboration with the CDPH Chronic Disease Control Branch and the Policy Unit of CDPH’s Office of Health Equity (OHE). At a follow-up meeting with OHE in December 2016, plans for ongoing information exchange of relevant data and resources were discussed.
Safety and health training. HESIS’ health education consultant served on the Advisory Board of the Worker Occupational Safety and Health Training and Education Program.

Young worker health and safety. HESIS’ health education consultant served on the Advisory Board of the California Partnership for Young Worker Health and Safety and also participated in the Young Worker Policy Initiative workgroup. HESIS and OHB promoted partnership activities such as Safe Jobs for Youth Month and provided input into the development and evaluation of educational and outreach efforts.

Collaboration with the University of California. HESIS maintained regular contact with the Labor Occupational Health Program at UC Berkeley and the Labor Occupational Safety and Health Program at UCLA to stay apprised of their projects, share resources, and explore collaboration opportunities.

Worksafe. HESIS met periodically with Worksafe staff to discuss relevant HESIS projects and areas for future collaboration to prevent work-related illness among vulnerable workers exposed to chemical and other hazards.

6. Technical Assistance for Cal/OSHA and Selected Other Constituencies

Technical assistance provided to Cal/OSHA


Facilitating collaboration. During the report period, HESIS created and maintained a SharePoint site for communicating efficiently and sharing documents and references with Cal/OSHA’s Research and Standards Unit.

Research. HESIS assisted Cal/OSHA with research on the following topics:

- At the request of an Enforcement Branch senior safety engineer, HESIS identified guidance from authoritative sources on controlling exposure to Q fever, a zoonotic disease, at a rendering plant. HESIS also provided an article from the federal OSHA Training Institute on necessary training elements for staff at a slaughter facility.

- At Cal/OSHA’s request, HESIS prepared an annotated bibliography on the hazards and effectiveness of control measures for surgical smoke.

- HESIS updated a bibliography on lead for the Lead Standards Advisory Committee.

- Anticipating Cal/OSHA’s need for assistance in developing educational materials for hotel employers in response to new Title 8 section 3345, HESIS participated in a Hotel and Housekeepers Advisory Committee meeting.
• HESIS responded to 19 technical inquiries from the Research and Standards Unit.

Technical assistance provided to selected other constituencies

State Government

• **Tuberculosis (TB).** HESIS' public health medical officer (PHMO) and industrial hygienist participated in discussions with Cal/OSHA, TBCB, and CDCR about LTBI testing for inmates. The PHMO also prepared a summary of occupational health concerns regarding a petition to amend the LTBI screening requirements of Cal/OSHA’s Aerosol Transmissible Diseases Standard.

• **Wildfire smoke.** During the wildfires of fall 2017, HESIS assisted in developing guidance and answered specific questions regarding health hazards from inhaling smoke and how to avoid exposure. HESIS provided guidance to a major workers’ compensation insurance carrier on respirator use for workers with smoke exposure. HESIS’ industrial hygienist participated in a conference call led by the CDPH public information officer regarding use of N95 respirators for the public.

In addition, OHB Chief Barbara Materna assisted with the emergency response of MHCC by writing guidance regarding distribution to state and local agencies of respirators from the national stockpile, “Priority Groups for Distribution of Particulate Respirators to Protect from Wildfire Smoke.” Dr. Materna also reviewed press release language on N95 respirators, prepared talking points, and briefed the CDPH director and Cal/OSHA chief on using respirators to protect the public and workers from wildfire smoke and ash.

• **Opioids.** HESIS met a request from a chemical threat response coordinator for educational materials for emergency responders exposed to opiates in the course of their duties. HESIS contacted subject matter experts and identified guidance to provide to the requestor, including information on the ability of these chemicals to enter the body and effective protective equipment.

• **Hepatitis A.** In fall 2017, MHCC was activated due to several outbreaks of Hepatitis A in which 21 California residents died. Three OHB staff members, including one from HESIS, participated in the response. At the request of the MHCC Sciences Branch director, HESIS summarized the existing guidance and scientific literature on preventing the spread of hepatitis A and identified well-supported guidelines for disinfecting contaminated surfaces.

• **Duty officer service.** HESIS staff served as duty officers for CDPH for questions about emergency response to hazardous chemical exposure, providing subject matter expertise for a variety of environmental and occupational incidents.
Local Government

- **PCBTF.** At the request of the San Francisco Department of Public Health, HESIS prepared a toxicity summary of recent scientific literature on p-chloro-α,α,α-trifluorotoluene, also known as parachlorobenzotrifluoride or PCBTF, a volatile organic compound (VOC)-exempt solvent used in auto body shops.

- **Needlestick injuries.** At the request of a local health officer, HESIS provided information on how to get the infectious disease status of a source patient from a hospital in the event of an occupational needlestick injury.

Labor Representatives/Advocates

- **Oil field wastewater.** HESIS provided information to the Center for Environmental Health (CEH) regarding chemicals in produced water (oil field wastewater) used for irrigation and discussed sources of information for farmworkers regarding their potential exposure.

- **Dimethyl sulfoxide.** HESIS prepared a toxicity summary of recent scientific literature on dimethyl sulfoxide, a component in paint strippers, for the Institute for Research and Technical Assistance.

Labor Code Section 147.2 Mandate 2

Collect and evaluate toxicological and epidemiological data and any other information that may be pertinent to establishing harmful effects on health of exposure to toxic materials or harmful physical agents.

1. Selected Hazard Evaluations

**TB risk among health care workers.** The HESIS chief informed TBCB about epidemiologic literature on TB risk for health care workers as compared to other workers and in low TB incidence areas. (Also see Mandate 1.)

**Health effects from produced water.** HESIS reviewed the literature and met with CEH’s Healthy Energy Program regarding the risks to workers who handle or are exposed to produced water for agricultural irrigation in California’s Central Valley.

**Occupational exposure to anesthetic gas.** In response to several helpline calls, HESIS studied epidemiologic and toxicologic data regarding short- and long-term health effects of occupational exposure to isoflurane, including review of genotoxicity, reproductive toxicity, and neurotoxicity. (Also see Mandate 1.)
Occupational exposure to PCBTTF. In response to an inquiry from the San Francisco Department of Public Health, HESIS studied the toxicity and statewide use of PCBTTF to determine whether the chemical was an occupational hazard.

Occupational exposure to TCP. HESIS investigated the cancer risk associated with inhalation of the chemical TCP, as well as its potential for exposing workers to unpolymerized residue, and prepared a toxicity summary. (Also see Mandate 4.)

2. Information Repository

HESIS Electronic Repository of Occupational Health Information

In collaboration with the UC Berkeley Public Health Library, HESIS continued electronic document delivery to Cal/OSHA’s Research and Standards Unit and expanded services to its Medical Unit. For these units, HESIS prepared annotated bibliographies in support of the lead standard revision and a new advisory committee on surgical smoke.

HESIS continued to review table-of-contents alerts in toxicology, industrial hygiene, and occupational medicine journals, as well as evidence-based reports from sources such as national professional societies. HESIS also followed the activities of authoritative agencies to identify emerging hazards and issues. These agencies included NIOSH and EPA, as well as the California Office of Environmental Health Hazard Assessment (OEHHA), International Agency for Research on Cancer, National Toxicology Program, and European Chemicals Agency.

HESIS assimilated this research by cataloging key articles in its electronic repository.

Labor Code Section 147.2 Mandate 3

Chemical manufacturers, formulators, suppliers, distributors, importers, and their agents shall provide to HESIS the names and addresses of their customers who have purchased certain chemicals, or commercial products containing those chemicals, when HESIS, in consultation with DIR, determines that a substance, which may be in use in a place of employment, may pose a hazard under a reasonable anticipated condition of use, and potentially poses a serious new or unrecognized health hazard to an employee.

Chapter 830, Statutes of 2014 (SB 193 – Monning), added this HESIS authority and mandate, effective January 1, 2016. The intent of the bill was to enable HESIS to provide critical hazard information directly to California employers and to workers potentially exposed to chemicals of concern, and to support HESIS investigations
evaluating the extent of particular hazards. The legislation authorizes HESIS to obtain contact information from manufacturers and suppliers of a particular chemical or product of concern for California workplaces.

In November 2016, HESIS implemented its authority under SB 193 for the chemical 1-bromopropane (1-BP), a solvent used in degreasing and spray adhesives. A known reproductive/developmental toxicant and neurotoxicant, 1-BP was added to the California Proposition 65 carcinogen list. Adverse outcomes such as neurotoxicity may occur at levels lower than previously appreciated. The current PEL of five parts per million was based on reproductive/developmental outcomes and may no longer be sufficiently protective for cancer and non-cancer endpoints.

In support of this effort, HESIS prepared the following documents:

- 1-BP rationale summary
- 1-BP background
- Letter to manufacturers of 1-BP-containing products
- Sample product list
- Sample spreadsheet for reporting customers to CDPH
- Revised 1-BP health hazard alert

These documents were reviewed and approved by CDPH management and shared with the director of DIR.

HESIS developed a list of degreasers and spray adhesives sold in California that contained 1-BP and identified their manufacturers. In September 2017, HESIS mailed the updated 1-BP hazard alert with a letter to 36 product manufacturers requesting product SDSs and customer information, including names, addresses, quantities purchased, and dates of shipment during the preceding twelve months.

As of October 31, 2017, response numbers were as follows:

- Nineteen manufacturers provided customer lists.
- Nine manufacturers reported no sales of products containing 1-BP in California in the 12-month period prior to the date of the letter.
- HESIS received 56 SDSs for products containing 1-BP.
- Five companies provided a total of 12 SDSs for alternate, non-1-BP products.
- 225 unique California customers were reported, including a few distributors.
- A wide range of quantities sold were reported, from a few 12-ounce aerosol cans to 3,010 pounds per shipment.
HESIS is preparing to send these customers the hazard alert and an invitation to work with HESIS to elucidate work processes involving 1-BP and identify resources that could prevent exposure. HESIS seeks to conduct selected worksite visits, interviews, workshops, or other activities to inform development of a worker training guide on use of 1-BP, new or revised educational materials for workers and employers, and/or a guidance document on exposure control tailored to each industry using the chemical. Such interventions would include information on safer alternatives to 1-BP, as well as engineering, work practice, personal protective equipment, and other controls known to reduce exposure.

In addition, HESIS developed a template for reviewing SDSs received for accuracy of hazard information and plans to contact manufacturers whose SDSs require revision.

**Labor Code Section 147.2 Mandate 4**

**Recommend to the Chief of the Division of Occupational Safety and Health Administration that an occupational safety and health standard be developed whenever it has been determined that a substance in use or potentially in use in places of employment is potentially toxic at the concentrations or under the conditions used.**

1. **Support for Cal/OSHA Health Effects Advisory Committee**

   **Development of Permissible Exposure Limits under California Code of Regulations Title 8, Section 5155**

   Support for HEAC. HESIS’ toxicologist and PHMO attended all HEAC meetings about replacing or revising regulatory exposure limits and provided support to the Cal/OSHA toxicologist in reviewing literature on exposure and toxicity of hazardous chemicals. Support provided included the following:

   - Researching literature on aluminum, hydrogen sulfide, manganese, TCP, peracetic acid, 2-butoxyethyl acetate, 2-butoxy ethanol, methyl isobutyl ketone, tert-butyl acetate (all isomers), sulfur dioxide, and acetone
   - Reviewing the results to identify relevant articles
   - Sharing relevant articles with Cal/OSHA and preparing toxicology summaries, including PEL recommendations, for discussion in HEAC meetings
   - Providing additional recommendations for most of these chemicals with updated “authoritative body” listing data, reference exposure levels, and occupational
exposure limits (Authoritative bodies are government agencies that characterize the toxicities of chemical substances and publish this information via reports, regulations, and monographs. They include NIOSH, the U.S. EPA, the National Toxicology Program (NTP), the International Agency for Research on Cancer, the Agency for Toxic Substances and Disease Registry, the European Chemicals Agency (ECHA), federal OSHA, and Cal/EPA’s OEHHA.)

- Recommending revision of PELs for hydrogen sulfide, manganese, TCP, and methyl ethyl ketone
- Reviewing recent scientific literature on manganese toxicity and summarizing “Manganese homeostatic regulation and reproductive/developmental toxicity”
- Reviewing HEAC priority 1 and 2 chemicals for toxicity hazards, usage, and occupational exposure in California through the California Environmental Reporting System (CERS) and recommending upgrading the priority of some chemicals (e.g., perchloroethylene, benzophenone, and bisphenol A) for HEAC consideration
- Providing summaries of CERS data for several chemicals considered by HEAC, such as benzaldehyde, hexahydropthalic anhydride, monochloroacetic acid, tert-amyl methyl ether, TCP, and 1,1,2,2-tetrabromomethane, to assess potential occupational hazards
- Responding to 57 research requests by providing 87 peer-reviewed articles
- Suggesting revisions to HEAC’s chemical prioritization scheme, used to update the priority chemical list

**Recommendation to lower TCP PEL.** HESIS reviewed recent EPA and OEHHA risk assessments for TCP and recommended lowering the PEL based on cancer risk. HESIS also investigated usage and exposure potential by obtaining CERS data and speaking with manufacturing chemists in PPG Industries, Inc. (a maker of aerospace sealants), 3M Automotive and Aerospace Solutions Division, and laboratory industrial hygienists.

**Prioritization of workplace chemicals.** HESIS reviewed the workplace chemicals listed in Proposition 65 as known to cause reproductive or developmental toxicity or cancer and identified those that either lacked a Cal/OSHA PEL or had a PEL based on endpoints other than such toxicity or cancer. To provide protection against these health outcomes, HESIS is reviewing this shorter list of about 80 chemicals to identify their current usage and occupational exposure in California and prioritize them for consideration by Cal/OSHA for new or revised PELs. In the meantime, based on the high production/usage information reported under the Toxic Substances Control Act of 2012, HESIS recommended prioritizing 21 of these chemicals, most of which have been incorporated in the current HEAC chemical priority list.
2. Support for Other Cal/OSHA Standards Advisory Committees

HESIS staff participated in Cal/OSHA’s advisory committee meetings on housekeeping in the hotel and hospitality industry.

At the request of a member of Cal/OSHA’s Research and Standards Unit, HESIS researched airborne exposure monitoring results for lead. This information is being considered in the economic impact analysis of the revised Cal/OSHA lead regulations.

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**Labor Code Section 147.2 Mandate 5**

Notify the director of pesticide regulation of any information developed by HESIS that is relevant to carrying out his or her responsibilities under Chapters 2 (commencing with section 12751) and 3 (commencing with section 14001) of Division 7 of the Food and Agricultural Code.

There were no activities under this mandate during the report period.

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**Labor Code Section 147.2 Mandate 6**

Notify the secretary for environmental protection of any information developed by HESIS that is relevant to carrying out his or her responsibilities.

There were no activities under this mandate during the report period.

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**Labor Code Section 147.2 Mandate 7**

Assure the use and non-duplication of resources of other governmental agencies.
Cal/OSHA. HESIS continued routinely to meet with, confer with, and make referrals to Cal/OSHA and to use and disseminate Cal/OSHA educational materials.

The OHB chief and HESIS staff participated in quarterly meetings of the Cal/OSHA deputy chief for health, the program manager for communications and strategic planning, and staff of the Research and Standards Unit and the Medical Unit to discuss priorities and share updates on HESIS and Cal/OSHA activities.

HESIS’ industrial hygienist participated in Cal/OSHA statewide senior technical meetings held once every two months by video conference for staff industrial hygienists from the Medical Unit and headquarters. This forum provided an opportunity for information exchange and discussion regarding new regulations, enforcement initiatives and procedures, sampling protocols, laboratory issues, staffing changes, significant projects, and interesting case reports. At these meetings, HESIS staff discussed ongoing investigations and new or revised guidelines and fact sheets.

OHB’s chief and medical officers participated in monthly conference calls convened by Cal/OSHA’s Medical Unit to discuss emerging issues, medical aspects of proposed standards, and activities underway at each agency.

HESIS summarized the public health mandates serving as a basis for CDPH occupational health investigations of coccidioidomycosis (Valley fever) to assist the Cal/OSHA chief in delineating interagency working relationships.

CDPH. To evaluate and provide consultations regarding workplace hazards, HESIS routinely consults, makes referrals to, and uses materials and website information developed by numerous CDPH programs. In this report period, these programs included the Indoor Air Quality Section of the Environmental Health Laboratory Branch, the Environmental Health Investigations Branch, the Environmental Management Branch, the Radiologic Health Branch, the Vector-Borne Disease Section, IDB, TBCB, and the Immunization Branch.

California Environmental Protection Agency (CalEPA). HESIS provides consultation to OEHHA and the Office of Pollution Prevention and Technology Development, both agencies within CalEPA, citing technical information and other resources to recommend exposure prevention strategies to protect workers from adverse health effects of organic solvents and other hazardous substances.

NIOSH and federal OSHA. HESIS uses and disseminates NIOSH and OSHA publications and referred callers to the NIOSH and OSHA websites for additional resources. Conversely, HESIS promoted its own publications in the NIOSH-sponsored State-based Occupational Health Surveillance Clearinghouse. (Also see Mandate 1.)
**Labor Code Section 147.2 Mandate 8**

**Recommend legislative changes related to the functions of HESIS.**

No legislative changes in HESIS functions were proposed during the report period.

**Authorized HESIS Positions, 2016-2017**

**Permanent Positions**

- Public Health Medical Officer III  
  Saeher Muzaffar  
  100%
- Staff Toxicologist (Specialist)  
  Kashyap Thakore, PhD  
  100%
- Research Scientist III (Phys/Engr Sci)  
  Jennifer McNary, MPH, CIH  
  100%
- Health Education Consultant III  
  Mary Deems, MPH  
  100%
- Management Services Technician  
  Angela Williams-Bell  
  100%

**Source of Funding**

HESIS is supported through an interagency agreement between the Department of Industrial Relations, Cal/OSHA, and the Occupational Health Branch of the Department of Public Health.

**Annual Budget**

The HESIS budget follows the state fiscal year cycle. The budget for July 1, 2016, through June 30, 2017, was $1,016,093, and the budget for July 1, 2017, through June 30, 2018, was $1,058,316.
<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Definition</th>
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<tr>
<td>1-BP</td>
<td>1-bromopropane</td>
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<td>AI</td>
<td>Avian influenza</td>
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<td>CalEPA</td>
<td>California Environmental Protection Agency</td>
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<td>DIR Division of Occupational Safety and Health</td>
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<td>California Department of Public Health</td>
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<td>DIR</td>
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<tr>
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<td>U.S. Environmental Protection Agency</td>
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<td>LTBI</td>
<td>Latent tuberculosis infection</td>
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<td>CDPH Medical and Health Coordination Center</td>
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<td>MPH</td>
<td>Master of Public Health degree</td>
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<tr>
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<td>NIOSH</td>
<td>U.S. National Institute for Occupational Safety and Health</td>
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<td>CDPH Office of Public Affairs</td>
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<td>PCBTF</td>
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<td>Permissible exposure limit</td>
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<td>Public health medical officer</td>
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<td>Safety Data Sheets</td>
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<td>CDPH Tuberculosis Control Branch</td>
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<td>HESIS Telephone Response System</td>
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