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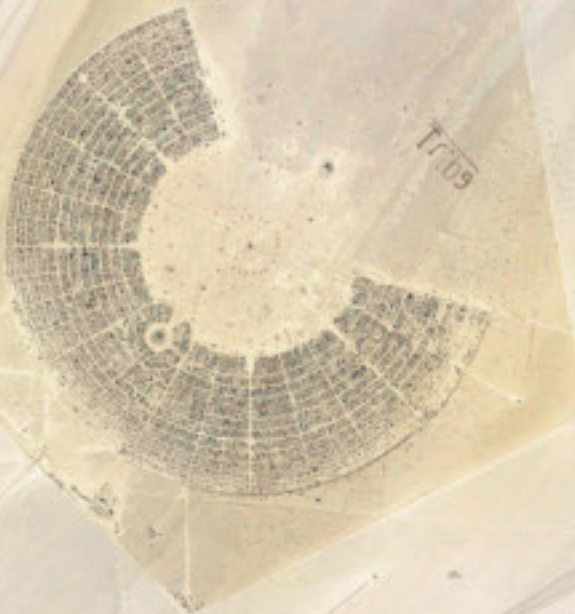


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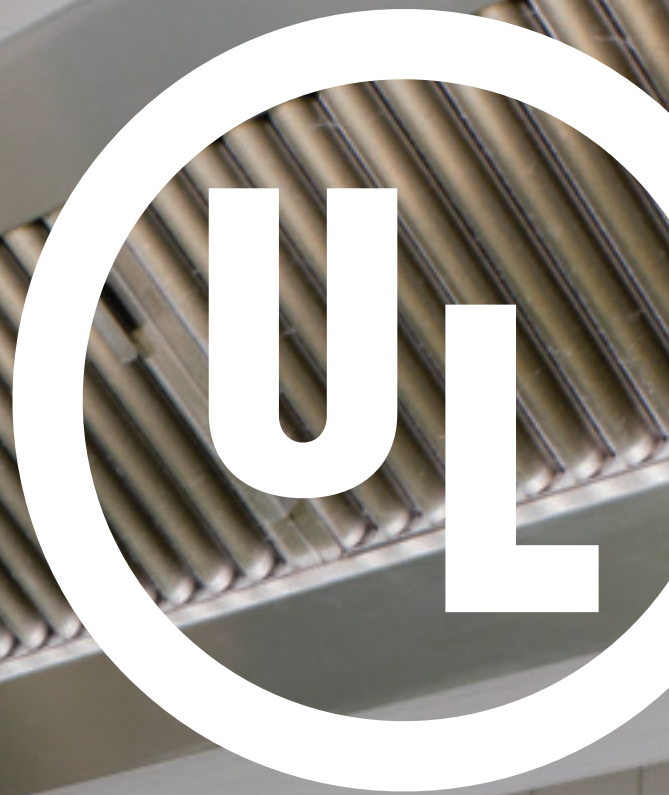


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ABOUT THE COVER



The spectacle that pops up in the middle of the Black Rock Desert that is “Burning Man,” an annual eight-day festival in August and September 100

miles north of Reno, Nevada, produces what the author of this month’s cover feature calls “Burning Man, Extreme Environmental Health.” This guest commentary explains the unique environmental health challenges posed by the festival for the Nevada State Health Division, from food safety and temporary food vendor permits to portable toilet inspections to surveillance for possible foodborne illness outbreaks.

See page 14.

Cover photos © Burning Man (www.burningman.com) | John Curley; Bill Klemens; Susan Becker. Arial Images © 2012 Google | GeoEye, USDA Farm Service Agency.

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► PRESIDENT'S MESSAGE



Mel Knight, REHS

The Curation* of Environmental Health Data

“Every two days now we create as much information as we did from the dawn of civilization up until 2003.”
— Eric Schmidt, Google CEO

The volume and range of environmental health activities in the U.S. is awe-inspiring. Three to five thousand governmental agencies annually perform an estimated 3.5 million food safety inspections, close more than 20,000 retail food facilities, investigate as many as 40,000 reports of foodborne illness, inspect more than 500,000 pools and spas, and review the hazardous materials practices of more than 25 million businesses. These numbers are all estimates drawn from different sources as there is currently no national database or data repository to accurately track these actions. These environmental health data exist, but they reside in multiple forms and formats, file cabinets and file servers, cardboard boxes, and maybe even some car trunks. It is impractical to think we can easily gather and utilize these data, but we would be negligent if we did not make an honest effort to capture and analyze the available fraction of this useful information.

Virtually every federal, state, and local agency has some means to record their activities and findings. Federal agencies typically will store their information in isolated silos, with little if any coordination among and between the Food and Drug Administration (FDA), U.S. Environmental Protection Agency, Centers for Disease Control and Prevention, Department of Homeland Security, U.S. Department of Agriculture,

While environmental health data management is challenging, modern technology may now offer some solutions that may make this task less formidable.

and others with a national database. State agencies offer a somewhat higher degree of standardized data practices, especially when they have responsibility for monitoring the activities of local agencies. Individual local agencies frequently do a good job of integrating multiple program data, but their sheer numbers ensure widely differing practices.

While environmental health data management is challenging, modern technology may now offer some solutions that may make this task less formidable. The vast majority of all agencies now utilize some form of digital data storage, and many if not most are migrating to web-based application software. The task of sorting the more important components

of these data can be initiated now and it will continually ease over time.

The return on investment for collecting, mining, and utilizing these data can be significant. We now have limited-scale studies that correlate levels of regulatory activity to compliance status and the incidence of illness. Agencies that are providing ease in Internet access to inspection records are finding a high level of interest by the general public. National restaurant chains are requesting access to regulatory data that they can use for quality control purposes. All of these activities would be enhanced with a more standardized national data repository.

With so many activities and interested parties, it is easy to be stopped by planning paralysis. We might also be deterred by seeking universal participation or the perfect system. There will be issues with access, security, and quality control that we have previously experienced with nearly all systems. As we have found with the initiation of other significant endeavors, success will likely come with a tenacious approach to successfully completing incremental components.

One promising starting point for establishing a national environmental health data system might be found in the recently passed FDA Food Safety Modernization Act (FSMA). For the past several months I have been a participant in an FDA-sponsored FSMA implementation team that is charged with carrying out the provision in the law that mandates “sharing information on a timely basis among public health and food regulatory agencies, with the food industry, with health care

providers, and with the public.” The activity to date has been aimed at initially integrating federal and state regulatory information, with plans to subsequently incorporate local agency data and the interests of industry, health care providers, and the public.

As there are fewer than a dozen involved federal agencies, approximately 100 state entities, and thousands of local agencies, it is logical to begin with federal and state information sharing. Local environmental health jurisdictions do not have to necessarily be far behind, especially as many large local agencies may already be prepared to participate in information exchanges. For example, the retail food safety program in Los Angeles County serves a population of nearly 10 million residents and several other local agencies in metropolitan areas also provide service to populations larger than many states. Local agencies may also offer an opportunity in that a large number of cities and counties utilize a limited number of commercial data vendors. This small number of environmental health

software specialists provide similar if not standardized data systems for 100 or more client jurisdictions each.

The FSMA-initiated integration of food safety information can be the first of many steps toward establishing a more comprehensive environmental health data system. Most local environmental health agencies have already found ways to integrate information systems for many different program areas including food safety, water protection, waste management, recreational health, and more.

Until we have more comprehensive data available, we will continue to have difficulty establishing evidence of the efficacy of our activities and programs. Do our inspections result in safer industry practices? Do enforcement actions deter further noncompliance? Does mandatory training improve the practices of industry workers? What is the relationship of regulatory activity to industry practices to morbidity and mortality? The answers to these questions and many more can be found in existing environmental health data sources.

This is a tremendous resource that should not be squandered. We owe it to the profession, industry, and the general public to initiate a good faith effort to make this information available. As with other significant activities that span the spectrum of environmental health practice, I see NEHA in the forefront of this timely initiative that will certainly influence our perspectives and practices. 🇺🇸

Mel Knight REHS

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*Digital curation is generally referred to as the process of establishing and developing long-term repositories of digital assets for current and future reference by researchers, scientists, historians, and scholars. Enterprises are starting to utilize digital curation to improve the quality of information and data within their operational and strategic processes.

Source: Wikipedia, the free encyclopedia.

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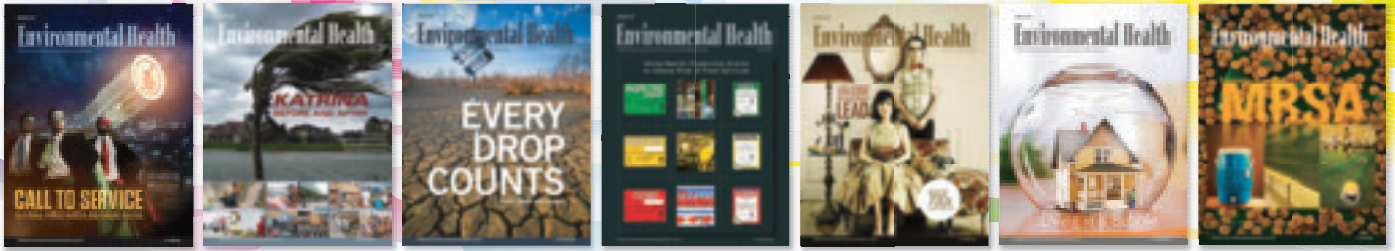
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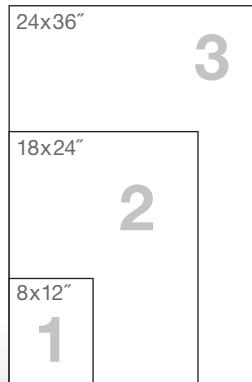
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► SPECIAL REPORT

Murder by Radiation Poisoning: Implications for Public Health

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Abstract On November 23, 2006, former Russian military intelligence officer Alexander Litvinenko died in a London hospital. Authorities determined he was deliberately poisoned with the radionuclide Polonium-210 (^{210}Po). Police subsequently discovered that those involved in this crime had—apparently inadvertently—spread ^{210}Po over many locations in London. The United Kingdom Health Protection Agency (HPA) contacted many persons who might have been exposed to ^{210}Po and provided voluntary urine testing. Some of those identified as potentially exposed were U.S. citizens, whom the HPA requested that the Centers for Disease Control and Prevention (CDC) assist in contacting. CDC also provided health care professionals and state and local public health officials with guidance as to how they might respond should a Litvinenko-like incident occur in the U.S. This guidance has resulted in the identification of a number of lessons that can be useful to public health and medical authorities in planning for radiological dispersion incidents. Eight such lessons are discussed in this article.

Introduction

On November 23, 2006, shortly before former Russian military intelligence officer Alexander Litvinenko died in a London hospital, authorities determined he suffered from acute radiation syndrome after ingestion of Polonium-210 (^{210}Po). The Metropolitan Police immediately began a criminal investigation.

As a rule, public health authorities do not actively participate in criminal investigations, let alone any that involve a targeted attack resulting in a single homicide. But the

unique nature of the weapon used to kill Mr. Litvinenko put many people at risk—people who had nothing to do with the crime. ^{210}Po is very deadly, and it very easily becomes airborne (Roessler, 2007). If ^{210}Po is released into the environment, the contamination quickly spreads to surrounding areas. The body takes in ^{210}Po by ingestion, inhalation, or absorption through skin; thus ^{210}Po can find its way into virtually all body excreta, including perspiration (Harrison, Leggett, Lloyd, Phipps, & Scott, 2007). People internally

contaminated with ^{210}Po can therefore spread it to anything they or their excreta contact.

In fact, a London *Telegraph* article reported that the authorities declared Mr. Litvinenko's body a major environmental hazard and held it for two weeks. The body was only released in a sealed casket provided by the United Kingdom Health Protection Agency (HPA). The family was told that if they were to cremate Mr. Litvinenko's remains, they would have to wait for 28 years, until all the radioactivity in the body decayed to safe levels—nearly 80 half-lives of ^{210}Po (Volodarsky, 2009).

In the days following Mr. Litvinenko's death, the Metropolitan Police used technical experts to track the locations visited by “persons of interest” in the case. The alleged perpetrators stayed in three different hotels and, during their apparent rehearsals of the murder, carried containers of ^{210}Po to several different public places. Many of these locations showed detectable traces of ^{210}Po contamination. Investigators initially designated the locations as crime scenes and scoured them for evidence. But more locations than just the crime scenes showed evidence of contamination. Public areas such as hallways, restrooms, and gathering places of various types were also contaminated with ^{210}Po .

After the Metropolitan Police investigators completed their forensic examination of a site, they released it to HPA for further evaluation (Bailey et al., 2010). HPA, in turn, assumed responsibility for environmental monitoring

TABLE 1

Estimated Risk of Death From Deterministic Effects Due to Internal Intake of Polonium-210 (Scott, 2007)

Systemic Body Burden (MBq/kg-body-mass) ^a	Central Estimate of the Risk (%)	Expected Survival Time (Days)
>1	100	1–28
0.4–1	100	50–250
0.03–0.3	1–100	300–500
0–0.02	<1	Normal lifespan for most

^a1 MBq ≈ 0.6 μg.

of all public locations where contamination was positively identified and for taking actions to keep that contamination from spreading (e.g., closing restrooms, painting walls, removing furniture). HPA was also charged with identifying members of the public who had inadvertently come in contact with ²¹⁰Po. Eventually, authorities found ²¹⁰Po in

- the two hospitals where Mr. Litvinenko was treated,
- various business offices in London,
- coffee bars and nightclubs,
- a football (soccer) stadium,
- airplanes,
- automobiles, and
- three hotels.

Thus what began as a targeted, ²¹⁰Po poisoning attack mushroomed into a radiological dispersal incident. A “dirty” bomb is the most commonly feared form of radiological dispersion, where detonation of a conventional explosive device releases radioactive materials into the environment. Here, ²¹⁰Po dispersed into many areas of London became, in effect, a nonexplosive “dirty” bomb.

Methods

As noted, one of HPA’s major responsibilities was to identify persons contaminated with ²¹⁰Po. To do so they interviewed many people who worked in or visited locations of interest, such as hospital workers who attended Mr. Litvinenko. They also released carefully worded public statements designed to educate, to alleviate concerns, and to alert persons believed at increased risk for contamination. People HPA identified as at increased risk were invited to provide the authorities with a 24-hour urine sample to estimate their

total ²¹⁰Po body burden. HPA also provided urine testing to concerned citizens who requested it, even those considered low risk. Through August 2007, HPA provided such biomonitoring (or bioassays) to more than 700 persons (Bailey et al., 2010).

Usually, the health risks associated with environmental exposures to radioactivity are primarily stochastic in nature, such as cancer. As shown in Table 1, however, ²¹⁰Po is so toxic that only small amounts of this material can cause death (Scott, 2007). A quantity of ²¹⁰Po no larger than the period at the end of this sentence would be sufficient to kill a human. Although anyone incidentally exposed to ²¹⁰Po in the environment would probably not receive a lethal dose, in the first days and weeks of the HPA investigation authorities could not rule out that possibility.

Inevitably, some who were potentially contaminated with ²¹⁰Po were foreign nationals. The HPA identified over 600 persons from 52 countries outside the UK as potentially at risk of ²¹⁰Po contamination (Bailey et al., 2010). Of these identified persons, about 25% were U.S. citizens. The Centers for Disease Control and Prevention (CDC) became the main point of contact between HPA and these citizens. Working directly with the HPA and through the U.S. Department of State, CDC advised individual citizens and provided health care professionals and state and local public health officials with guidance on how to respond to this incident.

In March 2007, HPA staff hosted a one-day conference in London. Oral and poster presentations explained their response to Mr. Litvinenko’s death, including lessons learned (Lightfoot, 2007). During the course of

working with both HPA and U.S. officials in response to this incident, CDC staff identified a number of teachable opportunities useful for helping public health officials prepare for a radiological incident in the U.S. This article summarizes those opportunities.

Lessons Identified

The sections below are summaries of eight major lessons CDC staff have identified as a result of our domestic response to this incident. Oftentimes, such items are presented as “lessons learned” or issues identified. We have adopted the approach used by our UK colleagues. Until actions are actually implemented to correct identified issues, no lesson has really been learned.

1. Identification of the Poison

As noted above, until just hours before death ²¹⁰Po had not been identified as the poison that killed Mr. Litvinenko. At some point during his medical care, hospital personnel reportedly surveyed Mr. Litvinenko with a standard Geiger-Mueller counter. Finding no evidence of contamination, they ruled out radiation poisoning as a cause of his unexplained illness (Perkins, 2007). But ²¹⁰Po decays primarily by release of alpha particles, and a standard Geiger-Mueller counter cannot measure alpha particles inside a person. Only a well-equipped and well-trained radiation spectroscopy laboratory can identify a person internally contaminated with such a radionuclide.

Here, however, delayed identification of the radionuclide did not significantly affect Mr. Litvinenko’s prognosis. Given ²¹⁰Po’s lethality, even if the treating physician had known immediately what Mr. Litvinenko had ingested, death was a virtual certainty. Yet if Mr. Litvinenko had been exposed to some other radionuclide, death might not have occurred. The point is that radionuclide poisoning is a rare incident, and authorities eventually did identify the poison. But whenever public health practitioners are faced with an illness without an obvious diagnosis, they should keep radiation poisoning in mind as a possible cause.

2. Public Communication

Mr. Litvinenko died on a Thursday. By Friday morning HPA had already begun the process of providing key public health messages. HPA

leadership appeared on all major national television outlets, and staff posted public information on the agency's Web site (Lewis, 2007). One of HPA's stated objectives was to reassure the public that, in general, people were at very low risk of adverse health effects.

One obstacle HPA faced in reaching its objectives was the ongoing criminal investigation. HPA was prevented from releasing pertinent details about the case that would have allowed persons to make informed decisions about their own risk level. That said, researchers looking at the effectiveness of HPA's messages determined that the public understood the trigger incident was criminal in nature, not terrorist. And people generally trusted the opinion of public health officials who told them that they were at low risk for contamination. Yet those same members of the public who participated in the communications effectiveness research study made clear that they preferred solid information to reassurances (Rubin et al., 2007).

People who did undergo urine testing had difficulty understanding the significance and long-term implications of the test results as reported. ²¹⁰Po is a naturally occurring radionuclide, and all people have some level of ²¹⁰Po in their urine. In general, smokers have higher levels of ²¹⁰Po in their urine than do nonsmokers (Santos, Gouvea, & Dutra, 1994). Although population reference ranges for ²¹⁰Po levels in urine are not available, HPA surveyed the results of the urine measurements for each person tested, and categorized those results as

- measured levels are of no health concern (estimated doses <1 mSv [milliSievert]);
- measured levels represent some level of additional exposure but they do not represent a health concern (estimated doses ≥1 mSv–<6 mSv); or
- measured levels represent some level of concern for increased risk of developing cancer sometime in the future (estimated doses ≥6 mSv).

When reporting results for U.S. citizens, CDC used the same language.

Table 2 contains monitoring results reported for UK residents. Over 92% of the results were in the “of no concern” category. People interviewed in the postincident communication study (Rubin et al., 2007) reported they found this reporting method “unhelpfully vague.” These respondents wanted their

TABLE 2

Results as of March 23, 2007, for Urine Analyses for Polonium-210 Conducted in the United Kingdom (Bailey et al., 2010)

Demographic	# Samples Assessed	<1 mSv ^a	1 mSv–<6 mSv	≥6 mSv
Health care workers	78	77	1	0
Others	674	622	35	17
Total	752	699	36	17

^amSv = milliSievert.

actual numerical results and information on how to interpret them, especially insofar as long-term health effects were concerned (Rubin et al., 2007). These reactions illustrate the challenge of providing appropriate health information to the public when radiation or radioactive materials are involved. Reports from Canada (Cornett et al., 2009) and Israel (Brosh-Nissimov, Havkin, Davidovitch, Poles, & Shapira, 2008) have helped to expand the international discussion of the public communication challenges in an incident such as Mr. Litvinenko's murder.

One of CDC's first efforts to assess U.S. citizens for potential ²¹⁰Po exposure involved individual contact. In most cases, CDC contacted citizens by phone, e-mail, or letter. In others, CDC contacted state or local health departments and provided lists of citizens to contact within their jurisdictions. Additional resources such as phone interview scripts were provided to the state and local health departments for initial interviews and for individual follow-up.

CDC also prepared and provided educational information about the incident and about laboratory testing to citizens, to their private physicians, and to state and local health departments. Communications and educational information were posted on the CDC Web site, disseminated through CDC's Health Alert Network and EPI-X secure network notification systems, and provided directly to citizens and their physicians.

Communications challenges with state and local health agencies primarily involved limited awareness or understanding. A particular problem was a lack of knowledge about the state and local health department

responsibilities during a radioactive materials incident. In some cases, state and local health department officials could not locate their own state's radiation control program contact. This occurred even in those states where the government's organizational structure placed public health departments and radiation control program offices in a common location. CDC provided public health departments with contact information for their radiation control program, if requested. But CDC cannot be certain that other health departments made the correct connections to their local radiation control offices.

Some U.S. citizens or their physicians requested urine testing. CDC either offered to collect the specimens and have them analyzed or offered referrals to accredited private laboratories. CDC laboratory personnel also provided collection materials and information regarding sample collection, processing, shipping, and offered assistance in interpreting the laboratory results.

Thirty-one persons requested to have their laboratory urine results interpreted by CDC. Using these laboratory results, CDC health physics staff performed dose assessments. These individual dose assessments were based on internationally recognized and accepted methods similar to the dose assessments HPA used when it assessed UK citizens for potential exposure (Bailey et al., 2010). CDC communicated the interpreted results by direct mail. All dose estimates for U.S. citizens tested were <1 mSv.

3. International Collaboration

U.S. citizens in the UK in November 2007 included those on business travel and tourists

on a possible once-in-a-lifetime visit to London. But on any given day, every major city in the world hosts international visitors. Public health officials must be prepared to collaborate with the international public health community in radiological incidents that occur within their jurisdictions.

The HPA approached this challenge via two routes. First, they worked through the UK Foreign and Commonwealth Office to provide the embassies the names of all identified persons at risk who had been potentially contaminated with radioactive material. Second, HPA took advantage of preexisting contacts with health officials in other nations and contacted them directly (Bailey et al., 2010). CDC became involved through both mechanisms. Rules finalized after this incident now require international notification of public health incidents involving radiation and radioactive materials (World Health Organization, 2005). Public health officials must be prepared to implement such requirements.

4. Identification of Potentially Contaminated Persons

HPA immediately faced the question of how to identify people potentially contaminated with ^{210}Po . This question applied, of course, to both UK residents and to international visitors. For example, officials used credit card receipts to identify some people who had visited contaminated bars and restaurants. But for one person to pay the bill for everyone at a table is not uncommon. In business settings, especially, a single credit card receipt may represent several persons. Only a conversation with the credit card holder will reveal that information, and that assumes the credit card holder will share it with an interviewer. Moreover, some people pay their bar or restaurant bills with cash. Thus some potentially exposed persons associated with this incident will likely remain unidentified.

HPA also prepared carefully crafted public messages and established telephone lines to identify potentially contaminated people whom HPA could not readily identify by name. This procedure, of course, resulted in a number of calls from people who were highly unlikely to have been contaminated but who were nonetheless concerned about radiation exposure. Operators receiving such calls must be prepared to triage effectively and compassionately.

CDC likewise experienced challenges in identifying U.S. citizens potentially exposed to ^{210}Po while visiting London. Initial lists of identified citizens obtained from the HPA were expanded to include others subsequently identified through telephone interviews. For example, additional persons were added based on those who may have paid for a number of persons on a single credit card at a location of interest or of known contamination. Others were added based on hotel booking in one name reserved for another person in the same business organization.

Any major public health emergency will have to deal with the challenge of identifying potentially affected people. But incidents involving radiation exposure are rare, and during such incidents people have been known to be more concerned about radiation than about many other contaminants or infectious agents. That could mean a flood of telephone and Internet inquiries, many of which could lead to identification of still more potentially contaminated persons. The public health community should carefully preplan to deal with identification issues associated with such an incident.

5. Contamination Control

The “silent source” is another terrorist radiation-exposure tactic. It involves the placement of radioactive material in a location where people are covertly exposed to radiation, but without contamination from the radioactive material itself. Such an attack is often premised on a sufficient time lag before discovery to expose and therefore harm a maximum number of people. Some press reports have suggested the occurrence of at least one silent source incident in Russia (Specter, 1995).

The London ^{210}Po poisoning was a contamination incident, not a silent source incident. Still, one common characteristic was nondiscovery of the poisoning effects until many days after initiation of the contamination process. In London, before authorities could control the ^{210}Po contamination, it had already fanned out to expose large numbers of people.

People in London stated that they understood the ^{210}Po poisoning was aimed at one person and that they were not targets. If, however, terrorists were to use a similar incident to target a larger group of people, how quickly that incident was discovered could affect the

public-health messaging process. For example, UK officials were very concerned about reassuring the public that the risk of harm to them was very low. A terrorist incident would likely make that task much more difficult, and the economic impact on a major city from such an incident could be very high.

6. Medical Management

The U.S. Department of Health and Human Services (HHS), including CDC, recommends that during a radiological incident, medical management of life-threatening injuries should nearly always take precedence over contamination concerns (HHS, 2010). Numerous national and international radiation protection organizations support this position.

But some first responders and first receivers have traditionally rejected it. As part of all-hazards training, health care providers have been taught not to transport or treat any person contaminated with a biological, chemical, or radioactive agent until after decontamination. Only after sustaining a penetrating injury from a highly radioactive piece of shrapnel should a victim receive decontamination before delivery of other life-saving care. And the shrapnel is promptly removed primarily to prevent high-dose radiation exposure to first responders and medical personnel (Smith, Ansari, & Harper, 2005).

Note in this regard that in the Litvinenko case, prehospital health care providers, the medical staff, the housekeeping staff, and others who tended him from the time he became ill until almost his dying moment did not know that he and all of his body fluids, including excreta, were highly radioactive. Hospital staff assumed they were dealing with an unknown infectious or communicable disease. They used the standard “universal precautions” to protect themselves. HPA was obviously very concerned about the potential for internal contamination of the caretakers. In Table 2 HPA has reported the ^{210}Po bioassay results for 78 health care workers (Bailey et al., 2010). HPA identified one worker who may have been exposed, but the level was below any health concern. Results for the other 77 health care workers all showed levels “of no concern.”

Although this was most certainly not a well-controlled, statistically defensible, epidemiological study, the “no level of concern” results for 77 workers adds credence to CDC’s position that immediate life threatening care

be given before decontamination. The public health and medical community has a responsibility to protect and treat potential victims of terrorist activities involving radioactive materials and to help the medical and emergency response personnel understand how to protect themselves, their staff, and their facilities and equipment while administering life-saving aid.

7. Laboratory Capacity

The HPA bioassay laboratory used a 24-hour collection of urine to assess people for ^{210}Po contamination. Although HPA radioanalytical chemists knew how to do this, they lacked the capacity to perform rapidly a significant number of such tests, especially in a very short period of time. HPA thus had to establish a validated procedure they could use for this incident and then reach out to every UK laboratory they could identify who could also do the analysis using the same or equivalent validated procedure. They also established quality control procedures using performance testing materials to insure that results from all involved laboratories were accurate, precise, and within acceptable limits. It was a considerable challenge for the UK to have enough bioassay laboratory capacity to perform the 752 analyses that they conducted (Table 2) (Bailey et al., 2010).

CDC staff faced a similar problem as their British colleagues: a shortage of accredited laboratories capable of reliable ^{210}Po assays on clinical samples. An aggressive search by CDC identified any one of a number of state and local government laboratories capable of measuring radionuclides in environmental media (such as water and soil). None, however, were clinical laboratory improvement amendments (CLIA)-certified to assay for ^{210}Po in urine. CDC did locate one CLIA-certified commercial laboratory prepared to perform these measurements; one additional laboratory attained CLIA certification in late December 2006. In total, CDC obtained the ^{210}Po urinary assay results for 31 U.S. citizens. All bioassay results for U.S. citizens were “levels of no health concern.”

Another difficulty CDC faced (although not in the UK) was the inability to account for all samples potentially submitted for analysis. Some U.S. citizens may have submitted samples privately through their personal physicians. CDC has no assurance that it has a comprehensive list of results from all U.S. citizen samples

tested. The laboratories performing the assays proved reluctant to share results, citing concern over potential violations of the Health Insurance Portability and Accountability Act of 1996 privacy rule. Inability to obtain a full-line list of potential victims to an incident would surely hamper any efforts at tracking victims of potential incidents.

Fortunately, the number of potentially contaminated U.S. citizens was sufficiently small that one or two laboratories could handle it. The Litvinenko murder, however, exposed our difficulty in monitoring the population rapidly should such an incident ever occur on U.S. soil. We currently lack sufficient laboratory capacity to handle such an incident.

8. Sustaining the Response

One of the major lessons HPA staff identified was the difficulty they faced in sustaining a prolonged response effort (Lightfoot, 2007). Even after mobilizing a significant portion of their organization, the staff worked extended hours, seven days a week, for almost the entire month of December. At a debriefing held in March 2007, HPA reported staff was still involved in the ^{210}Po public health response, albeit at a much lower level of activity than earlier. HPA also noted that many public health officials called upon to assist in the response effort had no formal training in radiation.

In the U.S., response sustainability was not a major limitation. Nevertheless, had a similar incident occurred here, undoubtedly it would have tested the limits of federal, state, and local public health resources.

Although some radiation subject-matter expertise is available throughout the U.S., finding it can be a little difficult. Depending on the locality, radiation control programs and staff may be assigned to a variety of places within the government structure. In some states and cities, for example, radiation control programs are colocated within the public health department. In other states and cities, they are not. During this particular response, CDC was faced with the challenge of putting public health officials and members of the public in contact with their state or local radiation experts.

Because radiation control programs are not located consistently within state and local government structure, it is imperative that public health officials and their radiation control counterparts meet, develop response

plans, and know how to reach each other well in advance of an event involving radiation or radioactive materials.

Conclusion

In the response to any type of incident in which a number of people have been or potentially could have been exposed to radiation or contaminated with radioactive material, the U.S. public health community will play a significant role. The circumstances of Mr. Litvinenko's death have identified a number of useful lessons for planning responses to similar incidents. Public health and medical authorities must learn to

- consider and possibly test for radionuclide poisoning when faced with an illness that does not have an obvious diagnosis,
- prepare appropriate health information for the public when radiation or radioactive materials are involved,
- be prepared to implement international notification requirements for incidents involving radiation or radioactive materials,
- engage in some preplanning to deal with issues related to identifying persons potentially affected by a radiological incident,
- consider how radionuclide contamination incidents can best be identified and controlled,
- help medical emergency response personnel understand their level of personal risk when caring for victims of radionuclide contamination,
- develop the laboratory capacity to allow the U.S. to respond rapidly and efficiently to a major radionuclide contamination incident, and
- engage in coordinated preplanning efforts with radiation control counterparts.

We need collectively to learn these lessons well and apply them appropriately as we plan and prepare for public health responses to radiation emergencies. Then, should a Litvinenko-like incident occur in the U.S., we can provide immediate and effective assistance to people. 🐼

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References

- Bailey, M.R., Birchall, A., Etherington, A., Fraser, G., Wilkins, B.T., Bessa, Y., Bishop, L., Brown, J., Dorrian, M.-D., Ewers, L.W., Fell, T.P., Ham, G.J., Hammond, D.J., Forrester, S., Hodgson, A., Howarth, C., Ibrahimi, Z.-F., Maguire, H., Marsh, J., Phipps, A.W., Puncher, M., Ruggles, R., Shutt, A., Smith, J.R.H., Turbitt, D., Youngman, M.J., & Wilding, D. (2010). *Individual monitoring conducted by the Health Protection Agency in the London Polonium-210 incident* (Report HPA-RPD-067). Chilton, Didcot, Oxfordshire, UK: Health Protection Agency.
- Brosh-Nissimov, T., Havkin, O., Davidovitch, N., Poles, L., & Shapira, C. (2008). Suspected radioactive contamination: Evaluation of 45 Israeli citizens potentially exposed to Polonium-210 in London. *The Israel Medical Association Journal*, 10(2), 99–103.
- Cornett, J., Tracy, B., Kramer, G., Whyte, J., Moodie, G., Auclair, J.P., & Thomson, D. (2009). Polonium-210: Lessons learned from the contamination of individual Canadians. *Radiation Protection Dosimetry*, 134(3–4), 164–166.
- Harrison, J., Leggett, R., Lloyd, D., Phipps, A., & Scott, B. (2007). Polonium-210 as a poison. *Journal of Radiological Protection*, 27(1), 17–40.
- Lewis, K. (2007, March). *Keeping the confidence of the public: Messages and media*. Paper presented at Polonium-210: The Public Health Response Conference, London.
- Lightfoot, N. (2007, March). *Lessons identified*. Paper presented at Polonium-210: The Public Health Response Conference, London.
- Perkins, A.C. (2007). The London polonium poisoning: Events and medical implications. *World Journal of Nuclear Medicine*, 6(2), 102–106.
- Roessler, G. (2007). Why ^{210}Po ? *Health Physics News*, XXXV(2), 1, 3–9.
- Rubin, G.J., Page, L., Morgan, O., Pinder, R.J., Riley, P., Hatch, S., Maguire, H., Catchpole, M., Simpson, J., & Wessely, S. (2007). Public information needs after the poisoning of Alexander Litvinenko with Polonium-210 in London: Cross sectional telephone survey and qualitative analysis. *BMJ*, 335(7630), 1143–1151.
- Santos, P.L., Gouvea, R.C., & Dutra, I.R. (1994). Concentrations of ^{210}Pb and ^{210}Po in hair and urine of workers, of the uranium mine at Pocos de Caldas (Brazil). *The Science of the Total Environment*, 148(1), 61–65.
- Scott, B.R. (2007). Health risk evaluations for ingestion exposure of humans to Polonium-210. *Dose-Response*, 5(2), 94–122.
- Smith, J.M., Ansari, A., & Harper, F. (2005). Hospital management of mass radiological casualties: Reassessing exposures from contaminated victims of an exploded radiological dispersal device. *Health Physics*, 89(5), 513–520.
- Specter, M. (1995, November 24). Chechen insurgents take their struggle to a Moscow park. *New York Times*. Retrieved from <http://www.nytimes.com/1995/11/24/world/chechen-insurgents-take-their-struggle-to-a-moscow-park.html?src=pm>
- U.S. Department of Health and Human Services. (2010). *Radiation emergency medical management: REMM*. Retrieved from http://www.remm.nlm.gov/ext_contamination.htm
- Volodarsky, B. (2009, December 2). Alexander Litvinenko: A very Russian poisoning. *The London Telegraph*. Retrieved from <http://www.telegraph.co.uk/news/worldnews/europe/russia/6615872/Alexander-Litvinenko-A-very-Russian-poisoning.html>

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▶ GUEST COMMENTARY



Burning Man, Extreme Environmental Health

Richard Elloyan, REHS
Nevada State Health Division

When it comes to celebrations and festivals of the strange and unusual the U.S. can certainly claim its fair share. Australia may have the Tuna Tossing Festival but we have the Great Wisconsin Cheese Festival. Thailand has the Monkey Buffet Festival but we have Frozen Dead Guy Days in Colorado. Spain has the Baby Jumping Festival and we counter with the Miss Crustacean Hermit Crab Beauty Contest. When it comes to celebrations designed to elevate the creative soul of the masses, however, nothing on this planet comes close to Burning Man.

Before you can truly understand why this festival is important on an environmental level—after all, that’s what we are interested in—you must have a sense of what Burning Man is as well as where Burning Man is. Neither is all that easy to put into words. The truth of the matter is you cannot simply describe Burning Man . . . you must experience it to understand it.

The true origins of Burning Man are the subject of much conjecture and myth but it’s safe to say that it began as a spontaneous act of erecting and igniting an effigy on a beach in San Francisco. A good fire always attracts a crowd, and as the yearly event began to attract more people than the beach could support, it eventually found its current home in the Black Rock Desert of Nevada, 100 miles north of Reno. The Black Rock Desert is home of the world land speed record and one of only a handful of places in the world where you can literally set your car on cruise control and go sit in the back seat and have a sandwich. It is big, it is flat, it is 1,000 square miles of dry lake bed, commonly known as the playa. It is the last place a clear-thinking human would want



The Burning Man statue, referred to as “the Man,” under construction. A new design for “the Man” is done every year.

to hold a festival. But sanity has never been a requirement for a festival!

The Burning Man “event” takes place for eight days at the end of August and early September. This year it will attract over 50,000 people, and as the week progresses it will for a time be one of the largest cities in the state of Nevada. It is billed as an experiment in radical self-expression and self-sufficiency. What that boils down to is almost anything goes and what you need to survive you must bring with you or do without. That means food, shelter, clothing (optional), and especially water. No grocery stores or showers or Home Depots are within 100 miles, nor is a source of potable drinking water. You are at the mercy of the wind, the heat, the cold, and the alkali whiteouts that may last for many hours. Once admitted to the event, you

must park your vehicle and you cannot drive around. With the exception of law enforcement almost all travel is by bicycle and you cannot leave the event unless you want to buy another \$400 ticket to get back in.

By 1999 the Burning Man event had grown in population to the point that it had become necessary for the state health division to establish and maintain a field office on site during the event. Heavy traffic on the two-lane road leading to the Black Rock Desert and the distance involved made commuting to the playa every day impractical. Each year, the health division rents a motor home so that staff have a home base from which to operate as well as much-needed air conditioning and shelter from frequent whiteouts. In 2003, the state of Nevada adopted Temporary Mass Gathering Regulations (Nevada Administrative Code 446.548), requiring the operator of a mass gathering to obtain a permit prior to the event. A mass gathering is described as “an outdoor assembly of not fewer than 500 persons that operates or may reasonably be expected to operate not less than 20 hours a day for more than 3 days and takes place at a location that lacks permanent facilities specifically intended for the type of assembly involved.” Permit fees are calculated on the daily attendance numbers and range from \$500 per day for 500 to 1,000 persons all the way up to \$1,500 per day for more than 10,000 persons. The event currently averages more than 10,000 persons per day for the entire length of the festival. The fees collected from the mass gathering permit as well as the temporary food permit fees help to defray the cost of over 300 man hours conducting inspections on site.

From an environmentalist’s perspective, the event presents a host of challenges that require



A typical Burning Man kitchen demonstrating a simple dishwashing sink set up.



Over 100 temporary food vendor permits were issued for the 2011 Burning Man event. This is an example of a sausage camp.



Artistic expression plays an important role in Burning Man, as seen in the Temple structure, which rises up from the bleak desert landscape.

Photos by Nevada State Health Division and Burning Man (www.burningman.com).

an entirely different approach. The goal remains the same—protecting the public health—but if you can imagine arguing with a naked man about the necessity of wearing food service gloves while he scoops ice for snow cones, you begin to see what we are up against.

In 2011, the Nevada State Health Division issued over 100 temporary food permits for vendors at Burning Man. That is significant when you keep in mind that nothing can be sold at the event. It must be given away. It also must be prepared on site in whatever facility, primitive or extensive, you can cart onto the playa and construct. The menu items for these temporary foods can range from solar popcorn to alligator kabobs. Black Rock City, the event site's temporary name, is a semicircle of concentric streets lined with endless tents, thousands of motor homes, and very few landmarks with which to keep your bearings. Even seasoned “burners” will admit to having been lost a time or two. Not only do we have to inspect each temporary food vendor that we permit, we also have to find them!

Besides enforcing our food code regulations, inspecting porta potties, and tracking down unpermitted food vendors, the state health division cooperates extensively with emergency medical services at the event to remain aware of any trends that might indicate a foodborne illness or norovirus outbreak. It is not difficult to imagine how swiftly an outbreak of this type could spread through a crowded tent city with no sanitation infrastructure. The effects would be crippling and could quickly overwhelm the available medical personnel. Health statistics are reported at daily meetings, any trends are noted, and follow-ups are conducted.

As you can imagine, a city of 50,000 people operating on a 24-hours-a-day schedule can

generate a significant amount of sewage and solid waste in eight days. Over 500 porta potties are on the playa, each requiring pumping several times a day. The state health division inspects and permits all septic pumpers operating at the event and as many as 25 trucks may be operating at any time. These range in size from 250-gallon trucks to 5,000-gallon tankers. All sewage is hauled to a waste treatment facility in Reno and trucks are constantly making the 200-mile round trip. Staff at the event may investigate sewage spills on the lake bed as well.

Interestingly enough, the success of Burning Man has forced the organizers of the event, Burning Man LLC, to create some of the very infrastructure that they were trying to get away from. Aside from the necessity of having environmental health staff at the event, they must also have Bureau of Land Management law enforcement as well as representatives from state department of transportation, local Native American tribes, state highway patrol, the Federal Aviation Administration (which maintains flight regulations for the temporary airport), Sierra Pacific Railway, and the county sheriff's department. Burning Man has also created a department of mutant vehicles to inspect the safety of art cars; a pyrotechnics group to maintain the safety of fires and explosive-themed events; the Black Rock Rangers to assist law enforcement; a department of public works that builds, maintains, and takes down the city; and a fire department.

Coordination and communication among all the regulators are handled by a special liaison team and daily briefings with all cooperating agencies are held. Emergency management plans are extensive and refined each year at pre- and post-cooperator meetings to determine what went right and what did not.

Discussions include getting thousands of attendees off the playa at the end of the event (known as exodus) and preparing and transporting large numbers of individuals long distances in the event of mass casualties due to disease, fire, or natural disaster. Surprisingly, one of the most feared events is rain. A rainfall event of any length brings all activity on the dry lake bed to a complete standstill. When the surface of the playa gets wet, it instantly turns into a material with the consistency of peanut butter, and you cannot walk on it, drive on it, and you certainly cannot ride a bicycle on it. The only option is to stay put and wait for it to dry out. Fortunately the only time this has happened was immediately after the event, stranding cleanup crews for several weeks.

The Nevada State Health Division staff remains on site of the Burning Man event for its entirety and rotates personnel throughout the event based on the number of volunteers available. It is a physically demanding job requiring meticulous planning, great communication skills, and an open mind. The best description I can think of is “extreme environmental health.”

Roswell, New Mexico, may have the UFO Festival, but if any actual aliens are living on this planet they will most likely be found at Burning Man . . . where they can blend in.

For a better understanding of the event please go to burningman.com or contact us here at the Nevada State Health Division (Health.nv.gov). 🚗

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The Impact of the Economic Downturn on Environmental Health Services and Professionals in North Carolina

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Abstract The objective of the authors' study was to examine the impact of the economic recession on the environmental health profession between budget year (BY) 2006–2007 and BY 2010–2011 in the following areas: (1) environmental health department fees for services; (2) changes in staffing levels, benefits, or pay; (3) changes in staff responsibilities; and (4) the impact to the private environmental sector compared to public environmental health professionals. Data were summarized from the following surveys: North Carolina Environmental Health Supervisors Association Fee and Economic Surveys; University of North Carolina Chapel Hill School of Government Current Salary Index; and a created online survey of private-sector environmental professionals. Total fees in the public sector for services have risen for most environmental health departments, but not enough to offset budget reductions. All of the counties that participated in the survey either have reduced staff, pay, or benefits due to budget cuts, and some counties utilized staff in other areas through cross-training. The private environmental sector also reduced staff in response to a reduced workload. Public sector employers may have difficulties retaining existing employees and recruiting new employees over the long term in the current economic climate.

Introduction

North Carolina, like other states, is grappling with historic budget deficits due to the current recession. North Carolina's unemployment was 10.6% in 2010, higher than the national rate of 9.6% (U.S. Bureau of Labor Statistics [USBLS], 2011a). County budgets for budget year (BY) 2010–2011 on average have seen an \$8 million decrease compared

to BY 2008–2009 (North Carolina Association of County Commissioners, 2010). The resulting economic conditions are forcing a shift in financial practices that may have a significant impact on how businesses and governments are run, including local environmental health departments (EHD) (Moore, Coddington, & Byrne, 2009). Over the past 10 years, many EHD nationwide

have seen little or no increase in their budgets, even as national and state economies grew (Resnick, Zablotsky, & Burke, 2009). Nationally, local public health agencies obtain an average of 44% of their funding from local government dollars, with 30% coming from the state government, 19% from fees, and 3% from direct federal dollars (Mays et al., 2004).

The current economic recession raises serious questions about the capacity of local EHD to fulfill state-mandated tasks while maintaining a competent workforce. Are counties raising permit fees to offset reductions in budgets? Have EHD reduced staff, benefits, or pay to meet budget cuts? Are staff being cross-trained in other program areas to offset loss of positions? What is the impact to the private environmental sector compared to public environmental health (EH) professionals? Information about these questions was pursued using data from the North Carolina Environmental Health Supervisors Association (NCEHSA) biannual fee survey and from data collected on the select counties for BY 2006–2007, BY 2008–2009, and BY 2010–2011 (NCEHSA, 2009). Additionally, a comparison of economic indicators was included in the analysis using the NCEHSA economic survey from 2009 and the survey of 2011, along with data from UNC Chapel Hill School of Government annual salary surveys for BY 2006–2007 and BY 2010–2011 (University of North Carolina at Chapel Hill School of Government [UNCCH], 2011).

TABLE 1

Environmental Health Department Permit Fee Changes

County	Fee Increases (\$)				Change (%)
	Onsite Waste-water System	Well	Pool	Total	
1	50	200	25	275	92
2	0	325	0	325	48
3	155	75	5	235	49
4	56	50	0	106	21
5	250	220	0	470	99
6	0	200	0	200	40
7	0	200	0	200	77
8	50	325	0	375	136
9	0	0	0	0	0
10	62	200	0	262	40
11	0	250	0	250	71
12	0	0	0	0	0
13	-50 ^a	350	50	350	175
14	0	325	0	325	48
15	50	125	0	175	31
16	0	170	125	295	40
17	0	0	0	0	0
18	0	85	0	85	24
19	50	50	0	100	22
20	0	45	0	45	14
21	0	100	25	125	36
22	0	170	0	170	25
23	0	0	0	0	0
24	0	325	0	325	48
Average	28	158	10	196	47

^aNegative value indicates reduction in fees.

Prior research on EH capacity focused on several aspects including salaries, benefits, funding of EH programs, retention of staff, and the impact of retirement. These studies included a nationwide survey of the status of EH professionals and a study on the protection of a skilled EH workforce (National Environmental Health Association, 2002; Resnick, Zablotzky, Janus, Maggy, & Burke, 2009). Our research utilized information specific to North Carolina in an attempt to understand the impact of the year 2008 economic downturn on EH professionals

statewide. A concern in our research has been the fact that local EHD are often the first responders to EH threats, bioterrorism threats, and other disasters, and that continued budget cuts to local programs may compromise the ability of these departments to respond to current and emerging EH issues.

Methods

A survey of 24 selected counties from across North Carolina was used to compare fees for services for BY 2006–2007 and BY 2010–2011 using the biannual NCEHSA data.

More specifically, fee data included onsite wastewater system (OSW) improvement permits, new well permits, and seasonal swimming pool permits. Additionally, data on EHD staffing levels, pay, and benefits were obtained and analyzed using the NCEHSA economic survey for 2009 and 2011. Public sector fees and staffing levels were compared to private entities that perform similar services. The counties were selected based on participation in both fee and economic surveys. Data from the private sector were obtained from firms that were randomly chosen from the members list of the North Carolina Board for Licensing of Soil Scientists (NCBLSS, 2011). Survey questions for the private sector were constructed to obtain information about changes in fees, changes in staffing levels, and changes in the duties of existing staff. These same questions were on the NCEHSA economic survey for 2009 and 2011.

The data for EHD fees were obtained from NCEHSA and from personal communications with EH supervisors in the surveyed counties. The economic survey from 2009 was also obtained from NCEHSA (2011). The 2011 economic survey was conducted using the same questions as the 2009 survey and was sent electronically through the NCEHSA LISTSERV as part of their biannual survey. The average salaries for EH specialists level I for BY 2006–2007 and BY 2010–2011 were obtained from UNC Chapel Hill School of Government (UNCCH, 2011).

Three key fees included in the study were OSW improvement permits, new well permits, and seasonal swimming pool permits. These fees were included because individual counties or health districts have the discretion to raise and lower these fees as their governing body allows, whereas some fees listed in the survey are set by state law (Public Health, 2007). An average value for the OSW improvement permits was calculated using the cost of the permits based on the number of bedrooms. Averaging the permit fee based on the number of bedrooms provided a representative sample of the dollar value for the permit. The new well permit fees and the seasonal swimming pool permit fees were compared per unit over time.

The average salaries of the EH staff in the selected counties for BY 2006–2007 were compared to BY 2010–2011 by calculating

the percentage increase or decrease. The percentage was then compared to the rate of change in the consumer price index (CPI) from 2006 to 2010 (USBLS, 2011b). Additional economic information was used to illustrate the impact of economic conditions on county budgets and residential development. Housing data were obtained from the U.S. Census Bureau's compilation of New Housing Units Authorized by Building Permits per state from 2006 through 2010 (U.S. Census Bureau, 2011).

Results

Fee Survey

The OSW improvement permit fees cost increased in eight of 24 (33%) EHD surveyed in a range from \$50 to \$250 (Table 1). Permit fees for OSW did not change for 63% of the surveyed EHD, and one EHD (4%) decreased fees by \$50 (Table 1). New well permit fees increased in 46% of EHD in a range from \$50 to \$220. New well permit fees remained steady for 29% of EHD, and no EHD decreased rates. Six EHD (25%) implemented new well permit fees ranging from \$200 to \$350 where previously no charge existed (Table 1). The seasonal swimming pool permit fees increased from \$25 to \$50 in 17% of surveyed EHD, while 83% did not change fee costs. No EHD decreased rates for seasonal swimming pool permit fees during the study period (Table 1). The combined fees for all permits (OSW, wells, and pools) increased for 83% of the counties, by an average of 47% between 2006–2007 and 2010–2011 (Table 1), a rate much higher than the CPI during that time span at 7.8% (USBLS, 2011b).

Staffing and Salary

Nineteen of the 24 EHD had salary data for BY 2006–2007 and BY 2010–2011. Fifteen EHD had an increase in the average pay between 2006 and 2010 above the CPI of 7.8% (USBLS, 2011). This is due in part to an increase in entry level pay and reclassification of EHD positions. The increase in salary ranged from 8.6% to 29.7% (Table 2). Two counties had increases below the CPI with one county increasing by 3% and the other county increasing by 5.9%. Two counties had decreases in the average salaries with one county dropping by 5.5% and the other by 7.6% (Table 2).

TABLE 2

Average Salaries of Environmental Health Specialist Level I With Raises and Benefit Data

County	Average Pay, 2006 (\$)	Average Pay, 2010 (\$)	Change (%)	Raise	Loss of Benefits	Furloughs
1	36,312	45,187	24	N	Y	Y
3	33,237	38,247	15.1	N	N	N
5	40,815	45,123	10.5	Y	Y	N
6	39,303	42,883	9.1	N	Y	N
7	36,944	44,033	19.1	N	N	N
8	38,270	44,920	17	UNK ^a	N	N
9	44,863	47,551	5.9	N	N	N
10	36,863	34,832	-5.5	N	Y	N
11	39,329	48,928	24.4	N	Y	N
12	39,523	51,263	29.7	N	N	N
13	33,538	37,754	12.5	N	UNK	N
15	40,583	46,862	15.5	No COLA ^b	N	N
16	47,539	48,936	3	N	N	N
17	41,148	47,690	15.8	N	Y	N
18	39,313	45,069	14.6	N	Y	N
20	39,024	36,048	-7.6	N	N	N
21	33,000	40,170	21.7	N	N	N
22	42,678	46,384	8.6	N	Y	N
23	38,622	44,437	15	N	N	N
Average	38,995	44,017	13			

^aUnknown.
^bCost of living adjustment.

Just over 62% of EHD had a decrease in staffing levels with the loss of staff ranging from one to 16 positions. Two of the EHD (8%) had an increase in EH staff, with one county adding two positions and the other county adding one position. No differences in staffing levels occurred between the two budget years for 29% of EHD. Overall, for the 24 counties, 45 positions were lost. Nearly 67% of EHD utilized existing personnel by changing their duties, while 33% did not change the duties of personnel. An example of a change in duties would be to cross-train an employee who was performing soil evaluation to perform swimming pool inspections. In 2010–2011 all EHD instituted one or all of the following: no merit raises or cost of living increases, furloughs, benefit reductions (i.e., eliminating 401(k) match, higher health insurance premiums, elimination of longevity, and reduced benefits for new hires) (Table 2). Fifteen of 24 counties (62.5%) had budget

reductions in 2010–2011 relative to the previous year or 2006–2007.

Private Sector

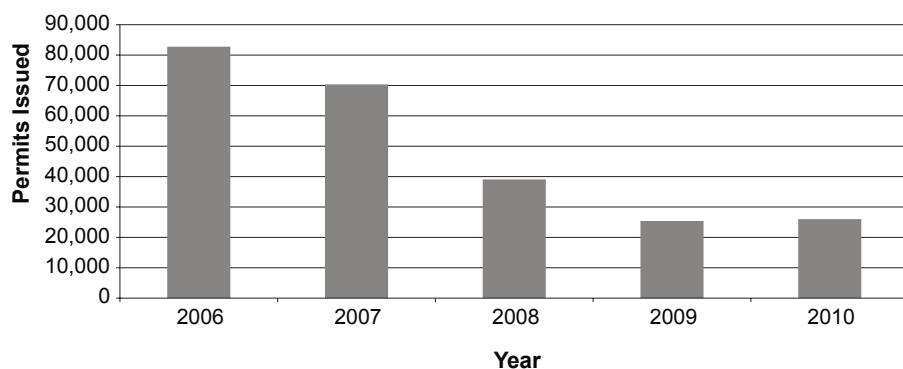
Eighteen electronic surveys were sent to private firms that performed soil testing similar to the duties of an EH specialist. Nine of 18 firms (50%) responded to the survey. Nearly 67% of private firms decreased their fees from 2006 to 2010 (Table 3). The reduction in fees ranged from 10% to 70% (Table 3). No firms increased their fees, and the fees remained the same for 33% (Table 3). Staffing levels in nearly 78% of the private firms decreased, for 22% of firms staffing levels stayed the same, and no firms added employees (Table 3). Responsibilities for existing private-firm staff changed for 33% of private firms during the recession, while 67% of firms the staff duties remained the same (Table 3). New home construction decreased by 68.5% between 2006 and 2010 (Figure 1) (U.S. Census Bureau, 2011).

TABLE 3

Private Sector Survey

Company	2006 Staff (#)	2010 Staff (#)	Change Fees (%)	Change Duties
A	34	20	-10	Y
B	9	2	-11	N
C	10	2	0	Y
D	70	16	-25	N
E	32	21	-10 to 15	Y
F	4	2	0	N
G	1	1	-70	N
H	1	1	0	N
I	2	1	-10	N
Average	18	7	-16	-

FIGURE 1

Building Permits Issued, North Carolina 2006–2010**Discussion**

EH services are often classified as public goods that impact entire communities and are not considered an individual service (Keane, Marx, & Ricci, 2002). These services at the local level are shaped by the most basic resources that are available, which are funding and personnel (Mays et al., 2006). State and local governments are now facing some of the largest declines in revenue in modern history with projections of smaller budgets for the next four to five years (Fox, 2010). The survey results in our study indicated that the public sector fee increases were not sufficient to offset the budget cuts and loss of revenue most EHD experienced, most often resulting in the loss of staff or staff benefits. Research has shown that adequate funding is

needed for a strong public health system and that increased spending at the local level is associated with a higher level of performance (Mays et al., 2006).

The fees for new well permits increased at a much higher rate than other fees. This was more than likely due to a new mandate by the state requiring the inspection of well installations and collection of well water samples by EHD for water quality analyses (Permitting, Inspection, and Testing of Private Drinking Water Wells, 2010). This requirement prompted many counties to start charging for new well permits due to the added workload. The revenue generated by the new well permit fees and increased fees for other services was not enough, however, to prevent the loss of staff or staff

benefits from most counties (Table 2). The revenue from new septic permits is largely dependent upon new home construction. A decrease occurred in new construction by 68.5% from 2006 to 2010 in North Carolina, which greatly affected the public and private sectors (U.S. Census Bureau, 2011) (Figure 1). The public sector raised existing fees and added new fees to help generate revenue. Fees in the private sector were lowered by as much as 70%, possibly in an attempt to become more competitive for available work. Both sectors, however, experienced loss of staff or benefits, despite the different strategies.

Nationally, almost a quarter of local health departments have privatized at least one EH service; the two most common reasons given are cost savings and lack of expertise to carry out services within the department (Keane et al., 2002). As local EHD in North Carolina continue to struggle with decreasing budgets, some services may be privatized, which would significantly weaken the local public health agency's ability to respond to an EH crisis by impairing communications and limiting enforcement capacity, along with jeopardizing the entire EH permitting process (Keane et al., 2002). Furthermore, over half of the local EHD and private firms were utilizing staff in other areas outside their previous responsibilities. With little or no funding allocated towards training and development of job skills, the quality of service may decrease until employees reach a level of comfort with their new responsibilities (Lichtveld & Cioffi, 2003).

In the public sector, many of the job losses came from retirement or elimination of previously frozen positions. These actions minimized the loss of currently employed EH specialists, but recruitment of new EH professionals essentially ceased (NCEHSA, 2011). EH professionals have chronically been underpaid for their education level and required certification as compared to secondary school teachers and emergency management specialists (Resnick et al., 2009). While EHD salaries increased during the study period, actual take-home pay remained the same or decreased due to furloughs or reductions in benefits. Therefore, though overall compensation for public sector EH professionals remained relatively stable, it still lagged behind other professions

with similar educational backgrounds and credentialing requirements. Recruitment of new professionals to the EH field will certainly suffer if the educational requirements and certifications expected of the recruits do not match pay and benefits relative to other fields (Resnick et al., 2009).

Our study only reviewed salary for the EH level I position. The cost of benefits was not included in these figures. Further research into the long-term effects of EH pay and benefits are needed to understand the full impact current conditions have on the profession.

Conclusion

EH professionals were greatly impacted by the recent economic downturn. Fees in several key areas were not increased enough to completely offset budget cuts. Private firms and the public sector lost staff. Salaries in most of the counties surveyed kept up with the increase in CPI; however, many counties instituted temporary cuts in pay that effectively reduced net income. Many counties eliminated raises or reduced benefits, all of which will hurt the profession in the long run. As government moves toward a more measurable or outcome-based model, it will be critical to determine how this may affect EHD and where changes can be made without impacting core

EH principles (Resnick et al., 2009). Public leaders must place a priority on staff retention and development in order to keep a workforce that can manage the shifting workload with the professionalism and education needed (Lichtveld & Cioffi, 2003). Staffing recruitment and retention will be a key component in providing an effective and efficient EH workforce that is able to serve the public in any continuing or emerging EH crisis. 🐼

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References

- Fox, W.F. (2010). *State budgets remain very tight even as the recovery begins*. Retrieved from <http://knowledgecenter.csg.org/drupal/system/files/fox.pdf>
- Keane, C., Marx, J., & Ricci, E. (2002). The privatization of environmental health services: A national survey of practices and perspectives in local health departments. *Public Health Reports*, 117(1), 62–69.
- Lichtveld, M.Y., & Cioffi, J.P. (2003). Public health workforce development: Progress, challenges and opportunities. *Journal of Public Health Management and Practice*, 9(6), 443–450.
- Mays, G.P., McHugh, M.C., Shim, K., Lenaway, D., Halverson, P.K., Moonesinghe, R., & Honore, P. (2004). Getting what you pay for: Public health spending and the performance of essential public health services. *Journal of Public Health Management and Practice*, 10(5), 435–443.
- Mays, G.P., McHugh, M.C., Shim, K., Perry, N., Lenaway, D., Halverson, P.K., & Moonesinghe, R. (2006). Institutional and economic determinants of public health system performance. *American Journal of Public Health*, 96(3), 523–531.
- Moore, K., Coddington, D., & Byrne, D. (2009). The long view: How the financial downturn will change health care. *Healthcare financial management: Journal of the Healthcare Financial Management Association*, 63(1), 56–65.
- National Environmental Health Association. (2002). Glimpses into NEHA's 2002 nationwide salary and benefits survey of local/county environmental health professionals. *Journal of Environmental Health*, 64(8), 20–22.
- North Carolina Association of County Commissioners. (2010). *Budget and tax survey*. Retrieved from <http://www.ncacc.org/budtax.htm>
- North Carolina Board for Licensing of Soil Scientists. (2011). *Soil science directory of active members*. Retrieved from <http://www.ncblss.org>
- North Carolina Environmental Health Supervisors Association. (2009). *Environmental health statewide fee and economic survey*. Retrieved from <http://www.ncehsa.org>
- Permitting, Inspection, and Testing of Private Drinking Water Wells (North Carolina General Statutes), GS §87–97 (2010). Retrieved from <http://www.ncga.state.nc.us/gascripts/statutes/statutelookup.pl?statute=87-97>
- Public Health (North Carolina General Statutes), GS §130A (2007). Retrieved from <http://www.ncga.state.nc.us/enactedlegislation/statutes/html/bychapter/chapter/130a.html>
- Resnick, B.A., Zablotsky, J., & Burke, T.A. (2009). Protecting and promoting the nation's health: The environmental public health workforce as a critical component. *Journal of Public Health Management and Practice*, 15(6 Suppl.), S40–S45.
- Resnick, B.A., Zablotsky, J., Janus, E.R., Maggy, B., & Burke, T.A. (2009). An examination of environmental public health organizational and workforce configurations in the northeast/mid-Atlantic United States: How do we determine if these configurations impact performance? *Journal of Public Health Management and Practice*, 15(6), 509–517.
- University of North Carolina at Chapel Hill School of Government. (2011). *County salary index*. Retrieved from <http://www.sog.unc.edu/pubs/electronicversions/csalindex.htm>
- U.S. Bureau of Labor Statistics. (2011a). *Regional and state unemployment, 2010 annual average summary*. Retrieved from www.bls.gov/news.release/srgune.nr0.htm
- U.S. Bureau of Labor Statistics. (2011b). *Consumer pricing index table*. Retrieved from <http://www.bls.gov/cpi>
- U.S. Census Bureau. (2011). *Housing units authorized by building permits*. Retrieved from <http://www.census.gov/const/C40/table2.html#annual>

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▶ INTERNATIONAL PERSPECTIVES

Food Safety Issues and Information Needs: An Online Survey of Public Health Inspectors

Although most of the information presented in the Journal refers to situations within the United States, environmental health and protection know no boundaries. The Journal periodically runs International Perspectives to ensure that issues relevant to our international constituency, representing over 60 countries worldwide, are addressed. Our goal is to raise diverse issues of interest to all our readers, irrespective of origin.

Abstract In the study described in this article, the authors investigated the perceptions and needs of public health inspectors (PHIs) in the province of Ontario, Canada, with regard to food safety issues and information resources. A cross-sectional online survey of 239 Ontario PHIs was conducted between April and June 2009. Questions pertained to their perceptions of key food safety issues and foodborne pathogens, knowledge confidence, available resources, and resource needs. All respondents rated time-temperature abuse, inadequate hand washing, and cross contamination as important food safety issues. *Salmonella*, *Campylobacter*, and *E. coli* O157:H7 were pathogens reported to be of concern to 95% of respondents (221/233). Most respondents indicated that they were confident in their knowledge of food safety issues and foodborne pathogens, but wanted a central, online resource for food safety information and ongoing food safety education training for PHIs. The data from the authors' study can be used in the development of information resources targeted to the needs of PHIs involved in food safety.

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Introduction

In recent years, a slow decline of meals prepared and consumed at home has occurred, with a shift to eating more food away from home (Agriculture and Agri-Food Canada, 2009). Between 1996 and 2001, food purchased from restaurants increased from 26.3% to 30.9% of the total weekly food expenditure per household in the province of Ontario, Canada (Statistics Canada, 2003). As a result of this shift, food service establishments have a greater potential to impact the health and safety of Ontarians. In a study investigating the distribution of foodborne disease cases and outbreaks reported in Ontario during a four-year period by risk setting, foods served from restaurants was found to be most frequently associated with outbreak-related foodborne illness (Isaacs, LeBer, & Michel, 1998).

Ontario has a population of over 12 million people (Statistics Canada, 2008) and is divided into 36 organizationally distinct health units that provide public health services and programs to the population within its geographic border (Capacity Review Committee, 2005). The Health Protection and Promotion Act (HPPA), R.S.O. 1990, c. H.7, is the legislation governing public health services in Ontario and provides public health inspectors (PHIs) "with broad powers to investigate and take, or order taken, any steps which are necessary to eliminate, or minimize, the effects of hazards to public health (Ontario Ministry of Agriculture, Food & Rural Affairs, 2008)."

The findings reported herein are part of a larger online survey that also investigated the perceptions and self-identified needs of PHIs in Ontario with regard to specialty foods (i.e., foods from different cultures)

and resources in different languages (Pham, Jones, Sargeant, Marshall, & Dewey, 2010a). The objective of this article was to identify and describe: 1) the key food safety issues of importance to PHIs, 2) the level of confidence PHIs have in their current food safety knowledge, 3) the format and types of food safety information resources that PHIs want, and 4) the topics PHIs would like to see in an educational workshop.

Materials and Methods

Study Design

A cross-sectional, online survey of Ontario PHIs was conducted from April to June 2009. The inclusion criteria for study participation required that participants have a Certificate in Public Health Inspection (Canada) and be employed at one of 36 Ontario health units.

TABLE 1

Demographic Characteristics of Online Survey Respondents (N = 239) and Comparison With Target Population^a

Characteristic	Study Population # (%)	Target Population ^b # (%)	p-Value (Overall Test)
Gender			
Male	111 (46.4)	—	—
Female	125 (52.3)	—	—
No response	3 (1.3)	—	—
Age group (years)			
18–29	49 (20.5)	—	—
30–39	74 (30.9)	—	—
40–49	62 (25.9)	—	—
50–59	43 (17.9)	—	—
≥60	9 (3.8)	—	—
Prefer not to answer	2 (0.8)	—	—
Number of years as a PHI^c			
0–1.9	26 (10.9)	—	—
2–4.9	43 (17.9)	—	—
5–9.9	58 (24.3)	—	—
10–19.9	44 (18.4)	—	—
≥20	68 (28.5)	—	—
Region			
Northwest	11 (4.7)	21 (2.3)*	<.0001
Northeast	16 (6.9)	66 (7.3)	
Eastern	28 (12.1)	92 (10.2)	
Central east	65 (28.0)	437 (48.2)*	
Central west	66 (28.5)	169 (18.7)*	
Southwest	46 (19.8)	121 (13.4)*	

^aTarget population = Ontario public health inspectors. Where data were available (N = 239).
^bTarget population data obtained through personal communication with Ontario health units.
^cPHI = public health inspector.
*Count in that subcategory was significantly different ($\chi^2 > 3.84$, $p < .05$) between study and target population.

Participants were informed that participation in the survey was voluntary, responses were confidential, and that completion of the survey served as informed consent. Our study received ethical approval from the research ethics board at the University of Guelph.

Questionnaire Development

The questionnaire design was developed by the researchers using information from the literature (Browne, 2005; Dillman, 2007; Vaillancourt, Martineau, Morrow, Marsh, & Robinson, 1991). The content of the questionnaire was based on data collected by the researchers from four focus groups conducted with PHIs from the central west

region of Ontario during June and July, 2008 (Pham, Jones, Sargeant, Marshall, & Dewey, 2010b). The questionnaire consisted mainly of closed-ended and semi-open-ended questions (i.e., included an “Other, please specify” option in the response choices), which included checklists, ranking questions, two-choice/multiple-choice questions, and Likert scales. The questionnaire went through a series of five draft iterations; revisions were based on reviews by the authors and pretesting with a PHI.

Survey Methodology

The online survey software tool SurveyMonkey was used for administering the

questionnaire and for data collection. Survey recruitment and correspondence was administered through the Canadian Institute for Public Health Inspectors (CIPHI) Ontario branch e-mail LISTSERV; CIPHI Ontario is a provincial branch of CIPHI, the national professional association that represents PHIs in Canada. Potential participants were notified of the survey and its purposes one week prior to the implementation of the survey. On the start date of the survey, an invitation to participate in the survey was sent to all potential participants with a URL link to the questionnaire on the SurveyMonkey Web site. Two follow-up notices were sent two weeks apart. An incentive was offered to promote survey participation: in all correspondences, potential participants were informed that participation in the survey would make them eligible to be entered in a drawing for one of three \$250 cash prizes.

Data Analyses

Prior to data analyses, the survey data file was imported into Microsoft Excel 2004 for validation and coding. The data file was examined for patterns of missing data and implausible values. The data were then exported into STATA Version 11 for analyses. Descriptive statistics were calculated to summarize the data. Nominal data was described using frequencies and percentages. The representativeness of the study population to the total population of PHIs at Ontario health units was assessed by comparing the distributions of each population across six geographic regions in Ontario. Data on the regional distribution of Ontario PHIs were obtained by determining the number of PHIs at each health unit, and then grouping these data to determine the number of PHIs working within each region. Comparisons between geographic regions were performed using Chi squared analyses. Differences were considered statistically significant at a level of $p < .05$.

Results

Study Population

A total of 256 individuals completed the online survey. Seventeen individuals did not meet the inclusion criteria and were excluded from analyses and calculation of the response rate. Approximately 875 individuals were registered on the LISTSERV, resulting in a survey response

TABLE 2

Online Survey Respondents' Ratings of the Level of Importance That Various Issues Have on Food Safety

Issue	Very Important # (%)	Important # (%)	Neither Important nor Unimportant # (%)	Unimportant # (%)	Very Unimportant # (%)	Don't Know/ No Opinion # (%)
Time-temperature abuse (n = 239)	225 (94.1)	14 (5.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Cross contamination (n = 239)	227 (94.9)	12 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Inadequate hand washing (n = 238)	209 (87.8)	29 (12.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Personal hygiene of food handlers (n = 238)	134 (56.3)	96 (40.3)	8 (3.4)	0 (0.0)	0 (0.0)	0 (0.0)
Poor general housekeeping (n = 239)	24 (10.0)	185 (77.4)	28 (11.7)	2 (0.8)	0 (0.0)	0 (0.0)
Inadequate sanitizing (n = 237)	117 (49.4)	111 (46.8)	9 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)
Vermin and food pests (n = 238)	99 (41.6)	131 (55.0)	7 (2.9)	1 (0.4)	0 (0.0)	0 (0.0)
Food from unapproved sources (n = 239)	125 (52.3)	103 (43.1)	10 (4.2)	1 (0.4)	0 (0.0)	0 (0.0)
Specialty foods (n = 238)	22 (9.2)	100 (42.0)	99 (41.6)	13 (5.5)	3 (1.3)	1 (0.4)
Improper food storage (n = 239)	85 (35.6)	139 (58.2)	15 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)
Lack of food safety knowledge by food handlers (n = 239)	164 (68.6)	66 (27.6)	9 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)

rate of 27.3% (239/875). Some questions were not answered by all respondents; hence, some analyses were conducted with smaller sample sizes, as noted in the tables. The demographic characteristics of respondents and available information for the target population (all Ontario PHIs) are listed in Table 1. Overall, the regional distribution of the study population was significantly different from that of the target population ($df = 5, \chi^2 = 47.2, p < .0001$), with overrepresentation in one region and underrepresentation in three regions.

Key Food Safety Issues

From a list provided in the survey, respondents were asked to rate how important they considered various issues in terms of food safety (Table 2). All respondents rated time-temperature abuse, cross contamination, and inadequate hand washing as either “very important” or “important” issues. The remaining issues listed were rated as “very important” or “important” by the majority of respondents (87%–97%); the only exception was with specialty foods (i.e., foods from different

cultures), where 51% of respondents rated the issue as “very important”/“important,” and 42% of respondents rated it as “neither important nor unimportant” in terms of food safety.

Respondents indicated their level of confidence in their current knowledge of various food safety issues (Table 3). Many respondents were “very confident” in their knowledge of time-temperature abuse (83.9%), cross contamination (87.7%), and proper hand washing (91.1%). With regard to specialty foods, 8.0% of respondents (19/237) reported being “very confident” in their knowledge, while 26% of respondents (62/237) reported being “unconfident” or “very unconfident.”

Key Food Pathogens

Respondents were asked to indicate their level of concern about various food pathogens in public health (Table 4). Most respondents reported being “very concerned” or “concerned” with *Salmonella* (98.3%), *Campylobacter* (95.4%), and *E. coli* O157:H7 (99.2%).

Respondents indicated their level of confidence in their current knowledge of food

pathogens (Table 5). Most respondents were “very confident” or “confident” in their knowledge of the pathogens listed.

Food Safety Resources

Respondents were asked how likely they would be to access a variety of resources if in need of food safety information (Table 6). Approximately 97.5% of respondents reported being “very likely” or “somewhat likely” to contact another PHI. The second resource most likely to be used was a government Web site. Conversely, the two resources that respondents indicated they were “somewhat unlikely” or “very unlikely” to access were an unofficial Web site (68.5%) and an industry Web site (50.0%).

Respondents were asked to rank (in order of importance) the three resources they would most prefer to access if in need of food safety information. The top three resources reported by respondents were: government Web sites (83.5%), another PHI (66.9%), and in-house resources (44.8%).

TABLE 3

Online Survey Respondents' Level of Confidence in Their Knowledge of Food Safety Issues

Issue	Very Confident # (%)	Confident # (%)	Neither Confident nor Unconfident # (%)	Unconfident # (%)	Very Unconfident # (%)	Don't Know/ No Opinion # (%)
Time-temperature abuse (n = 237)	199 (83.9)	36 (15.2)	1 (0.4)	1 (0.4)	0 (0.0)	0 (0.0)
Cross contamination (n = 236)	207 (87.7)	29 (12.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Proper hand washing (n = 235)	214 (91.1)	20 (8.5)	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Cleaning and sanitizing of utensils and equipment (n = 237)	170 (71.7)	61 (25.7)	4 (1.7)	2 (0.8)	0 (0.0)	0 (0.0)
Vermin and food pests (n = 234)	118 (50.4)	96 (41.0)	17 (7.3)	3 (1.3)	0 (0.0)	0 (0.0)
Specialty foods (n = 237)	19 (8.0)	64 (27.0)	90 (37.9)	52 (21.9)	10 (4.2)	2 (0.8)
Approved sources for food (n = 237)	67 (28.3)	107 (45.1)	44 (18.6)	17 (7.2)	2 (0.8)	0 (0.0)
Proper storage of food (n = 236)	163 (69.1)	69 (29.2)	2 (0.8)	2 (0.8)	0 (0.0)	0 (0.0)

Preferred Information Dissemination Methods

Nearly all respondents (99.2%) indicated that a computer with high-speed Internet connectivity was readily accessible to them at their workplace. Respondents were asked to judge to what extent they agreed or disagreed with the statement: "An online resource is a convenient way for me to obtain new food safety information"; 98.3% of respondents "strongly agreed" or "somewhat agreed" with this statement.

From a list of options, respondents were asked to select which option they considered to be the most effective medium for disseminating food safety information to PHIs. A Web site was the first choice among respondents with 43.3% of responses, followed by an e-mail newsletter (27.7%), workshop/seminar (18.9%), web seminar/webcast (7.6%), and teleconference (0.4%).

Respondents also indicated how useful they considered various information resources to be to them in their role as a PHI (Table 7). The majority of respondents (94.5%; 225/238) considered regular education time, seminars, or workshops for PHIs to be "very useful" (141/238) or "useful" (84/238). A large number of respondents reported that an e-mail newsletter (86.1%), an online clearinghouse for food safety information (84.8%), new food

safety videos (83.2%), regular meetings with inspectors from other inspection agencies (82.0%), and a layman's interpretation of the Food Premises Regulation (76.5%) would be "very useful" or "useful."

Food Safety Workshop

Approximately 90% of respondents (215/238) indicated that they would be interested in attending a workshop hosted by food safety researchers from the Centre for Public Health and Zoonoses (CPHAZ) and the University of Guelph. Given a list of topics, respondents were also asked to indicate whether they would be interested in seeing each topic covered at the workshop. Emerging food safety issues was the topic in which the most number of participants reported interest (98.6%), followed by specialty foods (95.8%), emerging foodborne pathogens (95.7%), issues with which other inspection agencies are currently involved (86.9%), recent cases of foodborne outbreaks and illnesses (81.9%), and case-based outbreak scenarios (78.7%).

Discussion**Study Population**

While the survey response rate was lower than anticipated (27.3%), the survey population

is estimated to represent approximately one-quarter of all PHIs at Ontario health units. The survey respondents also represented a wide range of geographic locations across the province. A higher proportion of PHIs from the central west region participated in the survey than expected. This may reflect the fact that PHIs from this area participated in the initial focus groups as well as the proximity of the University of Guelph to these health units.

Key Food Safety Issues and Pathogens

With regard to food safety issues of concern to public health, time-temperature abuse, cross contamination, and inadequate hand washing were reported to be either "important" or "very important" issues by all respondents. All three improper food-handling practices are among the "Fatal Five," or five major causes of foodborne illness outbreaks in food service establishments (University of Rhode Island Cooperative Extension Food Safety Education, 2000). The majority of respondents reported being "very concerned" or "concerned" about *Salmonella*, *Campylobacter*, and *E. coli* O157:H7 in terms of their risk to public health. These bacteria have been found to be the three leading causes of enteric illness reported in Ontario (Lee & Middleton, 2003).

TABLE 4

Online Survey Respondents' Level of Concern About Food Pathogens

Pathogen	Very Concerned # (%)	Concerned # (%)	Neither Concerned nor Unconcerned # (%)	Unconcerned # (%)	Very Unconcerned # (%)	Don't Know/ No Opinion # (%)
<i>Salmonella</i> (n = 235)	146 (62.1)	85 (36.2)	4 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)
<i>Campylobacter</i> (n = 237)	119 (50.2)	107 (45.1)	10 (4.2)	1 (0.4)	0 (0.0)	0 (0.0)
<i>E. coli</i> O157:H7 (n = 237)	184 (77.6)	51 (21.5)	2 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)
<i>Listeria monocytogenes</i> (n = 236)	109 (46.2)	94 (39.8)	27 (11.4)	5 (2.1)	1 (0.4)	0 (0.0)
<i>Clostridium botulinum</i> (n = 237)	107 (45.1)	103 (43.5)	19 (8.0)	8 (3.4)	0 (0.0)	0 (0.0)
<i>Clostridium perfringens</i> (n = 235)	94 (40.0)	118 (50.2)	20 (8.5)	2 (0.9)	0 (0.0)	1 (0.4)
Norovirus (n = 236)	85 (36.0)	116 (49.2)	30 (12.7)	3 (1.3)	1 (0.4)	1 (0.4)
Hepatitis A virus (n = 235)	120 (51.1)	95 (40.4)	19 (8.1)	1 (0.4)	0 (0.0)	0 (0.0)

Perceived Knowledge Confidence

The intent of our study was not to assess the level of food safety knowledge of the survey respondents, but to explore how confident they were in their current food safety knowledge and to identify any self-perceived knowledge gaps. The majority of respondents reported confidence in their knowledge about the food safety issues and foodborne pathogens listed in the survey. This confidence might be attributed to food safety comprising a large component of the work of many PHIs. Additionally, it is a significant part of the curriculum in the postsecondary education required to become a PHI in Canada and an area for which many resources are currently available. The only topic area where notably fewer respondents reported being confident in their knowledge was in specialty foods. As specialty foods have only recently become more commonplace, it is a subject area in which many inspectors may not have received training during their education and where adequate food safety information may not yet be available. Ongoing educational training on specialty foods may help PHIs gain knowledge confidence in this area.

Food Safety Resources

While participants were asked what they considered to be the key food safety issues and foodborne pathogens in public health, the survey did not ask whether participants were satisfied with the resources currently available for these topics. It is possible that participants

may have reported a need for new or additional resources on these key issues and pathogens had they been asked. For the most part, however, participants reported confidence in their current level of food safety knowledge.

Although a number of food safety information resources are currently available to PHIs, over three-quarters of respondents reported that they were “very likely” to seek information from fellow PHIs and government Web sites when in need of food safety information. Further, when asked to rank which resources they would most prefer to access for food safety information, government Web sites and PHIs were again most often ranked in respondents’ top three choices. With many respondents reporting that they considered fellow PHIs to be resources for food safety information, the importance of ongoing training and education for PHIs was highlighted. Ongoing educational training of PHIs would help ensure that up-to-date and reliable food safety information is shared among PHIs.

Preferred Information Dissemination Methods

Participants’ responses indicate that an online resource, such as an e-mail newsletter or online clearinghouse, would be an effective strategy to quickly and efficiently disseminate food safety information to PHIs. A resource such as an online clearinghouse (i.e., a web-based database) would provide PHIs with a central area to access food safety information from a variety

of sources. It would allow PHIs to search one resource for food safety information at their convenience, in a quick and efficient manner, and allow them to print information and resources as needed. An e-mail newsletter would also allow PHIs to keep up-to-date by alerting them to emerging issues or to the availability of new information or resources. The PHIs in our study reported being very likely to use such resources.

Respondents indicated their desire for ongoing food safety education and training by rating “regular education time, seminars, or workshops” as the resource most useful to them in their role as PHIs. Ongoing educational sessions for PHIs can be used to roll out new food safety information, provide training, distribute information resources, and also provide an opportunity for inspectors to come together, ask questions, and share experiences and insights. The other two resources in which respondents most considered “very useful” or “useful” to them were an e-mail newsletter and an online clearinghouse. These online resources can also be used to disseminate follow-up food safety information initially provided in the educational sessions.

Food Safety Workshop

While workshops and seminars were ranked third by respondents in terms of effectiveness for disseminating food safety information to PHIs, the majority of respondents still indicated that food safety education

TABLE 5

Online Survey Respondents' Level of Confidence in Their Knowledge of Food Pathogens

Pathogen	Very Confident # (%)	Confident # (%)	Neither Confident nor Unconfident # (%)	Unconfident # (%)	Very Unconfident # (%)	Don't Know/ No Opinion # (%)
<i>Salmonella</i> (n = 234)	126 (53.8)	96 (41.0)	11 (4.7)	1 (0.4)	0 (0.0)	0 (0.0)
<i>Campylobacter</i> (n = 237)	111 (46.8)	99 (41.8)	19 (8.0)	8 (3.4)	0 (0.0)	0 (0.0)
<i>E. coli</i> O157:H7 (n = 237)	125 (52.7)	103 (43.5)	9 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)
<i>Listeria monocytogenes</i> (n = 237)	99 (41.8)	109 (45.9)	23 (9.7)	6 (2.5)	0 (0.0)	0 (0.0)
<i>Clostridium botulinum</i> (n = 237)	96 (40.5)	115 (58.5)	21 (8.9)	5 (2.1)	0 (0.0)	0 (0.0)
<i>Clostridium perfringens</i> (n = 235)	85 (36.2)	106 (45.1)	31 (13.2)	12 (5.1)	1 (0.4)	0 (0.0)
Norovirus (n = 235)	96 (40.9)	101 (42.9)	29 (12.3)	8 (3.4)	1 (0.4)	0 (0.0)
Hepatitis A virus (n = 236)	94 (39.8)	102 (43.2)	29 (12.3)	11 (4.7)	0 (0.0)	0 (0.0)

TABLE 6

Likelihood of Online Survey Participants Accessing Various Resources If in Need of Food Safety Information

Resource	Very Likely # (%)	Somewhat Likely # (%)	Somewhat Unlikely # (%)	Very Unlikely # (%)	Resource Not Available to Me # (%)
Another public health inspector (n = 239)	191 (79.9)	42 (17.6)	4 (1.7)	1 (0.4)	1 (0.4)
In-house resource (n = 239)	166 (69.5)	51 (21.3)	14 (5.9)	6 (2.5)	2 (0.8)
Resource from another health unit (n = 238)	56 (23.5)	123 (51.7)	51 (21.4)	8 (3.4)	1 (0.4)
Journal article (n = 239)	56 (23.4)	105 (43.9)	68 (28.5)	9 (3.8)	1 (0.4)
Textbook/reference manual (n = 238)	108 (45.4)	84 (35.3)	40 (16.8)	5 (2.1)	1 (0.4)
Unofficial Web site (e.g., Google) (n = 238)	22 (9.2)	51 (21.4)	79 (33.2)	84 (35.3)	2 (0.8)
Government Web site (e.g., Health Canada) (n = 239)	182 (76.2)	49 (20.5)	6 (2.5)	2 (0.8)	0 (0.0)
Nongovernment Web site (e.g., Food Safety Network) (n = 238)	55 (23.1)	117 (49.2)	54 (22.7)	12 (5.0)	0 (0.0)
Industry Web site (e.g., Dairy Farmers of Ontario) (n = 238)	23 (9.7)	95 (39.9)	90 (37.8)	29 (12.2)	1 (0.4)

workshops and seminars for PHIs were of interest to them. Furthermore, participants' responses indicated that they would like new and emerging food safety topics to be the focus of workshops, with almost 95% of respondents reporting emerging food safety issues, specialty foods, and emerging food-borne pathogens as desired topics. Workshops and seminars could be utilized to roll out new food safety information to PHIs, with subsequent follow-up information disseminated through online resources, such as a Web site or e-mail newsletter.

Limitations

Participation bias may have been introduced because of the volunteer nature of our study. That is, the self-reported data reflect the perspectives only of PHIs who took or were able to take the opportunity to respond (e.g., PHIs with ready access to a computer with high-speed Internet access). Furthermore, the CIPHI Ontario LISTSERV includes only the e-mail addresses of PHIs who have registered on the e-mail list and is not inclusive of all Ontario PHIs. The proportion of the approximately 900 PHIs in Ontario

(Ministry of Health and Long-Term Care, personal communication, June 24, 2009) registered with the LISTSERV is unknown; however, it is thought that the majority of the approximately 875 individuals registered with the LISTSERV are Ontario PHIs (P. Heywood, personal communication, February 17, 2009).

Due to the lack of demographic data available to determine the representativeness of the study population, the extent to which the results may be generalized to other Canadian provinces and regions beyond may be limited.

TABLE 7

Online Survey Participants' Perceived Usefulness of Various Information Resources in Their Role as Public Health Inspectors

Resource	Very Useful # (%)	Useful # (%)	Neither Useful nor Useless # (%)	Useless # (%)	Very Useless # (%)	Don't Know/No Opinion # (%)
Regular education time/seminars/workshops for public health inspectors (n = 238)	141 (59.2)	84 (35.3)	7 (2.9)	3 (1.3)	3 (1.3)	0 (0.0)
E-mail newsletter (n = 238)	100 (42.0)	105 (44.1)	29 (12.2)	3 (1.3)	1 (0.4)	0 (0.0)
Online clearinghouse (i.e., web-based database for food safety information and resources) (n = 238)	121 (50.8)	81 (34.0)	32 (13.4)	3 (1.3)	0 (0.0)	1 (0.4)
Lay interpretation of the food safety regulations to distribute to food handlers and food premises operators (n = 238)	93 (39.1)	89 (37.4)	37 (15.5)	11 (4.6)	1 (0.4)	7 (2.9)
New food safety videos for use during the food handler training course (n = 238)	102 (42.9)	96 (40.3)	25 (10.5)	8 (3.4)	3 (1.3)	4 (1.7)
Regular meetings with inspectors from other inspection agencies (e.g., OMAFRA ^a , CFIA ^b) (n = 239)	77 (32.2)	119 (49.8)	36 (15.1)	5 (2.1)	1 (0.4)	1 (0.4)
Other ^c (n = 11)	7 (63.6)	1 (9.1)	3 (27.3)	0 (0.0)	0 (0.0)	0 (0.0)

^aOntario Ministry of Agriculture, Food, and Rural Affairs.

^bCanadian Food Inspection Agency.

^c“Other” resources listed by respondents: training in critical assessment, mandatory meetings or teleconferences with other health units to discuss food safety issues, a list of the types of food safety resources each health unit has available to share with others, a compilation of food safety memos issues by the Ministry of Health and Long-Term Care, and a forum for commercial businesses to show products relevant to food safety and public health.

Conclusion


Our study investigated the perceptions of PHIs in the province of Ontario, Canada. Respondents were generally confident in their current knowledge of key food safety issues and food-borne pathogens but were interested in additional food safety education resources nonetheless. Given that most PHIs are likely to have ready access to a computer with Internet connectivity, efforts should be made to develop online resources, such as an online clearinghouse, to disseminate food safety information to PHIs. Respondents reported the need for ongoing food safety education and training

for PHIs and indicated that they would like new and emerging food safety topics and issues to be the focus of an education workshop for PHIs. This understanding of the public health inspectors' perceptions, concerns, and self-identified needs will better enable the development of food safety information resources of direct relevance to this population. 🐷

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References

- Agriculture and Agri-Food Canada. (2009). *Canadian consumers*. Retrieved from <http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1170942402619&lang=eng>
- Browne, J. (2005). Questionnaire design. In J. Green & J. Browne (Eds.), *Principles of social research* (pp. 108–115). New York: Open University Press.
- Capacity Review Committee. (2005). *Revitalizing Ontario's public health capacity: A discussion of issues and options*. Retrieved from http://www.health.gov.on.ca/english/public/pub/ministry_reports/capacity_review05/capacity_review05.pdf
- Dillman, D.A. (2007). *Mail and Internet surveys: The tailored design, 2007 update* (2nd ed.). Etobicoke, Ontario, Canada: John Wiley & Sons.
- Isaacs, S., LeBer, C., & Michel, P. (1998). Distribution of foodborne disease by risk setting—Ontario. *Canada Communicable Disease Report*, 24(8), 1–2.
- Lee, M.B., & Middleton, D. (2003). Enteric illness in Ontario, Canada, from 1997 to 2001. *Journal of Food Protection*, 66(6), 953–961.
- Ontario Ministry of Agriculture, Food & Rural Affairs. (2008). *Government roles and responsibilities for food safety in Ontario: Municipal*. Retrieved from <http://www.omafra.gov.on.ca/english/infores/foodsafe/rolesmun.html>
- Pham, M.T., Jones, A.Q., Sargeant, J.M., Marshall, B.J., & Dewey, C.E. (2010a). Specialty food safety concerns and multilingual resource needs: An online survey of public health inspectors. *Foodborne Pathogens and Disease*, 7(12), 1457–1462.
- Pham, M.T., Jones, A.Q., Sargeant, J.M., Marshall, B.J., & Dewey, C.E. (2010b). A qualitative exploration of the perceptions and information needs of public health inspectors responsible for food safety. *BMC Public Health*, 10, 345.
- Statistics Canada. (2003). *Food expenditure in Canada 2001* (Catalogue No. 62-554-XIE). Retrieved from http://www.statcan.gc.ca/access_acces/archive.action?loc=/pub/62-554-x/62-554-x2001001-eng.pdf
- Statistics Canada. (2008). *2006 community profiles* (Catalogue No. 92-591-XWE). Retrieved from <http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=92-591-XWE&lang=eng>
- University of Rhode Island Cooperative Extension Food Safety Education. (2000). *Cause and prevention of foodborne illness*. Retrieved from <http://www.uri.edu/ce/ceec/food/factsheets/foodborneill.html>
- Vaillancourt, J.P., Martineau, G., Morrow, M., Marsh, W., & Robinson, A. (1991). Construction of questionnaires and their use in veterinary medicine. In M. Thrusfield (Ed.), *Proceedings of the Society for Veterinary Epidemiology and Preventive Medicine annual conference: 17–19 April 1991* (pp. 94–106). London: Society for Veterinary Epidemiology and Preventive Medicine.

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Prevention of Tick-Borne Diseases

Editor's Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

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The conclusions in this article are those of the author(s) and do not necessarily represent the views of the CDC.

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Lyme disease ranks among the top 10 notifiable infectious diseases in the U.S.; in 2009, state health departments reported 29,959 confirmed and 8,509 probable cases to the Centers for Disease Control and Prevention (CDC, 2010). The first line of defense in the effort to prevent Lyme disease

is personal protection (Piesman & Eisen, 2008). Educational efforts, however, such as promoting tick checks, avoiding tick infested habitat, and using repellents, have had only modest success in changing behavior or actually preventing Lyme disease (Connally et al., 2009; Gould et al., 2008). The nymphal stage

of the blacklegged tick, *Ixodes scapularis*, is the principal vector of the Lyme disease spirochete (*Borrelia burgdorferi sensu stricto*); it has been a focus of research on methods for tick control for prevention of Lyme disease. Some of the methods developed include the application of area-wide acaricides; applying acaricides to rodent hosts of immature ticks; and applying acaricides directly to deer, the principal hosts for the adult ticks. The least toxic agents for killing ticks include soaps and desiccants, fungi, and botanical extracts (reviewed in Piesman & Eisen, 2008). Vegetation management strategies can potentially reduce tick exposure (Schulze, Jordan, & Hung, 1995) as can eradication of deer (Rand, Lubelczyk, Holman, Lacombe, & Smith, 2004).

Despite a plethora of excellent academic research on tick control, however, the public has been slow to adopt any of these methods on a wide scale. One potential hurdle to tick control at a community level is the fact that unlike mosquito control, where mosquito abatement districts receive public funding, tick control is basically an individual homeowner or homeowner association responsibility. The amount of money individual homeowners are willing to spend on tick control, even in highly endemic Lyme disease regions, is extremely limited (Gould et al., 2008).

Targeting the pathogen within the natural reservoir or vector holds promise. Vaccines directed against the outer surface protein A (OspA) of *B. burgdorferi* have been applied to rodents either via direct inoculation (Tsao et al., 2004) or as baits containing spirochetal OspA (Meirelles Richer,

Aroso, Contente-Cuomo, Ivanova, & Gomes-Solecki, 2011). Moreover, rodent-targeted baits containing antibiotics that clear rodents and ticks of spirochetes have also been tested in the lab and the field (Dolan et al., 2011). None of these pathogen-targeted ecological approaches is to the stage yet where commercial products are available for testing.

Human-targeted approaches to blocking transmission of the Lyme disease spirochete include vaccines and antibiotic prophylaxis. An effort toward developing an OspA recombinant protein for deployment as a human vaccine was successful. Two vaccine candidates were tested in clinical trials in both North America (Sigal et al., 1998; Steere et al., 1998) and Europe (Beran, De Clercq, Dieussaert, & Van Hoecke, 2000), and a commercial vaccine became available in 1999. Although this vaccine was effective (Steere et al., 1998) and surveillance did not demonstrate adverse events tied to the vaccine (Lathrop et al., 2002), the vaccine was withdrawn from the market in 2002. The principal reason for withdrawal of

the vaccine was lack of market success; however, public perceptions about the safety of the vaccine may have contributed to its withdrawal (Shen, Mead, & Beard, 2011). Antibiotic prophylactic treatment of tick bite can potentially play an important role as a method to prevent *B. burgdorferi* transmission. A large clinical trial in Westchester County, New York, an area highly endemic for Lyme disease, examined patients that had an *I. scapularis* tick removed within 72 hours of entering the trial (Nadelman et al., 2001). The efficacy of doxycycline prophylaxis was judged to be 87%, but how widely physicians practice this method is presently unknown. Thus, many approaches are available for preventing Lyme disease, but the incidence nevertheless continues to climb.

Looking forward, what is needed most is an integrated approach to Lyme disease prevention. Ecology, entomology, and epidemiology must be combined to design studies on what works in the real world to significantly reduce the incidence of Lyme disease in highly endemic communities. Toward that end, a

network has been established by CDC and state health departments; this network, called TickNET, is currently conducting a multistate trial to determine whether barrier acaricide sprays on residential properties are effective in decreasing the incidence of Lyme disease in highly endemic regions of the northeastern U.S. This project may hopefully become a model for future studies on the efficacy of prevention methods for tick-borne diseases in the U.S., such as Lyme disease, human babesiosis, human anaplasmosis, Rocky Mountain spotted fever, human ehrlichiosis, tick-borne relapsing fever, Powassan encephalitis, and Colorado tick fever. 🐞

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References

- Beran, J., De Clercq, N., Dieussaert, I., & Van Hoecke, C. (2000). Reactogenicity and immunogenicity of a Lyme disease vaccine in children 2–5 years old. *Clinical Infectious Diseases*, 31(6), 1504–1507.
- Centers for Disease Control and Prevention. (2010). Notice to readers: Final 2009 reports of nationally notifiable infectious diseases. *Morbidity and Mortality Weekly Report*, 59(32), 1025–1039.
- Connally, N.P., Durante, A.J., Yousey-Hindes, K.M., Meek, J.I., Nelson, R.S., & Heimer, R. (2009). Peridomestic Lyme disease prevention: Results of a population-based case-control study. *American Journal of Preventive Medicine*, 37(3), 201–206.
- Dolan, M.C., Schulze, T.L., Jordan, R.A., Dietrich, G., Schulze, C.J., Hojgaard, A., Ullmann, A.J., Sackal, C., Zeidner, N.S., & Piesman, J. (2011). Elimination of *Borrelia burgdorferi* and *Anaplasma phagocytophilum* in rodent reservoirs and *Ixodes scapularis* ticks using a doxycycline hyclate-laden bait. *American Journal of Tropical Medicine and Hygiene*, 85(6), 1114–1120.
- Gould, L.H., Nelson, R.S., Griffith, K.S., Hayes, E.B., Piesman, J., Mead, P.S., & Cartter, M.L. (2008). Knowledge, attitudes, and behaviors regarding Lyme disease prevention among Connecticut residents, 1999–2004. *Vector-Borne and Zoonotic Diseases*, 8(6), 769–776.
- Lathrop, S.L., Ball, R., Haber, P., Mootrey, G.T., Braun, M.M., Shadomy, S.V., Ellenberg, S.S., Chen, R.T., & Hayes, E.B. (2002). Adverse event reports following vaccination for Lyme disease: December 1998–July 2000. *Vaccine*, 20(11–12), 1603–1608.
- Meirelles Richer, L., Aroso, M., Contente-Cuomo, T., Ivanova, L., & Gomes-Solecki, M. (2011). Reservoir targeted vaccine for Lyme borreliosis induces a year long, neutralizing antibody response to OspA in white-footed mice. *Clinical and Vaccine Immunology*, 18(11), 1809–1816.
- Nadelman, R.B., Nowakowski, J., Fish, D., Falco, R.C., Freeman, K., McKenna, D., Welch, P., Marcus, R., Agüero-Rosenfeld, M.E., Dennis, D.T., & Wormser, G.P. (2001). Prophylaxis with single-dose doxycycline for the prevention of Lyme disease after an *Ixodes scapularis* tick bite. *The New England Journal of Medicine*, 345(2), 79–84.
- Piesman, J., & Eisen, L. (2008). Prevention of tick-borne diseases. *Annual Review of Entomology*, 53, 323–343.
- Rand, P.W., Lubelczyk, C., Holman, M.S., Lacombe, E.H., & Smith, R.P., Jr. (2004). Abundance of *Ixodes scapularis* (Acari: Ixodidae) after the complete removal of deer from an isolated offshore island, endemic for Lyme disease. *Journal of Medical Entomology*, 41(4), 779–784.
- Schulze, T.L., Jordan, R.A., & Hung, R.W. (1995). Suppression of subadult *Ixodes scapularis* (Acari: Ixodidae) following removal of leaf litter. *Journal of Medical Entomology*, 32(5), 730–733.
- Shen, A.K., Mead, P.S., & Beard, C.B. (2011). The Lyme disease vaccine—a public health perspective. *Clinical Infectious Diseases*, 52(Suppl. 3), S247–S252.

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References *continued from page 31*

Sigal, L.H., Zahradnik, J.M., Lavin, P., Patella, S.J., Bryant, G., Haselby, R., Hilton, E., Kunkel, M., Adler-Klein, D., Doherty, T., Evans, J., Molloy, P.J., Seidner, A.L., Sabetta, J.R., Simon, H.J., Klempner, M.S., Mays, J., Marks, D., & Malawista, S.E. (1998). A vaccine consisting of recombinant *Borrelia burgdorferi* outer-surface protein A to prevent Lyme disease. Recombinant outer-surface-protein A Lyme disease vaccine study consortium. *The New England Journal of Medicine*, 339(4), 216–222.

Steere, A.C., Sikand, V.K., Meurice, F., Parenti, D., Fikrig, E., Schoen, R.T., Nowakowski, J., Schmid, C.H., Laukamp, S., Buscarino, C., & Krause, D.S. (1998). Vaccination against Lyme disease with

recombinant *Borrelia burgdorferi* outer surface lipoprotein A with adjuvant. Lyme disease vaccine study group. *The New England Journal of Medicine*, 339(4), 209–215.

Tsao, J.I., Wootton, J.T., Bunikis, J., Luna, M.G., Fish, D., & Barbour, A.G. (2004). An ecological approach to preventing human infection: Vaccinating wild mouse reservoirs intervenes in the Lyme disease cycle. *Proceedings of the National Academy of Sciences of the United States of America*, 101(52), 18159–18164.

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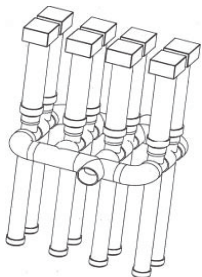
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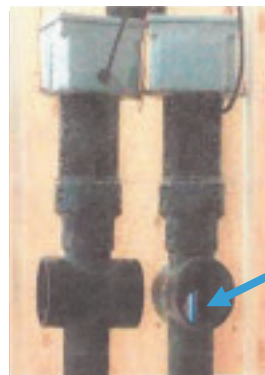
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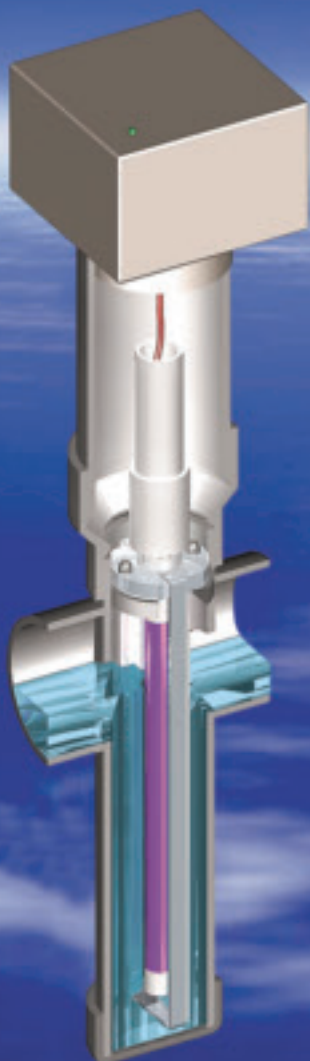
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▶ DEMYSTIFYING THE FUTURE



Thomas Frey

Two Billion Jobs to Disappear by 2030

Editor's Note: Significant and fast-paced change is occurring across society in general and our profession in particular. With so much confusion in the air, NEHA is looking for a way to help our profession better understand what the future is likely to look like. The clearer our sense for the future is, the more able we are to both understand and take advantage of trends working their way through virtually every aspect of our lives today. To help us see what these trends are and where they appear to be taking us, NEHA has made arrangements to publish the critical thinking of the highly regarded futurist, Thomas Frey.

The opinions expressed in this column are solely that of the author and do not in any way reflect the policies and positions of NEHA and the *Journal of Environmental Health*.

Thomas Frey is Google's top-rated futurist speaker and the executive director of the DaVinci Institute®. At the Institute, he has developed original research studies enabling him to speak on unusual topics, translating trends into unique opportunities. Frey continually pushes the envelope of understanding, creating fascinating images of the world to come. His talks on futurist topics have captivated people ranging from high-level government officials to executives in Fortune 500 companies. He will be the keynote speaker at the NEHA 2012 AEC. He has also authored the book *Communicating with the Future*. Frey is a powerful visionary who is revolutionizing our thinking about the future.

Earlier this year I was honored to be one of the featured speakers at the TEDxReset Conference in Istanbul, Turkey, where I predicted that over two billion jobs will disappear by 2030. Since my 18-minute talk was about the rapidly shifting nature of colleges and higher education, I didn't have time to explain how and why so many jobs would be going away. Because of all of the questions I received afterwards, I will do that here.

When I brought up the idea of two billion jobs disappearing (roughly 50% of all the jobs on the planet) it wasn't intended as a doom and gloom outlook. Rather, it was intended as a wakeup call, letting the world know how quickly things are about to change, and letting academia know that much of the battle ahead will be taking place at their doorstep.

Here is a brief overview of five industries—where the jobs will be going away and the

jobs that will likely replace at least some of them—over the coming decades.

1.) Power Industry

Until now, the utility companies existed as a safe career path where little more than storm-related outages and an occasional rate increase would cause industry officials to raise their eyebrows.

Yet the public has become increasingly vocal about their concerns over long-term health and environmental issues relating to the current structure and disseminating methods of the power industry, causing a number of ingenious minds to look for a better way of doing things.

Recently I was introduced to two solutions that seem predestined to start the proverbial row of dominoes to start falling. There are likely many more waiting in the wings, but these two capitalize on existing variances found in nature and are unusually elegant in the way they solve the problem of generating clean power at a low cost.

Both companies have asked me to keep quiet about their technology until they are a bit farther along, but I will at least explain the overarching ramifications.

I should emphasize that both technologies are intended to work inside the current utility company structure, so the changes will happen within the industry itself.

To begin with, these technologies will shift utilities around the world from national grids to micro grids that can be scaled from a single home to entire cities. The dirty power era will finally be over and the power lines that dangle menacingly over our neighborhoods will begin to come down. All of them.

While the industry will go through a long-term shrinking trend, the immediate shift will cause many new jobs to be created.

Jobs Going Away

- Power generation plants will begin to close down.
- Coal plants will begin to close down.
- Many railroad and transportation workers will no longer be needed.
- Even wind farms, natural gas, and biofuel generators will begin to close down.
- Ethanol plants will be phased out or repurposed.
- Utility company engineers, gone.
- Line repairmen, gone.

New Jobs Created

- Manufacturing power generation units the size of air conditioning units will go into full production.
- Installation crews will begin to work around the clock.
- The entire national grid will need to be taken down (a 20-year project). Much of it will be recycled and the recycling process alone will employ many thousands of people.
- Microgrid operations will open in every community requiring a new breed of engineers, managers, and regulators.
- Many more.

2.) Automobile Transportation—Going Driverless

Over the next 10 years we will see the first wave of autonomous vehicles hit the roads, with some of the first inroads made by vehicles that deliver packages, groceries, and fast-mail envelopes.

The first wave of driverless vehicles will be luxury vehicles that allow you to kick back, listen to music, have a cup of coffee, stop wherever you need to along the way, stay productive in transit with connections to the Internet, make phone calls, and even watch a movie or two, for substantially less than the cost of today's limos.

Driverless technology will initially *require* a driver, but it will quickly creep into everyday use much as airbags did. First as an expensive option for luxury cars, but eventually it will become a safety feature stipulated by the government.

The greatest benefits of this kind of automation won't be realized until the driver's

hands are off the wheel. With over 2 million people involved in car accidents every year in the U.S., it won't take long for legislators to be convinced that driverless cars are a substantially safer and more effective option.

The privilege of driving is about to be redefined.

Jobs Going Away

- Taxi and limo drivers, gone.
- Bus drivers, gone.
- Truck drivers, gone.
- Gas stations, parking lots, traffic cops, traffic courts, gone.
- Fewer doctors and nurses will be needed to treat injuries.
- Pizza (and other food) delivery drivers, gone.
- Mail delivery drivers, gone.
- FedEx and UPS delivery jobs, gone.
- As people shift from owning their own vehicles to a transportation-on-demand system, the total number of vehicles manufactured will also begin to decline.

New Jobs Created

- Delivery dispatchers.
- Traffic monitoring systems, although automated, will require a management team.
- Automated traffic designers, architects, and engineers.
- Driverless "ride experience" people.
- Driverless operating system engineers.
- Emergency crews for when things go wrong.

3.) Education

The OpenCourseware Movement took hold in 2001 when MIT started recording all their courses and making them available for free online. They currently have over 2,080 courses available that have been downloaded 131 million times.

In 2004 the Khan Academy was started with a clear and concise way of teaching science and math. Today they offer over 2,400 courses that have been downloaded 116 million times.

Now, the 8,000-pound gorilla in the OpenCourseware space is Apple's iTunes U. This platform offers over 500,000 courses from 1,000 universities that have been downloaded over 700 million times. Recently they also started moving into the K-12 space.

All of these courses are free for anyone to take. So how do colleges, which charge steep tuitions, compete with "free?"

As the OpenCourseware Movement has shown us, courses are becoming a commodity. Teachers only need to teach once, record it, and then move on to another topic or something else.

In the middle of all this we are transitioning from a teaching model to a learning model. Why do we need to wait for a teacher to take the stage in the front of the room when we can learn whatever is of interest to us at any moment?

Teaching requires experts. Learning only requires coaches.

With all of the assets in place, we are moving quickly into the new frontier of a teacherless education system.

Jobs Going Away

- Teachers.
- Trainers.
- Professors.

New Jobs Created

- Coaches.
- Course designers.
- Learning camps.

4.) 3D Printers

Unlike a machine shop that starts with a large piece of metal and carves away everything but the final piece, 3D printing is an object creation technology where the shape of the objects are formed through a process of building up layers of material until all of the details are in place.

The first commercial 3D printer was invented by Charles Hull in 1984, based on a technique called stereolithography.

Three-dimensional printing makes it as cheap to create single items as it is to produce thousands of items and thus undermines economies of scale. It may have as profound an impact on the world as the coming of the factory did during the Henry Ford era.

Jobs Going Away

- If we can print our own clothes and they fit perfectly, clothing manufacturers and clothing retailers will quickly go away.
- Similarly, if we can print our own shoes, shoe manufacturers and shoe retailers will cease to be relevant.
- If we can print construction material, the lumber, rock, drywall, shingle, concrete, and various other construction industries will go away.

New Jobs Created

- 3D printer design, engineering, and manufacturing.
- 3D printer repairmen will be in *big* demand.
- Product designers, stylists, and engineers for 3D printers.
- 3D printer ‘Ink’ sellers.

5.) Bots

We are moving quickly past the robotic vacuum cleaner stage to far more complex machines.

The BigDog robot is among the most impressive and potentially useful for troops in the immediate future—it’s being developed to act as an autonomous drone assistant that will carry gear for soldiers across rough battlefield terrain.

Nearly every physical task can conceivably be done by a robot at some point in the future.

Jobs Going Away

- Fishing bots will replace fishermen.
- Mining bots will replace miners.
- Ag bots will replace farmers.
- Inspection bots will replace human inspectors.
- Warrior drones will replace soldiers.

- Robots can pick up building material coming out of the 3D printer and begin building a house with it.

New Jobs Created

- Robot designers, engineers, repairmen.
- Robot dispatchers.
- Robot therapists.
- Robot trainers.
- Robot fashion designers.

Final Thoughts

In these five industries alone there will be hundreds of millions of jobs disappearing. But many other sectors will also be affected.

Certainly there’s a downside to all this. The more technology we rely on, the more breaking points we’ll have in our lives.

Driverless drones can deliver people. These people can deliver bombs or illicit drugs as easily as pizza.

Robots that can *build* building can also *destroy* buildings.

All of this technology could make us fat, dumb, and lazy, and the problems we

thought we were solving become far more complicated.

We are not well equipped culturally and emotionally to have this much technology entering into our lives. There will be backlashes, “destroy the robots” or “damn the driverless car” campaigns with proposed legislation attempting to limit its influence.

At the same time, most of the jobs getting displaced are the low-level, low-skilled labor positions. Our challenge will be to upgrade our workforce to match the labor demand of the coming era. Although it won’t be an easy road ahead it will be one filled with amazing technology and huge potentials as the industries shift.

Interested in sharing your thoughts? Go to www.FuturistSpeaker.com. 🐼

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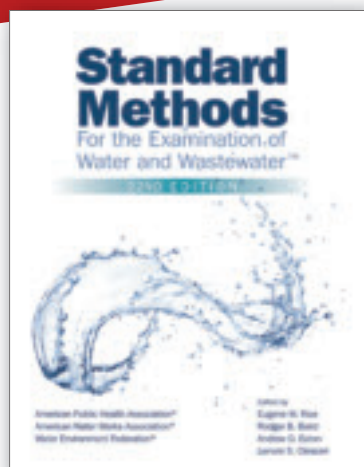
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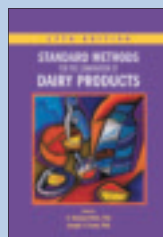


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▶ LEGAL BRIEFS



Patti Waller, MS

Depositions 101

Editor's Note: The *Journal* recognizes the importance of providing readers with practical and relevant legal information and is pleased to bring back the popular Legal Briefs column. In every other issue of the *Journal* this information will be presented by the attorneys at Seattle-based Marler Clark, LLP, PS (www.marlerclark.com). Marler Clark has developed a nationally known practice in the field of food safety. They represent people who have been seriously injured or the families of those who have died after becoming ill with foodborne illness during outbreaks traced to restaurants, grocery chains, and other food suppliers.

Patti Waller joined Marler Clark in 2003 after working for 12 years in the Communicable Disease Program at the Washington State Department of Health where she investigated food and waterborne illnesses and outbreaks. At Marler Clark Ms. Waller uses her expertise to develop protocol, screen potential clients, and gather evidence for successful litigation. She earned a Master of Science degree in epidemiology from the University of Washington.

It arrives innocently enough in the mail. "IT" is a deposition subpoena, informing you that you are required to appear and testify as a witness in a foodborne illness lawsuit. You vaguely remember the series of restaurant inspections you conducted during the investigation but the outbreak occurred nearly two years ago. Why are you being deposed and what does that mean?

Depositions are conducted under Rule 30 of the Federal Rules of Civil Procedure in civil litigation cases as part of the discovery process. The purpose is to give attorneys the opportunity to gather facts about a case before trial. The deponent, i.e., the person being questioned, might be the plaintiff (person

filing suit) or the defendant (person being sued or charged with a crime). Experts or witnesses to an event might also be deposed. You would most likely find yourself being deposed as a "witness."

What Is a Deposition?

A deposition is part of the process of assembling evidence before trial in a lawsuit. It is called by an attorney for one of the parties to a lawsuit and takes place away from the courtroom. There are several reasons to depose you as a witness. A deposition allows attorneys to evaluate how you will do as a trial witness and establishes what your testimony will be. Everything you say while

being deposed is transcribed and serves as a reference if you forget or alter your answer at trial. In a deposition, attorneys can ask for your opinion or for secondhand information (hearsay). These are not usually allowed in trial. In short, the deposition process serves many functions that help determine how and if litigation will proceed.

Preparing for Your Deposition

Your agency attorney should meet with you well in advance of the deposition. The two of you should review any documents or photographs you have been asked to provide. He/she should tell you what to expect during the deposition and provide guidance on how to answer questions properly. Your agency attorney should accompany you to your deposition.

At the Deposition

A court reporter will be present to record attorney questions and your answers. Advanced notice must be given if your deposition is going to be videotaped. Prior to the start of the deposition, the court reporter will administer an oath under which you agree to tell the truth. Failure to tell the truth constitutes perjury. In general, you are required to answer each question asked. The objections that may be asserted by your agency attorney are to questions that may violate an attorney-client privilege or the work product doctrine.

The examining attorney who called the deposition will start by asking you to provide your name and background information. He/she will explain the procedures for conducting the deposition. When questioning begins, listen to the entire question. If you did not

hear the question or do not understand it, say so. Think about the question and answer carefully before responding. Take as much time as you need to formulate your answer. If you are being asked to answer "yes" or "no," do not elaborate further. In fact, never provide more information than what is being asked. Do not guess at any answer. It is perfectly acceptable to say you do not know the answer or that you have forgotten. You have the right to confer with your attorney in private at any time during the deposition. If you need to take a break, ask for one.

Attorneys use recognized strategies to gather information during a deposition. At the onset they want to put you at ease so that you will answer freely. They may start with broad questions before tackling the more difficult ones. An astute attorney will guide you reasonably through your testimony to obtain the information sought. Unfortunately, you may find yourself in a different situation. The examining attorney may ask you a rapid set of questions, leaving you little time to think

through your response. Another common strategy is to ask leading questions to arrive at desired answers. You may find yourself answering the same question asked slightly differently multiple times. In all cases, stay calm and do not argue.

After the examining attorney has finished asking questions, attorneys for other parties are allowed to ask follow-up questions or seek clarification. None of them is allowed to conduct a lengthy interrogation, however. The attorneys may spend a few minutes reviewing their notes before officially ending the deposition. As you leave, remain professional and do not discuss the case further, even informally.

After the Deposition

After the deposition is over, the court reporter will prepare the transcript of the questions and answers and all parties will receive copies. You will have the opportunity to review the transcript and make grammatical or spelling corrections if necessary. This transcript

may be filed with the court and become publicly available.

Depositions are invaluable tools in the litigation process. Sometimes enough information is gathered that attorneys can predict the outcome of a prospective trial, propelling them towards settlement and avoiding an expensive trial. Depositions are not meant to be scary or intimidating. The experience will be less daunting if you understand the process and prepare in advance. 🇺🇸

Disclaimer: Legal Briefs is published for information purposes only; none of the information is intended to be, nor is, formal legal advice. NEHA and the *Journal of Environmental Health* are not liable or responsible for actions taken on the basis of the information contained in these columns.

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Did You Know?

NEHA is adding two new food safety credentials to its credentialing program. These credentials, which will enhance the country's food safety prevention initiatives, will be available this summer. Check NEHA's Web site for updates on the release of these significant credentials.

EH CALENDAR

UPCOMING NEHA CONFERENCES

June 28–30, 2012: San Diego Marriott Marquis & Marina, San Diego, California. For more information, visit www.neha2012aec.org.

July 9–11, 2013: Hyatt Regency Crystal City at Reagan National Airport, Washington, DC.

NEHA AFFILIATE AND REGIONAL LISTINGS**Alabama**

June 6, 2012: 2012 Annual Education Conference, sponsored by the Alabama Environmental Health Association, Alabama 4H Youth Development Center, Columbiana, AL. For more information, visit www.aeha-online.com/5522.html.

Colorado

September 26–28, 2012: 2012 Annual Education Conference & Exhibition, sponsored by the Colorado Environmental Health Association, Keystone Lodge & Spa, Keystone, CO. For more information, visit www.cehawe.com/aec.html.

Connecticut

September 26–28, 2012: 50th Annual Yankee Conference, hosted by the Connecticut Environmental Health Association, Mystic Marriott, Groton, CT. For more information, visit www.cteha.org.

Florida

September 6–8, 2012: FEHA Annual Training Meeting and Trade Show, sponsored by the Florida Environmental Health Association, Royal Plaza Resort, Lake Buena Vista, FL. For more information, visit www.feha.org.

Georgia

July 11, 2012: 2012 GEHA Annual Education Conference, sponsored by the Georgia Environmental Health Association. For more information, visit www.geha-online.org.

Illinois

August 29–30, 2012: South Chapter Annual Educational Conference, sponsored by the Illinois Environmental Health Association, Holiday Inn, Mount Vernon, IL. For more information, visit www.iehaonline.org.

Indiana

September 23–26, 2012: IEHA Annual Fall Educational Conference, sponsored by the Indiana Environmental Health Association, Inc., Bloomington Monroe County Convention Center, Bloomington, IN. For more information, visit www.iehaind.org/conference/html.

Missouri

October 3–5, 2012: 2012 Annual Education Conference, sponsored by the Missouri Environmental Health Association, The Resort at Port Arrowhead, Lake Ozark, MO. For more information, visit www.mmfeha.org.

Montana

October 2–3, 2012: MEHA/MPHA Fall Conference: “Healthier People in a Healthier Environment,” co-sponsored by the Montana Environmental Health and Public Health Associations, Copper King Hotel and Convention Center, Butte, MT. For more information, visit www.mehawe.com.

Nevada

July 31–August 2, 2012: 2012 NvEHA Annual Educational Conference, sponsored by the Nevada Environmental Health Association, Three Square, Las Vegas, NV. For more information, visit www.nveha.org/conf_reg_2012.html.

North Carolina

July 18–20, 2012: 66th Annual Interstate Environmental Health Seminar, hosted by the North Carolina Environmental Health Association, Fontana Village Resort, NC. For more information, visit www.wvdhhr.org/wvas/IEHS/index.asp.

Oregon

October 8–9, 2012: 2012 Annual Education Conference, sponsored by the Oregon Environmental Health Association, Oregon State University, Corvallis, OR. For more information, visit www.oregoneha.org/aec.htm.

Texas

October 9–12, 2012: 57th Annual Education Conference, sponsored by the Texas Environmental Health Association, Double Tree Hotel, Austin, TX. For more information, visit www.myteha.org.

Utah

September 19–21, 2012: UEHA Fall Conference, sponsored by the Utah Environmental Health Association. For more information, visit www.ueha.org/events.html.

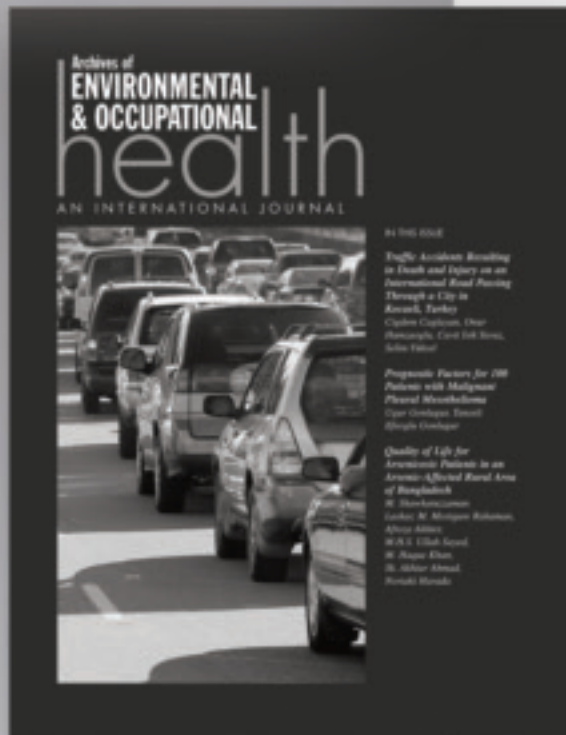
Wyoming

September 18–20, 2012: 2012 WEHA Annual Education Conference, sponsored by the Wyoming Environmental Health Association, Best Western Tower West Lodge, Gillette, WY. For more information, visit www.wehaonline.net/events.asp.

INTERNATIONAL LISTINGS

October 21–28, 2012: 66th Annual Conference and Exhibition, sponsored by the Jamaica Association of Public Health Inspectors, Jamaica (location TBD). For more information, e-mail info@japhi.org.jm.

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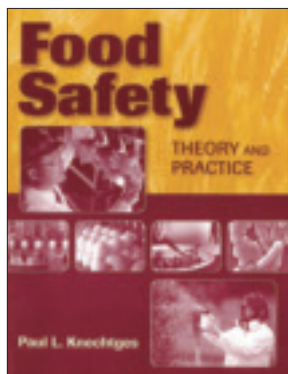
RESOURCE CORNER

Resource Corner highlights different resources that NEHA has available to meet your education and training needs. These timely resources provide you with information and knowledge to advance your professional development. Visit NEHA's online Bookstore for additional information about these, and many other, pertinent resources!



Food Safety: Theory and Practice

Paul L. Knechtges (2012)



New! Authored by a NEHA member! Written from a “farm-to-fork” perspective, this book provides a comprehensive overview of food safety and discusses the biological, chemical, and physical agents of foodborne diseases. Early chapters introduce readers to the history and fundamental principles of food safety. Later chapters provide an overview of the risk and hazard analysis of different foods and the important advances in technology

that have become indispensable in controlling hazards in the modern food industry.

460 pages / Paperback / Catalog #1120

Member: \$69 / Nonmember: \$71

Food Safety Fundamentals: Essentials of Food Safety and Sanitation (Second Edition)

David McSwane, Richard Linton, Nancy R. Rue, and Anna Graf Williams (2010)



This book incorporates the best food safety and sanitation practices for the overall food industry. It utilizes the latest standards in FDA's 2009 Food Code and is filled with food-service and retail industry photos and easy-to-read charts. The book is designed to make managers knowledgeable about food hazards, while emphasizing proper food handling practices to enable participants to successfully complete all nationally certified

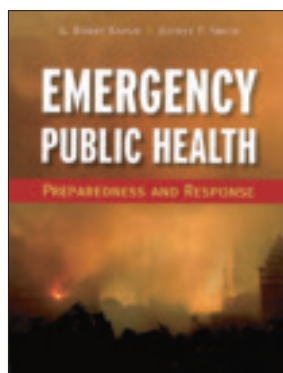
exams. Study reference for NEHA's CP-FS exam.

321 pages / Paperback / Catalog #1093

Member: \$59 / Nonmember: \$69

Emergency Public Health: Preparedness and Response

G. Bobby Kapur and Jeffrey P. Smith (2011)



Newly added! *Emergency Public Health* provides a unique and practical framework for disaster response planning at local, state, and national levels. This is the first book of its kind to systematically address the issues in a range of environmental public health emergencies brought on by natural calamity, terrorism, industrial accident, or infectious disease. It features historical perspectives on a public health crisis, an analysis of preparedness, and a

practical, relevant case study on the emergency response. Study reference for NEHA's REHS/RS exam.

568 pages / Paperback / Catalog #1121

Member: \$79 / Nonmember: \$84

Public Health Business Planning: A Practical Guide

Stephen N. Orton, Anne J. Menkens, and Pamela Santos (2009)



In today's turbulent and financially stressful times, public health managers need business planning skills. They need to become “civic entrepreneurs,” who can creatively finance and manage needed programs using practical business school savvy. This book offers practical, step-by-step guidance for creating business plans that address the unique challenges of public health programs. The chapters thoroughly cover each part of a business plan (marketing, operations, budgeting, etc.) in a

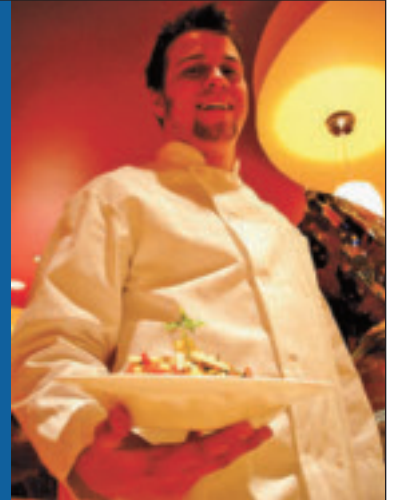
user-friendly style that is appealing to students and practicing public health managers alike.

174 pages / Spiral-bound paperback / Catalog #1086

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Individuals who have contributed to the foundation are listed below by club category. These listings are based on what people have actually donated to the foundation—not what they have pledged. Names will be published under the appropriate category for one year; additional contributions will move individuals to a different category in the following year(s). For each of the categories, there are a number of ways NEHA recognizes and thanks contributors to the foundation. If you are interested in contributing to the Endowment Foundation, please fill out the pledge card or call NEHA at 303.756.9090.

Thank you.

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Role of Environmental Health in Sustainable Communities

Editor's Note: NEHA Technical Advisors are subject-matter experts who represent 30 different topical areas of environmental health. These individuals are appointed by the NEHA president and are responsible for providing subject-matter expertise and counsel to NEHA's board of directors, staff, affiliates, and members. Within their areas of expertise, their specific duties include the following: staying abreast of the latest developments and educational needs of the profession; identifying and sharing trends and needs of importance; actively assisting in the development and implementation of the education offered at the NEHA AEC; assisting NEHA in responding to press inquiries, developing position papers, serving as an expert witness, and speaking on behalf of the association; and other activities requested and agreed upon by the NEHA board of directors. A complete listing of Technical Advisors can be found in the Special Listing section of the *Journal*.

The NEHA Technical Advisors' Corner was created to provide readers with relevant, timely, and useful information generated from the NEHA Technical Advisors. This feature will be printed occasionally throughout the year as content is made available to NEHA from the Technical Advisors.

The first installment of the Technical Advisors' Corner is referenced in the Managing Editor's Desk (see page 66). The *Journal* highly recommends that you read that column before reading this article.

Tom R. Gonzales is the environmental health director for El Paso County Public Health (Colorado). Mark McMillan is the unit supervisor for the oil and gas team of the Colorado Department of Public Health and Environment. Both serve as Technical Advisors to NEHA's Sustainability Technical Section.

As a city or county manager, you are frequently asked by your citizens to make their government more sustainable. Usually they are asking you to implement a more economically sustainable government, especially during these challenging fiscal times. When you seek to carry

out the citizens' wishes, what department or programs do you contact to assist you in this task? The most obvious would be your finance or budget department and perhaps your leadership team. However, have you ever considered contacting your environmental health program? I'm sure you're thinking

... why would I contact my environmental health program, aren't they just responsible for inspecting restaurants, pools, and septic? Actually, environmental health professionals do more than just inspections; they protect human health from detrimental conditions in the environment through education, consultation, and collaboration.

With respect to environmental health, we can define sustainability as "meeting the needs of the present generation without negatively impacting the environmental health of the future." NEHA states "environmental health and protection refers to protection against environmental factors that may adversely impact human health or the ecological balances essential to long-term human health and environmental quality (NEHA, 2010)." Therefore, sustainability's role in environmental health is to ensure that the actions of our current generation do not have negative impacts on the human health and environmental quality of the future.

Sustainable practices include energy consumption, water quality and quantity, agriculture, waste management, and urban design, which collectively play a pivotal role in maintaining environmental health for future generations (U.S. Environmental Protection Agency, 2008). These sustainable practices furthermore lead to reduction in cost, thus generating a savings that can help reduce budget expenses. This is the link between environmental health and economics!

Energy sustainability is a complex issue that involves environmental, political, and economic implications. Sustainable energy can be defined as the provision of energy resources such that we are able to meet the

energy needs of today without compromising future generations (Gohike, Hrynkow, & Portier, 2008). Unsustainable energy use has the potential to compromise future generations in several different ways. Energy resources could become depleted, which could in turn create serious political and economic consequences. Unsustainable energy consumption, which includes the burning of fossil fuels, is also known to have consequences including air pollution, water pollution, and land degradation.

Environmental health professionals are involved in many areas of water quality issues including water supply protection, the education and management related to waterborne diseases, beach water quality, wastewater reduction, potable water testing/reporting, and storm water management. Improving efficiency and conservation can be the most economically, politically, and environmentally responsible way to increase supply and save for the future (Frumkin, 2005).

Water conservation and education should be the main focus of any water sustainability efforts. Efficient home construction, appropriate land use planning, reduction in water waste, and community planning can all reduce costs and stresses on natural resources and help maintain quality of life. Adequate community education and design can significantly reduce water consumption. Efforts in resource management, such as conservation, water efficient homes and landscaping, and water banking can help alleviate some of the stresses on the water supply.

Environmental health professionals can promote water conservation and wastewater management and ensure clean water supplies by 1) informing policy makers and developers on the available treatment and conservation opportunities and processes available, 2) educating facilities, 3) using and promoting local success stories, and 4) the implementing relevant laws, acts, and regulations.

Sustainability in the arenas of agriculture, food, and landscaping includes the consideration of consumer health and safety and maintaining or improving land and natural resources. For example, sustainable agriculture addresses environmental and social concerns and offers economically viable opportunities for a variety of groups including growers, policy makers,

and consumers. Food and agricultural sustainability is hampered by issues of water quality and usage, soil erosion, irrigation management, and contamination of groundwater by pesticides, herbicides, nitrates, and selenium (Makuch, Gagnon, & Sherman, 2004). Irrigation management means improving water conservation and storage measures, using reduced-volume irrigation systems, or not planting at all. Mandates for water conservation are being instituted by many municipalities. Sustainable landscaping involves the reduction or prevention of water runoff from hardscapes into storm sewers that empty into rivers, streams, lakes, and oceans.

When most people think of sustainability, often the environment comes to mind and the three "Rs": reduce, reuse, and recycle. Solid waste is a problem for individuals, companies, and the country; therefore, the social, economic, and environmental aspects of solid waste planning and sustainability must be addressed when considering solid waste reduction planning.

Environmental health professionals can assist businesses by educating them about the practicality and money-saving potential of the three Rs. For instance, a business can request information from its material suppliers to determine if the material currently in use can be replaced by alternative materials and how best to reuse or extend the life of the material. A business can research how to package wastes so as to make them non-hazardous, thereby reducing the quantity of hazardous waste generated. The local health department may also have ideas about how to recycle materials. Local health departments can regulate waste haulers, promote zero-waste goals for certain types of businesses, recommend reuse of construction/demolition waste, and promote material purchasing and reuse policies.

Those involved with urban design are typically urban planning individuals. They look at a proposed development or land use with respect to specific criteria applicable to that type of use. For example, a new subdivision would include evaluation of the necessary utilities (sewer, water, gas, etc.), infrastructure (roads, lighting, fire protection, etc.), and recreational areas (parks, playgrounds, etc.). Although environmental health does not play a major role in most urban design

evaluations, it may be applicable for specific land use types that can or will have environmental and health impacts, such as landfills, hazardous waste facilities, wastewater disposal, and similar operations. Depending upon the type and location of such facilities, they may actually be more "rural" than "urban." However, the function of the environmental health professional remains the same.

To further highlight the contributions environmental health professionals can provide to sustainability, NEHA has worked closely with professionals from Vail, Colorado. Their story has been clear:

"Develop a business case for a sustainability program or plan. Cost/benefit tools for energy projects are available in a cost analysis template that can help evaluate the financial potential of energy projects or groups of projects (DSIRE). Calculations will provide information on payback, internal rate of return, net present value, and impact on annual income statement. A number of financing options are available for funding sustainability initiatives, particularly large capital projects. The first option when seeking funding for sustainability measures is to pursue available grants, rebates, and donations. Sustainability strategies are particularly attractive to potential donors. Other funding sources for sustainability initiatives could include, but are not limited to, the use of power purchase agreements, carbon emission offset programs, and energy performance contracting." —Bill Carlson, Town of Vail

In conclusion, as a city or county manager you may be called into action on a sustainability initiative, whether the initiative is one of cost or energy savings. Fortunately, there are additional partners to assist you in the form of environmental health professionals that are available in your communities. For more information about ways in which NEHA can be of service, please go to www.neha.org.

Note: This article will be published in June in the International City/County Management Association's PM Plus online version.

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Frumkin, H. (2005). *Sustainability and human health*. Washington, DC: U.S. Environmental Protection Agency.

Gohike, J.M., Hrynkow, S.H., & Portier, C.J. (2008). Health, economy, and environment: Sustainable energy choices for a nation. *Environmental Health Perspectives*, 116(6), A236–A237.

Makuch, J., Gagnon, S., & Sherman, T. (2004). *Agricultural conservation practices and related issues: Reviews of the state of the art and research needs*. Beltsville, MD: U.S. Department of Agriculture.

National Environmental Health Association. (2010). *Sustainability library resources*. Retrieved from <http://www.neha.org/sustainability/index.html>

North Carolina State University. (2011). *The database of state incentives for renewables and efficiency (DSIRE)*. Retrieved from www.dsireusa.org

U.S. Environmental Protection Agency. (2008). *Green remediation: Incorporating sustainable environmental practices into remediation of contaminated sites*. Washington, DC: Author.

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Managing Editor's Desk

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editorial.) Knowing this and knowing further that communities are typically staffing such programs with people who lack the training and expertise that exist in environmental health, we are advising local leaders that our profession can help them to meet their goals in impressive and lasting ways.

NEHA has a remarkable sustainability technical section co-chaired by Tom Gonzales and Mark McMillan. They put together the paper that will be published this June by ICMA.

To give all NEHA members a close-up look at what we are telling local leaders about what our profession can do in sustainability, we are publishing their article in this issue of the *Journal* (see p. 52) as a companion piece to my editorial.

Thanks Tom and Mark (and even the NEHA board who demarked this path to the future for our profession), for helping us to make the future we want, actually happen. 🐾

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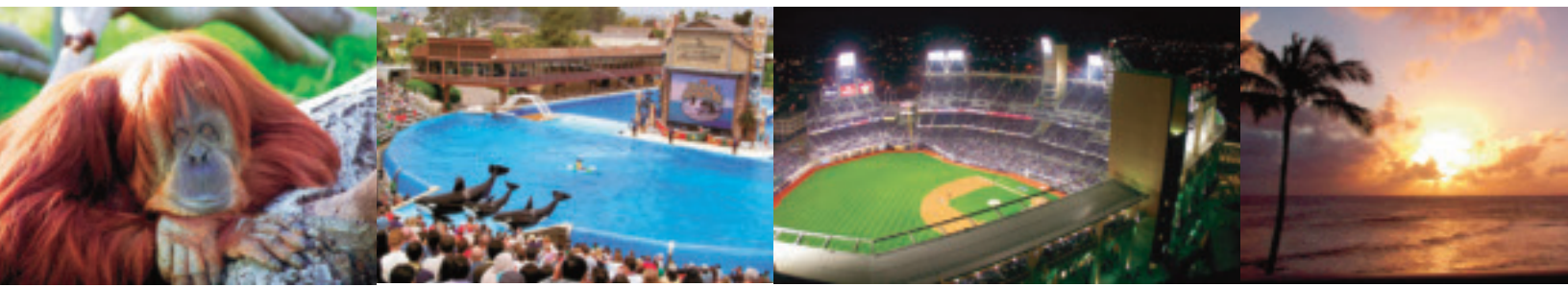
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Full Conference Registration	\$665	\$825
One Day Registration	\$335	\$385
Student/Retired Registration	\$185	\$255

Save on AEC Registration – Join NEHA as a Member Today!

Become a NEHA member and take advantage of the member registration rate of \$665 for the full conference. An annual membership is just \$95 and includes a free subscription to the *Journal of Environmental Health*; free Continuing Education credits for e-Learning courses; access to a members-only website, which includes a member directory; affinity programs with discounts for NEHA members on various goods and services; and more!

Hotel Room Reservations

To make your hotel reservations, visit neha2012aec.org/hotel.html.

Please see website for room availability and hotels offering NEHA AEC attendees special discounts on their room rates.

**The NEHA AEC
will take place
at the San Diego
Marriott Marquis
& Marina.**



**San Diego Marriott
Marquis & Marina**

333 West Harbor Drive, San
Diego, CA 92101

Customize Your Learning Experience



The NEHA AEC offers so many different facets for you to choose from to customize your own learning experience. From the multitude of environmental health topics discussed to the different learning environments of the Lecture and Learning Lab to the option to attend in-person or virtually, the NEHA AEC offers a fresh, progressive, and modern approach to training and education.

TRAINING

Productivity. Efficiency. Effectiveness.

Training



LEARNING LAB SESSIONS

Engage in interactive, dynamic, and self-driven sessions, which will provide you with hands-on training and real-world experience to help you cultivate new skills and bolster your proficiency to increase your productivity as an environmental health professional.

EH Health Impact Assessments (HIA)

- Designing an HIA: You Take the Lead
- Tox in a Box: A Concise Training on the Health Assessment of Environmental Hazards

Food Protection and Defense

- My Restaurant Did What?!
Session sponsored by Decade Software Company
- ROP HACCP: Hazards, Preventive Measures, and Educational Opportunities

General EH

- Business Networking 101
- Radiological Tales: Lessons Learned for the EH Professional
- Tracking in Action: Using the Tracking Network to Impact Environmental & Public Health Programs

Informatics/Leadership/Management

- Making the Message Stick

- Wake Up to the Social Media Planning Challenge
- Woodstock to WWF: How to Benefit from Generational Differences in the Workplace

Onsite Wastewater

- (Field Trip) Tour of an Ecological Wastewater Treatment and Reuse: Decentralized Model
Session sponsored by Living Machine Systems

Technology and EH

- Mobile Phone Usage: More, More, More or Less, Less, Less?
- There's an App for That
- (Field Trip) University of California, San Diego: California Institute for Telecommunications and Information Technology—Cal-(IT)2 Tour

Terrorism/All-Hazards Preparedness

- Using Community-Based Participatory Research to Build Capacity for Environmental Emergency Preparedness and Disaster Resilience

The sessions below are a special group of Learning Labs that are scheduled for several hours each day during the AEC. At any one time, there will be multiple sessions taking place. Like other Learning Labs, these sessions will have a presenter and will be highly interactive. However, you are in charge of when you want to attend and the pace at which you wish to learn about a particular topic.

Children's EH

- Sanitation in Classroom and Food Preparation Areas in Child Care Facilities from North and South Carolina

Food Protection and Defense

- Food Establishment Resource Library (FERL) on the Southern Nevada Health District Website
- What's Cooking? Ethnic Foods 101

Healthy Homes and Communities

- The Effects of Indoor Air Pollutants on the Lung Health of Asthmatic Patients

EDUCATION

Knowledge. Understanding. Expertise.

Education



LECTURE SESSIONS

Acquire comprehensive information from environmental health subject matter experts and industry leaders, and learn from your peers as you share stories and best practices to address common challenges.

Children's EH

- Effectiveness of Local Lead Poisoning Prevention Laws
- Food Safety Risk, Response, and Resources: A School Food Service Action Guide
- Lead Guidelines for Children's Play Areas: The Need for Clean Soil Policies to Protect Children
- Methamphetamine Contamination Closes West Virginia School
- Pediatrician's Perceptions on Child Lead Poisoning

- Protecting Children: Tools to Improve Environmental Health in Child Care Settings
- What Got Into the Kids?

EH Health Impact Assessments (HIA)

- Community Engagement and Health Impact Assessments
- Environmental Impact Assessment: An Unrealized Opportunity for Environmental Health
- Using Health Impact Assessments for Comprehensive Plan Updates

Emerging EH Issues

- Medical Marijuana in California: Legal Standing and Dealing with Edible Products
- The Role of Public Health in Promoting a Food System that Is Safe, Secure, and Sustainable: S3
- What Is the Matter with Raw Milk?

Food Protection and Defense

- Addressing Illegal Food Vending and Food Defense with Education and Innovation
- Are You on the Cutting Edge?

- (Food Safety Focus) FSMA: What it Signifies for the Training and Certification of Regulatory Personnel
Session sponsored by MindLeaders and Prometric
- (Food Safety Focus) What Does it Mean to be Epi-Ready? How the Emergency Response Network Works
Session sponsored by MindLeaders and Prometric
- Impact of Internet Posting of Restaurant Inspection Scores on Critical Violations
Session sponsored by Decade Software Company
- New Deli Slicer Standards in Food Safety
- Pets in Retail Food Outlets: A Literature Review
- Scores and More: Can You be Sued for Giving a Restaurant a Good Grade?
- The Fight Against Food Allergens: What Regulators and Industry Need to Know
Session sponsored by San Jamar
- The Role of Rapid Cycle Improvement in Addressing Recurrent Critical Violations in Restaurants
- What's Hiding in Your Sandwich?
Session sponsored by San Jamar

General EH

- Effective Strategies to Reduce Motor Vehicle Injuries in Native American Communities
- How an Agricultural Field Toilet Inspection Program Reduced Food Contamination Risk and Improved Farm Worker Health
- Human Mercury and Antibiotic Resistant Bacterial Sampling Along the Indian River Lagoon, FL: Dolphin and Human Health
- Nanomaterials for Environmental Remediation: Nanoinformatics for State Agencies' Safety and Health Regulatory and Oversight
- Outdoor Air Quality Impacts at Hydraulic Fracturing ("Fracking") Sites in Fort Worth
- Rat Hoarder Case
Session sponsored by Orkin

Hazardous Materials and Toxic Substances

- California's Unified Approach to Hazardous Material Programs
- Interagency Cooperation Helps Solve Mercury Mystery Threatening Children in Twin Falls, Idaho
- Methamphetamine Lab Contamination: A Different Look at the Impact of the Meth Epidemic
- Responding to Mercury Incidents
- San Bruno—Restoring a Community
- What Do You Do When You Have a Bomb Factory in Your Neighborhood?
- What Goes Up Must Come Down: Lessons Learned from Emergency Air Monitoring During the Escondido Bomb House Burn

Healthy Homes and Communities

- Home Is Where the Hazards Are
- Indoor Air Quality in Rural Alaskan Homes
- Preserving Our Past to Protect Our Future
- The Fungus Among Us: Blasto Isolated in the Home Environment
- The Inspector's Guide to Indoor Pool Air Quality

- "Why Don't People Walk?!" A Case Study of Active Travel at a Sustainable University

Informatics/Leadership/Management

- Cross Community Collaborations for Environmental Health
- EPH & Priority Based Budgeting—This Happened to Me!
- Look Inside a Statewide Environmental Reporting System Project
Session sponsored by Decade Software Company
- State Environmental Health Policy
- Sustainable Policy in Environmental Public Health
- Using Dashboards to Make More Sense of Your Data
- Using Environmental Public Health Tracking Data to Assess State Public Health Laws

International EH

- Contents of Heavy Metals in Arable Soils and Birth Defect Risks in Shanxi, China: A Small-Area Level Geographical Study
- Implication of E-Waste Trafficking on Human Health
- Rapid Evaluation and Improvement of Drinking Water Supplies in Africa
- Understanding Team Organizational and Incident Command Challenges: Practice and Application During Two Different International Outbreak Responses

Onsite Wastewater

- Ecological Wastewater Treatment and Reuse: The Decentralized Model
Session sponsored by Living Machine Systems
- Recycled Coconuts as an Onsite Wastewater Technology?

The following sessions are being presented by the California Onsite Wastewater Association (COWA):

- Conducting a Small Community Assessment for Wastewater Infrastructure Improvements
- Contracts: Managing Expectations
- OWTS Inspections
- OWTS Management, Operations, Maintenance & Monitoring
- Principles of Plan Checking
- Technology Approval
- Writing a Successful Grant

Additional sessions will also be offered by the State Onsite Regulators Alliance (SORA).

Pathogens and Outbreaks

- Collaboration Between FDA and Local Agencies to Assess the 2011 Multistate Cantaloupe *Listeria monocytogenes* Outbreak
- Legionnaires' Disease Outbreak at a Long-Term Care Facility: Environmental Health Considerations
- Passing Parasites: A Rare Foodborne Giardiasis Outbreak at a Restaurant
- Rapid Response Teams and the FDA CORE Network: Improving Foodborne Outbreak Responses
- Severe Brain Infections and the Environment: The Changing Epidemiology of *Naegleria fowleri* Infections

- Water and Foodborne Enteric Protozoa: Current Considerations for Environmental Health
- Zygomycosis Issue Following the Joplin Tornado

Recreational Waters

- A Potpourri of New Standards You Need to Know about for Pool and Spa Inspections
- Biofilms in Recreational Water: What Makes Them So Hard to Treat?
- Building an Aquatic Health Program of Excellence
- National Swimming Pool Codes—Junction of Health and Building Officials
- Pool Safety: From Construction to Technology
- Ultraviolet for Aquatics & Spray Parks: Air Quality and *Cryptosporidium*

Sustainability/Climate Change

- Climate Change Impacts on the Built Environment and Public Health
- Confronting Climate Change Health Risks in the Pacific Northwest
- Environmental Health, Sustainability, and Land Use Planning—A Perfect Trifecta
- Innovative Solid Waste Permitting, Organics Diversion, and Sustainability in the Napa Valley
- Wildfire Particulate Emissions and Respiratory Health Under Climate Change Scenarios: Project Overview and Results

Terrorism/All-Hazards Preparedness

- A Day of Disaster: The Environmental Health Impact of the April 2011 Tornadoes in Alabama
- Functional Assessment Service Teams (FAST): Emergency Sheltering for People with Access and Functional Needs
- National Preparedness Measures and Their Implications for Environmental Health
- Response to Hurricane Irene
- Riverwatch 2011: An Environmental Public Health Response to a Major Flood Event
- Riverwatch 2011: How a Local Environmental Public Health Agency Implemented Health Codes to Condemn Private Residences
- Understanding Water Issues During Selected Natural Disasters

Vector Control and Zoonotic Diseases

Session track sponsored by Orkin

- Bed Bugs: A Re-Emerging Public Health Challenge
- Environmental Risk Factors for Re-Emerging Epidemic Typhus
- What Is the Buzz about PCRs?
- Where Have All the Vector Programs Gone?

Water Quality

- An Evaluation of Dual Bacteria Indicators for Urban Stormwater Control
- Minnesota's Assessment Source Water Monitoring Study
- Toolbox Approach of Source Tracking Human Sewage in Storm Drains

Pre-Conference Workshops

EHTER Emergency Response Training

► **Tuesday & Wednesday, June 26 & 27, 8:00am–5:00pm**

California Department of Public Health Center for Environmental Health, CDC, and NEHA are pleased to offer the Environmental Health Training in Emergency Response (EHTER) Awareness Level training course for environmental health professionals. This two-day EHTER Awareness Level course provides an overview of the environmental health roles and responsibilities, issues, and challenges faced during emergency response. The purpose of the course is to increase the level of emergency preparedness of environmental health practitioners and other emergency response personnel by providing them with the necessary knowledge, skills, and resources to address the environmental health impacts of emergencies and disasters.

Applicants are encouraged to complete basic NIMS/ICS/SEMS trainings prior to attendance.

This course offers sixteen hours of continuing education credit for California Registered Environmental Health Specialists.

*Cost is \$99 for members and \$199 for non-members.
Limit 55 people.*

Epi-Ready Team Training: Foodborne Illness Response Strategies Workshop

► **Tuesday & Wednesday, June 26 & 27, 8:00am-5:00pm**

NEHA is offering this training opportunity for environmental health professionals, epidemiologists, laboratorians, and public health nurses involved in conducting foodborne disease outbreak investigations. This two-day workshop is composed of interactive group exercises, Q&A sessions, and lectures spanning the scope of an investigation.

Workshop cost includes the Communicable Diseases book, IAFF's Procedures to Investigate Foodborne Illness, the course manual, and the Physician's Primer, which is a value of over \$70.

*Cost is \$149 for members and \$249 for non-members.
Limit 40 people.*

Industry-Foodborne Illness Investigation Training (I-FIIT) Workshop

► **Wednesday, June 27, 8:00am–5:00pm**

I-FIIT is a one-day face-to-face workshop designed to bring together retail food service representatives and local and state regulatory officials in an effort to create stronger working relationships prior to a potential foodborne incident occurring, so that if and when it does, the foundation is already set for a collaborative effort. Additionally, the workshop provides a better understanding and clarification of the investigation process by identifying roles and responsibilities, discussing early detection strategies and establishing and implementing control measures based on model practices. By providing this training, I-FIIT

aims to assist industry and regulatory officials in producing a more rapid, efficient and effective, response to foodborne illness incidents.

Applicants should be mid- to upper-level management from retail food service stores and restaurants. For more information and a registration form, please visit neha2012aec.org.

*Cost is \$299 per person.
Limit 30 people.*

Commercial Cooking Ventilation Requirements

► **Wednesday, June 27, 8:00am–12:00noon**

Mechanical Code and NFPA 96. This workshop will include information on recirculating systems—referred to as “ductless hoods”—and cooking appliances that do not require exhaust hoods. Information will be provided on key installation concerns, proper sizing of hoods, sanitation issues, and the scope and limitations of the listed products used in the commercial kitchen exhaust systems. This workshop will identify resources available to assist in plan checking and inspecting installations.

*Cost is \$109 for members and \$159 for non-members.
Limit 24 people.*

NSF Training Course “Plan Review for Food Establishments”

► **Thursday, June 28, 8:00am–5:00pm**

NSF International's Center for Public Health Education is pleased to announce a new training course entitled “Plan Review for Food Establishments.” This course was developed by NSF International's leading environmental health professionals and represents the latest plan review information in a dynamic and interactive format. Whether you are a regulator or an industry professional hoping to build knowledge of the plan review process, the course will provide key information that ensures accordance with current U.S. Food and Drug Administration (FDA) guidelines. This one-day workshop will cover the Plan Review application process; regulatory authority compliance; design, installation and construction of a food establishment; compliance with Hazard Analysis Critical Control Points (HACCP) and Good Manufacturing Practices (GMPs); and a plan review outline as it pertains to the current food code. Students should bring a set of plans to work with and students will be provided with a copy of the year 2000 FDA/CFP Plan Review Blue Book.

“Plan Review for Food Establishments” is strongly recommended for sanitarians, consultants, local and state regulatory officials, industry professionals responsible for the preparation, design and approval of food establishment plans.

*Cost is \$109 for members and \$159 for non-members.
Limit 30 people.*

Careers. Aspirations. Respect.

Advancement

CREDENTIAL/CERTIFICATION COURSES AND EXAMS

Advance your expertise and career potential by obtaining a NEHA credential or certification at the AEC. You may choose to take just a credential/certification course, just an exam, or both a course and an exam while at the NEHA AEC. (Note: Only qualified applicants will be able to sit for an exam.)

Separate applications are required prior to registering for courses and exams. Additional fees also apply. For applications, deadlines to apply, and information on eligibility, visit neha2012aec.org/credentials.html.

Certified Professional of Food Safety (CP-FS)

Review Course: Tuesday, June 26, 8:00am–5:00pm & Wednesday, June 27, 8:00am–12:00noon

Cost: \$299 for members and \$399 for non-members, which includes the CP-FS Study Package (CP-FS Study Guide 2010 Edition, NEHA's Certified Professional Food Manager course book, 2005 and 2009 Food Code on CDs), a \$145 value. *Limit 36 people.*

Exam: Wednesday, June 27, 1:00–3:00pm

Registered Environmental Health Specialist / Registered Sanitarian (REHS/RS)

Review Course: Tuesday & Wednesday, June 26 & 27, 8:00am–5:00pm and Thursday, June 28, 8:00am–12:00noon

Cost: \$459 for members and \$559 for non-members, which includes the REHS/RS Study Guide, a \$179 value. *Limit 55 people.*

Exam: Friday, June 29, 8:00am–12:00noon

HACCP Manager Certification Course

Previous training with a minimum of Certified Professional Food Manager is highly recommended.

Review Course: Wednesday, June 27, 8:00am–5:00pm

Cost: \$249 for members and \$299 for non-members, which includes the NEHA textbook, HACCP: Managing Food Safety Hazards. *Limit 36 people.*

Exam: Thursday, June 28, 8:00–10:00am

NAWT Installer Training + NEHA CIOWTS Installer Exam (Basic)

Review Course: Wednesday, June 27, 8:00am–5:00pm. *Limit 40 people.*

Cost: \$299 for members and \$399 for non-members.

Exam: Thursday, June 28, 8:00am–12:00noon

CONTINUING EDUCATION CREDITS

Earn up to 24 hours of CE contact hours (enough to meet your full two-year NEHA professional credential requirement) by attending and participating in the NEHA AEC. CEs can be fulfilled by attending:

- Training and educational sessions
- The Keynote Address
- Pre-Conference Workshops
- Credential Review Courses
- Educational sessions via the Virtual AEC while they are being shown live on the Internet during the AEC or as an archive after the AEC is over

For specific information about obtaining CEs at the AEC, visit neha2012aec.org. CE units have also been related for correlating portions of the AEC from the American Association of Radon Scientists and Technologists (AARST); American Board of Industrial Hygiene (ABIH); and National Center for Healthy Housing (NCHH).

Attention California Registered Environmental Health Specialists:

NEHA is designated by the California Department of Public Health as a continuing education accreditation agency for Registered Environmental Health Specialists.

Fulfill your continuing education requirement by attending the NEHA 2012 AEC. Attending will count towards completion of your continuing education requirement with up to 24 CEs being awarded for attending the educational sessions and other events. To obtain CEs, a separate application and fee must accompany your AEC registration. For complete details, visit neha2012aec.org/CA_REHS.html.

Friends. Contacts. Connections.

Networking

At the NEHA AEC, network with not only your environmental health peers, but other experts and professionals from across government and related industries (such as retail food, onsite wastewater, and sustainability).



Strengthen your business and personal relationships to build a network of colleagues you can call on at anytime!

How can you network at the NEHA AEC?

- Set up meetings with people you'd like to meet before arriving the AEC by utilizing the **Virtual AEC** networking features
- Meet new people and enjoy time outside on the golf course during the **Golf Tournament** Wednesday afternoon
- Reunite with friends at the always-exciting **UL Event** on Wednesday night
- Connect with exhibitors that will help you be more productive in your job during the **Exhibition Grand Opening & Party** Thursday night, and during exhibit hall hours on Friday
- Collaborate with other environmental health professionals during policy discussions at the **NEHA Breakfast (sponsored by the National Restaurant Association) and Town Hall Assembly** on Friday morning
- While at the **Networking Luncheon** on Saturday, discuss with other environmental health professionals all that you've learned so far, and what you're excited to implement when you return to work
- During the final event of the AEC — the **President's Banquet** — reconnect with everyone you've met throughout the AEC and make a plan for staying connected (including using the Virtual AEC!)
- Stay connected to your friends and contacts after leaving San Diego using the networking features of the **Virtual AEC**

Perspective. Leadership. Excellence.

Motivation and Inspiration



The Awards Ceremony & Keynote Address will be held Thursday, June 28, 2012, from 1:00 to 2:50 pm.

"The future is truly a magical place. I have been there and would love to have you join me on my next journey."

– Thomas Frey

KEYNOTE SPEAKER

Be Motivated and Inspired by Senior Futurist, Thomas Frey



The keynote speaker is sponsored by NSF International.

As things continue to change across our communities, there are “new normals” emerging. So what will the future world of work – and a profession like environmental health – look like? Attend the Keynote Address at the NEHA 2012 AEC for answers as Frey’s presentation continues the discussion of “new normals” that began at the 2011 AEC, and explores where things are likely to go in the future.

Thomas Frey is Google’s top-rated futurist and author of “Communicating with the Future: How Re-engineering Intentions Will Alter the Master Code of Our Future”. He is Executive Director and Senior Futurist at the DaVinci Institute, and his keynote talks on futurist topics have captivated people ranging from high-level government officials to executives in Fortune 500 companies including NASA, IBM, AT&T, GE, Hewlett-Packard, Visa, Ford Motor Company, Lucent Technologies, Boeing, Capital One, Bell Canada, Times of India, Leaders in Dubai, and many more.

Frey’s presentation will motivate and inspire you with provocative knowledge, humor, and tantalizing information bits that you can immediately put to use to help environmental health be effective in our communities in the future.

SCHEDULE OVERVIEW

Tuesday // June 26	Wednesday // June 27	Thursday // June 28	Friday // June 29	Saturday // June 30
Pre-Conference Workshops	Pre-Conference Workshops	1st Time Attendee Workshop	Breakfast and Town Hall Assembly	Educational Sessions
Credential Review Courses	Credential Review Courses	Educational Sessions	Exhibition Open	Networking Luncheon
	Credential Exams	Awards Ceremony & Keynote Address	Poster Session	President’s Banquet
	Golf Tournament	Exhibition Grand Opening & Party	Silent Auction	
	Community Volunteer Event		Educational Sessions	
	Annual UL Event			

neha2012aec.org



Reasons Why

Attending the NEHA AEC Is a Wise Investment for You and Your Organization

Difficult times make it more important than ever that you NOT miss the skills, knowledge, and expertise that can be derived from the NEHA AEC, which can help you and your organization build for a better tomorrow.

1. The NEHA AEC is a unique opportunity for you to gain the skills, knowledge, and expertise needed to help solve your environmental health organization's daily and strategic challenges, and to make recommendations to help improve your bottom-line results.
2. NEHA's AEC is the most comprehensive training and education investment your organization can make all year.
3. Your attendance at the NEHA AEC is a solid investment in your organization that will result in immediate and longer-term benefits.
4. You can earn Continuing Education (CE) credit to maintain your professional credential(s).
5. NEHA provides a return on the investment made for you to attend the AEC.

Need additional reasons why you should attend?

Check out the videos on neha2012aec.org to hear what other environmental health professionals are saying about the NEHA 2012 AEC.

Enjoyment of the Destination

San Diego is a destination you don't want to miss! It is California's second largest city, where blue skies keep watch over 70 miles of pristine beaches and a gentle Mediterranean climate means paradise every day.

San Diego County's 4,200 square miles offer immense options for business and pleasure. San Diego is renowned for a dazzling array of world-class family attractions including the world-famous San Diego Zoo and San Diego Zoo Safari Park, Sea World San Diego, and LEGOLAND California. The city offers an expansive variety of things to see and do, appealing to guests of all ages from around the world!

Visit neha2012aec.org and click on "About San Diego" to plan how you're going to enjoy the NEHA 2012 AEC destination!



VIRTUAL AEC

Can't Make it to San Diego? Let the AEC Come to You!

NEHA recognizes that it can be difficult for environmental health professionals to attend the AEC in-person. At the same time, the complex nature of the work you do, the growing expectations of your employer, and the public demand require that you stay current with the developments in the field of environmental health. Don't let travel restrictions and budgets keep you from getting the training and education you need to be the best! Register for the Virtual AEC and attend the conference online instead.

Attending the AEC online provides you the opportunity to access the conference from your work or home computer where you can:

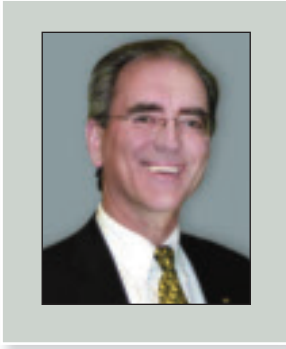
- View over 30 educational sessions **live** as they happen in San Diego
- Participate in sessions almost as if you were sitting in the room by submitting your questions via chat
- Network with other environmental health professionals, speakers, and exhibitors
- Access video archives of educational sessions, as well as, speaker presentations and other materials
- Earn continuing education credits

Sure, you don't get access to everything happening in San Diego, but the Virtual AEC is the next best thing for your training and education needs!

For details and to register for the Virtual AEC, visit neha2012aec.org/virtual_experience.html.

Already registered to attend the NEHA 2012 AEC in San Diego? The Virtual AEC is included in your registration as a free benefit. Once your registration is processed, you will receive an e-mail from admin@zerista.com inviting you to participate in the Virtual AEC. If you do not receive this e-mail, please contact NEHA Customer Service at 866.956.2258.

▶ MANAGING EDITOR'S DESK



Nelson Fabian, MS

As anyone who has been reading my columns lately knows—my focus has increasingly become centered on the future and more specifically, on what NEHA can do to help our profession (and its practitioners) succeed in that future.

To quickly recap how NEHA is seeing the world these days—

- Local government (where many of our members practice) has restructured itself to live within smaller budgets and in the process, many professions, including ours, have been downsized.
- That isn't going to change. Yelling and demanding more money—particularly at the federal level—isn't going to bring back public and environmental health jobs at the local level. (Our Center for Priority Based Budgeting—which essentially lives with local policy officials—confirms this reality for us.)
- Adding to this trend is the impact of baby boomers retiring and younger members of the workforce moving into different and higher paying professions (like software development). In other words, even if the funding was there to support a larger workforce, the people aren't.
- Despite general cutbacks, certain of our traditional programs continue to demonstrate strength—especially food safety. With global climate change adaptation becoming more prominent, it is reasonable to anticipate more funding support also developing for traditional programs in vector control and even water recreation. Activity in these traditional areas should help to dampen—though not forestall—the overall downsizing of the profession.

Peering Into the Future and Making It Happen!

My focus has increasingly become centered on the future and more specifically, on what NEHA can do to help our profession (and its practitioners) succeed in that future.

- IT holds the promise of fostering capacity gains in environmental health even as the number of people practicing in this profession declines. (This promise was a huge driver behind setting up our new cobranding initiative with Decade.)
- Though our overall traditional slate of programs is being downsized, environmental health has the potential to actually grow by evolving into new and more contemporary issues including the health effects of global climate change, healthy communities (and built environments), smart growth, and sustainability.
- NEHA can be a change accelerator by actively pushing to open these new doors that allow environmental health professionals to take advantage of these new branches on our profession's evolutionary tree.

- And we are doing just that!!

As I have emphasized over the last several months, our Center for Priority Based Budgeting is helping NEHA to forge new and constructive relationships with a host of other organizations that have historically flown outside of our environmental and even public health orbits. Chief among them have been the ICMA (International City/County Management Association) and the Alliance for Innovation (the society of local leaders who champion themselves as the leading edge for innovation in local government). These organizations are comprised of the people who run local government and who are therefore our ultimate bosses.

In fact, and as a result of our efforts, we were just invited by ICMA to prepare an article for their journal on the role of environmental health in sustainability. In short, ICMA has given us a golden opportunity to speak directly to the thousands upon thousands of city managers and county administrators, who today run local governments, about how our workforce can help them to meet their sustainability goals.

As I have explained in previous columns, we are now working with local leaders and helping them to develop their budgets. In the process, we get local leaders to identify why their communities even exist. Once we get them to clearly delineate their priorities, we also gain incredible insights into how environmental health can help community leaders to achieve them.

In these priority-setting exercises, safe and healthy communities along with sustainability almost always show up. (See last month's

continued on page 54



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- The Decade User Community is the largest online network of its kind. Health departments and Decade staff share information on a host of issues that impact their work. When someone wants to learn a better way they ask the community first.
- Decade Software is an active member of many associations and professional groups. We present at environmental health conferences around the country. We're advisors, helping to shape legislation and processes to unify the nation's efforts to improve environmental health.



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HEALTHSPACE
HARMONIZED INTELLIGENCE

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