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Health** reprint**Workplace Health Hazards:  
Analysis of Hotline Calls Over a Six-Year Period**

JULIA QUINT, PhD, MARGARET HANDLEY, BA, AND KATE CUMMINGS, MPH

**Abstract:** Between 1981–1986 a state-based occupational health telephone hotline received more than 8,000 inquiries on over 3,000 hazardous agents. Major caller groups were employees (37%), employers (20%), health care providers, primarily physicians (19%), government agencies (12%), and labor unions (6%). Employees were the fastest growing caller group. Callers inquired about general health hazards of chemicals (65%), the relation of symptoms to work (22%), and risks to pregnancy (13%). (*Am J Public Health* 1990; 80:202–204.)

*Introduction*

In 1979, the California legislature enacted a right-to-know law with several support resources including the Hazard Evaluation System and Information Service in the Department of Health Services. As described elsewhere,<sup>1</sup> staff (toxicologists, physicians, industrial hygienists) perform a variety of functions, including operation of a publicly accessible telephone inquiry response system. Over 12,000 inquiries involving a cross-section of California workplaces have been received from 1980 through early 1989.

We present and discuss descriptive statistics which characterize inquiries received from 1981 through 1986.

*Methods***Inquiry Intake Procedure**

Information in the following categories is obtained from callers and recorded on a standard form after assuring confidentiality. Callers' concerns are grouped into one of three areas: effect on pregnancy; relation of symptoms to work; general health hazard information. Only one concern is recorded as primary; the order of priority (highest to lowest) is pregnancy, symptoms, general information. Callers are categorized as follows:

- *Employees:* persons calling on their own behalf regarding exposures in their workplace, self-employed individuals, and friends and relatives who call on behalf of employees.
- *Employers:* supervisors and managers, company health and safety and medical personnel and industrial hygienists.
- *Health care providers:* physicians, nurses, genetics counselors, poison control center staff and paramedics.
- *Governmental representatives:* California Occupational Safety and Health Administration (OSHA) personnel, city, county, state and federal personnel.
- *Others:* attorneys, news media representatives, volunteer organizations, educational institutions, etc.

Callers' characteristics and primary concerns were tallied from 1981 through 1986. Primary concerns by caller group were tallied from 1986 logs. Data on employee industries, occupations and agents and repeat callers were tallied from the 4th quarter, 1986. Industry data were available for 466 of 562 total inquiries.

*Results*

During the first four years of full service, there was a modest increase in the annual volume but in 1985 and 1986, the number of inquiries increased by 49 percent and 43 percent, respectively (Figure 1). The average number of inquiries during 1985 and 1986 (2,067) was approximately double the average (1,038) during 1981–84. The sudden increase in inquiry volume appears to be due to increased awareness regarding the potential health effects of chemical exposures at work.

In 1986, of the 365 employer inquiries received, 40 percent were from managers and supervisors, 29 percent were from health and safety personnel (other than industrial hygienists), and 24 percent were from industrial hygienists.

Of the health care providers who called in 1986, 67 percent were physicians (70 percent from private practices). Nurses (12 percent) and genetics counselors (9 percent) were the other major groups who called in 1986.

Approximately one-third of the government agency inquiries in 1986 were from California OSHA. The majority of these callers were industrial hygienists requesting information for worksite inspections.

Analysis of a subset of 1986 callers (562 inquiries received in the fourth quarter of 1986) showed that 39 percent of the employers, 36 percent of the health care providers, 33 percent

Address reprint requests to Kate Cummings, MPH, Hazard Evaluation System and Information Service (HESIS), California Departments of Health Services/Industrial Relations, 2151 Berkeley Way, Berkeley, CA 94704. Dr. Quint is with HESIS; Ms. Cummings and Ms. Handley are with the Health Officers Association of California. This paper, submitted to the *Journal* December 12, 1988, was revised and accepted for publication July 17, 1989.

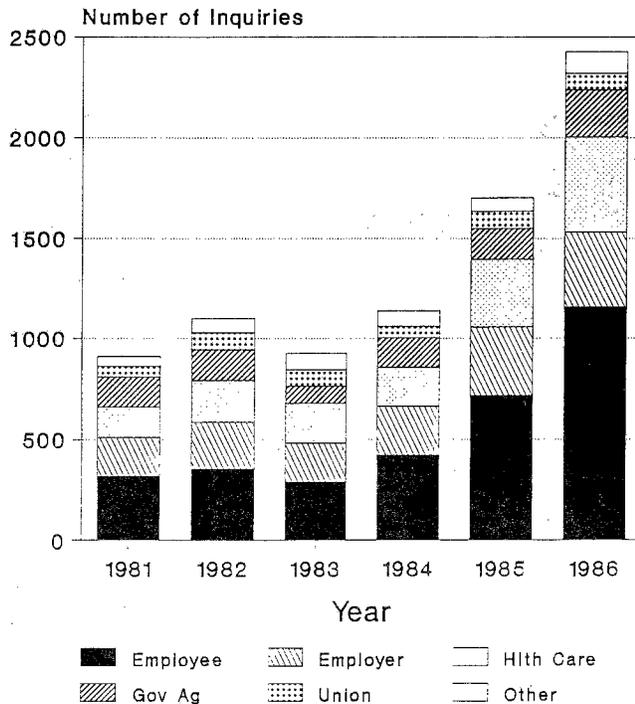


FIGURE 1—Number of Telephone Inquiry Response System Inquiries by Caller Group, 1981-86 (Caller groups defined under Methods)

of the union representatives, and 26 percent of the callers from government agencies were repeat callers. By comparison, only 2 percent of the employees had used the hotline previously.

Based on 466 inquiries from all callers in the fourth quarter of 1986, 48 percent concerned employment in service industries, 28 percent in manufacturing industries, and 8 percent in construction industries. The remaining inquiries

concerned employment in transportation, communication, electric, gas, sanitary services (6 percent), agriculture (4 percent), public administration (4 percent), and retail (2 percent) industries. As a point of reference, the service industry was about 24 percent and the manufacturing industry about 18 percent of all non-agricultural California employees in 1986.<sup>2</sup> The types of industries included under services and manufacturing, along with typical occupations and agents of concern, are described in Tables 1 and 2, respectively.

Each year, multiple (10 or more) inquiries are received on 40 to 50 agents. The top 40 agents for which consultations were provided in 1986 are listed in Table 3.

Most caller concerns fall into three major categories. Average percentages of total inquiries for each category from 1981 through 1986 were 65 percent for general health hazard information, 22 percent symptom-related, and 13 percent pregnancy outcome.

The number of pregnancy-related inquiries received between 1981 and 1986 varied greatly. From 1981 through 1983 an average of 56 inquiries were received per year compared to an average of 375 inquiries per year from 1984 through 1986. A complete analysis of the pregnancy inquiries will be published in a separate report.<sup>3</sup>

Further analysis of 584 symptom-related inquiries received in 1986 showed that most were from employees (51 percent) and health care providers (26 percent), mainly physicians. Small percentages of symptom inquiries were from employers (8 percent) and government agencies (7 percent). California OSHA industrial hygienists inquiring about symptomatic employees encountered during worksite inspections represented about 60 percent of the symptom-related inquiries from government agencies.

### Discussion

The preceding statistics clearly demonstrate that there is an increasing demand for acute and chronic health effects

TABLE 1—Service Industries,<sup>a</sup> Typical Occupations and Agents Inquired about during 4th Quarter, 1986

Industry	Occupation	Agents
Business (N = 86) <sup>b,c</sup>	Office workers	Video display terminals (VDTs), carbonless copy paper, photo copier chemicals, paint, carpet glues, indoor air contaminants, pesticides, asbestos
	Indoor pesticide applicators	organophosphate pesticides
Personal (N = 34)	Photographers, photo lab technicians	amines, formaldehyde, hydroquinone
	Custodians	alkalis, alcohols, cleaners containing glycol ethers
	Cosmetologists	hair dyes
	Manicurists	acrylic nail products (acrylates)
Health (N = 32)	Dry cleaners	perchloroethylene
	Laundry workers	alkalis (various products)
	Dental lab technicians	mercury, epoxy resins
	Histology, pathology lab technicians	formaldehyde, xylene, alcohols
	Hospital lab technicians	biological hazards, radiation
	Dental assistants	nitrous oxide, methyl methacrylate, mercury, formaldehyde
Educational (N = 18)	Nurses	antineoplastic drugs, ethylene oxide, organic solvents
	Anesthesiologists	nitrous oxide, anesthetic waste gases
	Teachers	PCBs, carpet glues, indoor air contaminants, photocopier chemicals, asbestos, fluorescent lights
Miscellaneous (N = 18)	Librarians	asbestos
Miscellaneous Repair (N = 16)	Artists	lead, dyes, pigments
	Welders	welding fumes, metals
Auto Repair (N = 9)	Furniture refinishers	methanol, methyl ethyl ketone
	Mechanics	asbestos
	Car painters and strippers	methylene chloride, toluene, xylene, phenols, isocyanates (specialty paints)

<sup>a</sup>Coded using a combination of industry, occupation, and narrative information.

<sup>b</sup>N = Total inquiries.

<sup>c</sup>Total Service Industry Inquiries = 222. Industries with less than nine inquiries are not shown.

TABLE 2—Manufacturing Industries,<sup>a</sup> Typical Occupations and Agents Inquired about during 4th Quarter, 1986

Industry	Occupations	Agents
Electrical Machinery Equipment and Supplies (N = 29) <sup>b,c</sup>	Assemblers, Parts cleaners, Wafer fabricators/processors	soldering fumes, organic solvents, epoxy resins, methyl ethyl ketone, glycol ethers, arsine, fluorides
Transportation Equipment (N = 14)	Boat builders Ship builders	plastics, fiberglass, ketones epoxy resins
Chemicals and Allied Products (N = 12)	Chemical workers	acrylamide, metals, sulfur compounds
Printing (N = 11)	Printers	methylene chloride, perchloroethylene, glycol ethers
Stone, Glass, Concrete Products (N = 11)	Silk screener	organic solvents, acids
Fabricated Metal Products (N = 10)	Glass factory employees Machinists	organotin, silica, kerosene glycol ethers, organic solvents
	Welders	welding fumes
	Solders	solder fumes, fluorocarbons
Machinery (Non-Electrical) (N = 7)	Machinists	lead, thorium, cadmium
Food and Kindred Products (N = 7)	Food processors	chlorine, phosgene, sulfur dioxide
	Winery employees	carbon dioxide, nitrogen compounds
Rubber and Misc. Plastic Products (N = 6)	Plastics/Teflon industry employees	organic solvents, polymers

<sup>a</sup>Coded using a combination of industry, occupation and narrative information

<sup>b</sup>N = Total inquiries

<sup>c</sup>Total Manufacturing Industry Inquiries = 130. Industries with less than six inquiries are not shown.

TABLE 3—Agents Most Frequently Inquired about in 1986

Agent	Number of Inquiries <sup>a</sup>
glycol ethers	119
methylene chloride	108
trichloroethane (1,1,1)	89
lead and lead salts	82
acetone	76
asbestos	74
formaldehyde	73
fluorocarbons	71
acrylates (including acrylic nails)	67
toluene	64
xylene	61
methyl ethyl ketone	57
solvents, not otherwise specified	54
isopropanol	49
polychlorinated biphenyls	48
ammonia	43
paints	43
video display terminals (VDTs)	41
malathion	39
ethylene oxide	39
methanol	38
isocyanates	37
mercury (organic, metallic, inorganic)	35
silica and silicates	33
chromium and chromium salts	33
sulfuric acid	32
perchloroethylene	32
hydrochloric acid	31
arsenic and arsenic salts	29
epoxies	27
chlorpyrifos	26
sodium hydroxide	24
monophenol	21
trichloroethylene	20
fluorescent light fixtures	19
chlorine	18
diazinon	18
nitric acid	17
benzene	17
carbon monoxide	17

<sup>a</sup>Number of times agent was inquired about. May not represent distinct consultations since one consultation often involved multiple agents.

information for workplace exposures. Provision of this information is the core of the Hazard Communication Standard.

Eighty percent of all employers calling in 1986 wanted general health hazard information (such as acute and chronic

health effects and industrial hygiene information), suggesting that this group needs further assistance to meet fully the challenge of its responsibility.

Of the various callers, employees are the largest and fastest growing subset. In 1986, 38 percent of all employees were primarily concerned with general health hazard information while 36 percent called about pregnancy concerns and 26 percent called because they had symptoms. Calls from health care providers closely paralleled this distribution. Both employee and health care provider symptom calls focused largely on acute effects and required, for the most part, information and industrial hygiene interventions to reduce exposures.

The telephone hotline is sometimes a limited forum for disseminating useful information. Specifically, some callers need to be educated about basic principles of toxicology before their complex questions (e.g., what is the cancer risk?) can be answered.

The purpose of hotlines is to provide ready access to information rather than education. Perhaps the service would have broader impact if it targeted those individuals who can use and disseminate the technical information provided. Callers who would be potential targets for a technical assistance hotline (health care providers, government agencies, union representatives, and employers) are by virtue of their jobs in contact with many employees. Thus, the information provided to them may benefit many employees. The high percentage of repeat callers among these potential target groups indicates that the hotline, to some extent, has already established an identity as a technical assistance service.

Since hotlines do not necessarily present the best forum for some types of callers, we also publish and disseminate chemical fact sheets and other educational material.

#### ACKNOWLEDGMENTS

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