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Editorial: Surveillance for Pesticide-Related Illness—Lessons from California

In 1993, the US General Accounting Office concluded that there were insufficient data to determine accurately the national incidence or prevalence of work-related pesticide illnesses in the farm sector.¹ This assessment is equally applicable to all pesticide-related illness in the United States, occupational and nonoccupational, on or off the farm. Current data sources, the General Accounting Office concluded, were "quite limited in coverage, comprehensiveness, and quality of information." The sole exception, the Government Accounting Office noted, was the surveillance system in California.

The worker safety program in the California Department of Pesticide Regulation is, like its overall approach to pesticide regulation, the most stringent in the United States.² Requirements for worker training, reentry intervals, protective equipment, closed systems, and cholinesterase monitoring of exposed workers go beyond federal regulations; and health care providers' reporting of pesticide-related illness to local health departments has been mandated since 1971. These reports are supplemented by cases identified in California's workers' compensation system. All cases are investigated by county agricultural commissioners.

In 1992, 2694 suspected pesticide-related illness cases were ascertained. Of these, 1858 (69%) were categorized as either "definitely" (544 cases), "probably" (542 cases), or "possibly" (772 cases) related to pesticide exposure.³ As with all health surveillance systems based on provider reporting,⁴ these numbers undoubtedly underestimate the true disease incidence.

California's surveillance system provides routine information essential for prevention. The system provides an estimate of the magnitude of the problem of pesticide-related illness, identifies clusters and previously unrecognized problems, elucidates risk factors, and identifies high-risk workers, workplaces, and work

practices. The information is used to draft and amend regulations, target enforcement, guide research, plan and target education and training initiatives, and evaluate the impact of its activities.

The usefulness of the California surveillance data strongly suggests that state-based surveillance could be an important constituent of a national surveillance strategy. The generalizability of the California models remains uncertain, however. The state and local health, environment, and agriculture agencies in California may be relatively resource-rich compared with those in other states. Surveillance efforts currently underway in several other states, including Arizona, New York, Oregon, Texas, and Washington, may yield surveillance models that are less resource-intensive and thus more feasible for widespread use. Since 25 states currently have laws or regulations requiring reporting of pesticide-related illnesses and injuries to the state's department of public health and/or department of agriculture,¹ the potential exists for broad national coverage.

Data from multiple states, coupled with information from other data collection systems, may ultimately constitute the comprehensive national surveillance strategy whose absence was so clearly documented by the General Accounting Office. Existing data systems include the American Association of Poison Control Centers' national data collection system, which contains information on pesticide-related calls to regional and local poison control centers,⁵ and the US Environmental Protection Agency's (EPA) Incident Data System, consisting of voluntary reports by the public as well as mandatory reports of adverse health effects by pesticide manufacturers (personal communication, Jerry Blondell, EPA, March 1995).

Other potential data sources include the Consumer Product Safety Commission's National Electronic Injury Surveillance System, which collects information

on consumer product-related injuries seen in a probability sample of US emergency rooms and, until 1988, included detailed data on pesticide-related emergency room visits (personal communication, Jerry Blondell, EPA, March 1995), and pesticide-specific hospital discharge surveys, such as the EPA-funded studies conducted by Colorado State University in the 1970s and 1980s.^{6,7}

One of the most important roles of surveillance is to provide information on the effectiveness of current prevention efforts. In this issue of the Journal, Maizlish et al.⁸ provide information on prevention effectiveness beyond that provided by California's statewide surveillance system, information that illustrates the potential—and need—for new approaches to the prevention of pesticide-related illness.

In 1987, the California Department of Health Services was awarded funds by the National Institute for Occupational Safety and Health under the Sentinel Event Notification System for Occupational Risks (SENSOR) program to develop enhanced surveillance for work-related pesticide illness in a single large agricultural county, parallel to the state system.

County health care professionals were recruited to report cases of pesticide illness directly to the health department. SENSOR staff conducted follow-up interviews with patients and employers and performed on-site inspections. SENSOR inspection findings were then compared with reports of inspections in those same workplaces performed by county enforcement personnel as part of the statewide surveillance system. SENSOR site inspectors observed deficiencies at almost all 15 worksites visited, and, according to the authors, only a "very low percentage of recommendations to counter these defi-

Editor's Note. See related article by Maizlish et al. (p 806) in this issue.

ciencies were identified by agricultural enforcement personnel." Addressing many of these deficiencies, the authors suggest, was beyond the jurisdiction and/or expertise of the enforcement personnel. This finding is based on extremely limited data, but, if corroborated, has important implications for current prevention efforts. The issue certainly merits additional study.

One possible way to improve prevention efforts is highlighted by the California SENSOR results demonstrating the apparent receptivity of employers to consultation on reduction of pesticide use. Whether this receptivity is related to the recent occurrence of a pesticide illness, whether all employers would be similarly receptive and whether "receptivity" will result in actual use reduction are important areas for further investigation.

Additional prevention strategies include the following: the design and introduction of better work practices, engineering controls, and protective equipment for pesticide applicators; improved regulatory and enforcement approaches; more research on the hazards posed by these

agents; emphasis on the development and use of less toxic agents; and broader and more effective education and training efforts. A comprehensive national surveillance system, with a network of state-based surveillance systems as its backbone, will be crucial in guiding and evaluating future prevention efforts. □

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Annotation: A Community-Focused Strategy for the Control of Day-Care Center Shigellosis

The article in this issue of the Journal by Mohle-Boetani et al. articulates a novel strategy for the control of community outbreaks of shigellosis associated with day-care centers.¹ Through the years, attempts to control day-care center-associated shigellosis through the use of "standard control measures" have met with, at best, limited success. These so-called "standard" methods have relied upon visiting nurses to collect stool samples from symptomatic and asymptomatic household members of culture-confirmed cases, exclusion of symptomatic children from day-care centers, often exclusion of culture-positive persons from school and work, and incidental advice concerning hand washing. This strategy appeals to decision makers because the flurry of activity and the perceived authority of the laboratory create the impression of concern coupled with action. The strategy responds to the perceived mandate to "do something," which often confronts officials who call the shots in outbreak situations. Aside from its questionable success, the standard strategy is costly.

Mohle-Boetani and colleagues' article challenges the reader to consider an alternative way, a strategy which underscores the link between the problem in day-care centers and community cases, mobilizes community action, emphasizes health education, and deemphasizes the importance of laboratory confirmation of every case. Its appeal is in its scientific rationale and undoubtedly lower costs, and also in the fact that it worked so dramatically in the outbreak reported. This strategy deserves the careful consideration of all concerned with the control of this problem.

The article records a community-wide outbreak of shigellosis traced to day-care centers. The attack rate was remarkably high, exceeding 100 cases/100 000 persons. Despite "standard control measures," the outbreak continued for 5 months. It ended soon after the implementation of this alternative strategy.

The new strategy aimed to interrupt the cycle of fecal-oral transmission through health education by promoting handwashing, not just in day-care centers, but

throughout the community. Community resources were mobilized to get this message across. The "Shigella Task Force" was established, with representation of concerned health units and input from the media, schools, park and recreation staff, and a community service agency. Members of the Task Force, in addition to their other tasks, became active promoters of hand washing. The exclusionary elements of the plan were less rigid than in the regular plan. Convalescing asymptomatic day-care centers staff, teachers, and elementary school children were encouraged to adhere to strict hand-washing practices rather than being excluded because stool cultures were positive. Convalescing children were cared for in separate areas of day-care centers rather than being confined in their homes or surreptitiously taken to other day-care centers.

The mobilization of community resources represented in the "Shigella Task

Editor's Note. See related article by Mohle-Boetani et al. (p 812) in this issue.