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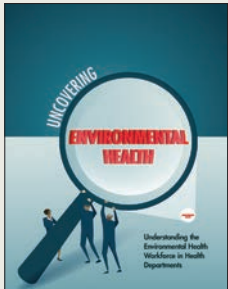
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Environmental Health

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Volume 81, No. 10 June 2019

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The *Journal* is very pleased to feature on this month's cover the published results from a groundbreaking initiative—Understanding the Needs, Challenges, Opportunities, Vision, and Emerging Roles in Environmental Health (UNCOVER EH). The Centers for Disease Control and Prevention, the National Environmental Health Association, and Baylor University partnered on this initiative to identify and describe key governmental environmental health workforce and practice elements. The UNCOVER EH initiative provides an understanding of the environmental health profession that has been lacking. Furthermore, the results provide a source of data to inform environmental health workforce development initiatives, improve the practice, and establish uniform benchmarks and professional competencies.

See page 24.

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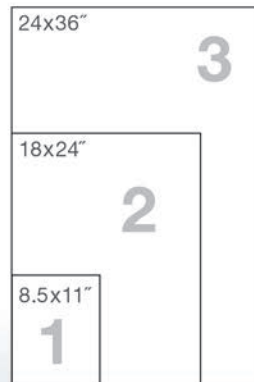


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Official Publication



Journal of Environmental Health
(ISSN 0022-0892)

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Published monthly (except bimonthly in January/February and July/August) by the National Environmental Health Association, 720 S. Colorado Blvd., Suite 1000-N, Denver, CO 80246-1926. Phone: (303) 756-9090; Fax: (303) 691-9490; Internet: www.neha.org. E-mail: kruby@neha.org. Volume 81, Number 10. Yearly subscription rates in U.S.: \$150 (electronic), \$160 (print), and \$185 (electronic and print). Yearly international subscription rates: \$150 (electronic), \$200 (print), and \$225 (electronic and print). Single copies: \$15, if available. Reprint and advertising rates available at www.neha.org/JEH. CPM Sales Agreement Number 40045946.

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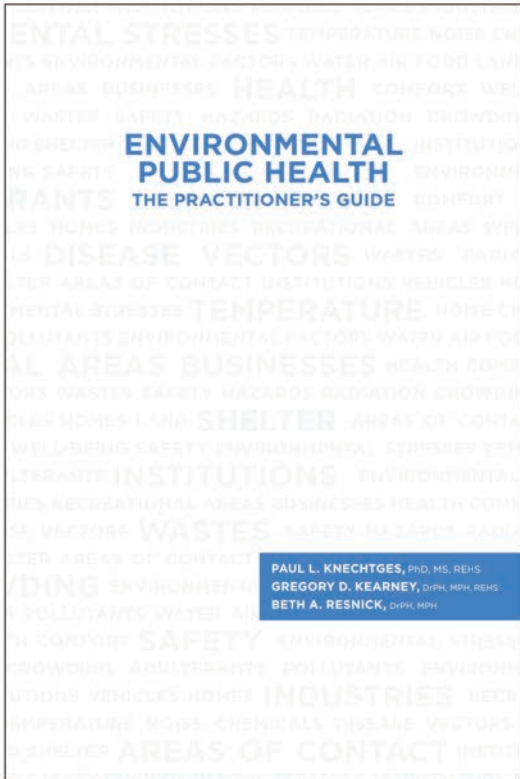
To submit a manuscript, visit <http://jeh.msubmit.net>. Direct all questions to Kristen Ruby-Cisneros, managing editor, kruby@neha.org.

Periodicals postage paid at Denver, Colorado, and additional mailing offices. POSTMASTER: Send address changes to *Journal of Environmental Health*, 720 S. Colorado Blvd., Suite 1000-N, Denver, CO 80246-1926.



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Environmental Public Health: The Practitioner's Guide

Edited by Paul L. Knechtges, PhD, MS, REHS

Gregory D. Kearney, DrPH, MPH, REHS

Beth A. Resnick, DrPH, MPH

ISBN: 978-0-87553-283-6
922 pages, Softbound, 2018

The environment has a profound effect on public health and this new text not only covers the theory and science behind environmental health but it also addresses real world issues faced by practitioners. The three parts of this book present a clear picture of the problems with solutions for practitioners. The structure, major tools of, and finally programs and services for environmental health. The systems approach this work takes will equip the next generation of environmental health leaders with the tools to tackle the most challenging issues of our generation.

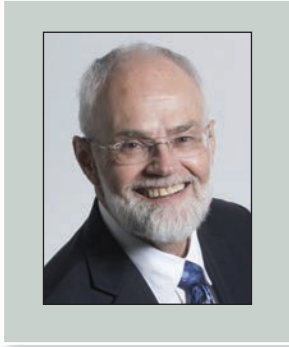
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► PRESIDENT'S MESSAGE



Vince Radke, MPH, RS,
CP-FS, DLAAS, CPH

Why? Is It Safe?

*Let us continue
to go far on this
journey together.*

I knew this column was my last even before Kristen Ruby-Cisneros, managing editor of our *Journal of Environmental Health*, e-mailed to let me know that my last column was due. Kristen, thank you for your patience and help in getting my columns out.

Questions

Two questions all environmental health professionals will be asked are, "Why and is it safe?"

As for the why question, you must be able to answer this question. Every day in your work people will ask it. Why are you taking this temperature? Why are you collecting a water sample? Why are you measuring this distance? Why do I have to clean this spill? Why are you doing that? The question of why will always be asked. The answer to the why question cannot be, "Because I'm the environmental health professional," "My boss told me," or "The law says so." Although the law might require you to take certain actions, the answer to the why question must have a scientific basis. An example would be, "I'm collecting a water sample to determine if there are pathogens in the water that might cause illness." If you cannot answer the why question based on science, you need to find the science and get the answer. Always be prepared to address the why question, especially in a public meeting or court room.

Most assuredly, the next question you will be asked, "Is it safe?" Is it safe to eat this food? Is it safe to drink the water? Is it safe to breathe the air? It is a simple question that is not always easy to answer. It requires a lot of knowledge and understanding on your part and possibly others to address this question.

The answer could be, "Yes, it is safe." Many times, however, your answer will be, "Yes, it is safe if you do this" or "Yes, it is safe if you don't do this." Sometimes the answer is, "It is not safe." You must then explain to people how they can keep themselves and their families safe to prevent illness or injury. As an environmental health professional, what are you doing to ensure their safety?

To add complexity to the safety questions are the economic factors that can come into play. The economic factors must be secondary to the safety factors.

Finally, your answer to the safety question might be that you don't know. You must then make every effort to determine if it is safe or not for people, which might require additional knowledge and resources from others. In some cases, even the additional resources might not be enough to determine if it is safe or not. If so, it is best to err on the side of caution, safety, and people's health. I leave you with a quote from George Bernard Shaw, the great literary giant, "The single biggest problem in communication is the illusion that it has taken place."

Change

I wish to draw your attention to the cover article of this month's *Journal*. Understanding the Needs, Challenges, Opportunities,

Vision, and Emerging Roles in Environmental Health (UNCOVER EH) was a collaboration between the Centers for Disease Control and Prevention (CDC), National Environmental Health Association (NEHA), and Baylor University. I wish to thank the three people most involved with this great effort and study: Dr. Bryan Brooks, Baylor University; Justin Gerding, CDC; and Elizabeth Landeen, NEHA.

I do not want to take away from your pleasure of reading the article and the complete study; however, I wish to highlight the changes, challenges, and opportunities that this article brings to our profession. The role of the environmental health professional is changing to meet the increasing demand of our critical services. The demographics of our profession are changing and will continue to evolve. The constant response to emergency situations requires flexibility and updated training to meet this challenge. The increased importance of the environmental health professional within the public health framework will require that we are properly equipped and trained to meet the future needs of people in our communities. The UNCOVER EH article offers an opportunity to assess if we are poised to meet the essential services of the communities we serve.

Another change will be the transition of the mantle of leadership to a new NEHA president at the end of our Annual Educational Conference & Exhibition in Nashville, Tennessee. Dr. Priscilla Oliver will take over the reins of our association. I have known and worked with Dr. Oliver for decades. She is a dedicated and hardworking environmental health professional who has held multiple leadership

positions. Over this past year we have worked together to bring about an association we can be proud of. I look forward to the next year with confidence under the leadership of Dr. Oliver. Please help me support and wish Dr. Oliver all the best in the next year.

Final Thoughts

I wish to thank you, our members, for allowing me to serve this past year as your president. I have tried to be a good steward of NEHA. It has been a humbling experience and a labor of love. I had the opportunity to visit many of our affiliates, exchange ideas, and learn from you.

I would be amiss if I did not praise our NEHA staff and Executive Director Dr. David Dyjack for the outstanding jobs they did this past year. They all went above and beyond

the call of duty. To the NEHA staff, a big THANK YOU!

My hat off to NEHA's board of directors—they exceeded my expectations. They visited many of our affiliates and worked behind the scenes on numerous committees and special projects. They made my job as president a lot easier.

I end with a quote that I have carried from office to office during my 49-year career. When the going got rough I would read this quote and get back to my work. The quote is from Theodore Roosevelt, 26th President of the United States:

It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and

sweat and blood; who strives valiantly; who errs, who comes short again and again, because there is no effort without error and shortcomings; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who neither know victory nor defeat.

Let us continue to go far on this journey together. 🐼

All the best,

Vince _____
President@neha.org

Did You Know?

Time is running out to participate in NEHA's Be a Beacon for Membership campaign. The campaign will end on June 15. The top five member recruiters will be announced at the end of June and will be honored at the UL Event at the 2019 AEC. Learn more at www.neha.org/nehabeacon.

SUPPORT THE NEHA ENDOWMENT FOUNDATION

The NEHA Endowment Foundation was established to enable NEHA to do more for the environmental health profession than its annual budget might allow. Special projects and programs supported by the foundation will be carried out for the sole purpose of advancing the profession and its practitioners.

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 1 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 call NEHA at (303) 756-9090. You can also donate online at www.neha.org/about-neha/donate.

Thank you.

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Vince Radke

Restaurant Manager Perceptions of the Food and Drug Administration's Newest Recommended Food Facility Inspection Format: Training and Words Matter

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University of Delaware

Jooho Kim, PhD
James Madison University

Barbara Almanza, PhD, RD
Purdue University

Abstract Restaurant food safety is monitored by local health departments through routine inspections. Given the historical use of different inspection formats, the purpose of this study was to assess how word choices used to categorize violations could influence restaurant manager interpretation of inspection results. This study used a scenario-based questionnaire to examine manager perceptions and preferences among inspection formats, including the three-tier system currently recommended by the Food and Drug Administration. Results suggest that managers were able to determine the relative seriousness of violations, but perceptions of risk were influenced by the words used to classify the violation. In particular, use of the words “priority foundation” and “core” as part of the three-tier violation format were confusing. Managers preferred the letter grade and numeric score systems because they were perceived to be easy to understand, easy to use, accurate, and require the least amount of time. Managers had some concerns about the new three-tier system in the area of accuracy. Results suggest the need for additional training for restaurant managers, especially on the meaning of different classifying terms when changing to a new inspection format, as well as the rationale and benefits of changing to a new system such as the three-tier format.

Introduction

Food safety in restaurants is monitored by local health departments through routine inspections as directed in the state's food code. For the past two decades, the Food and Drug Administration (FDA) has published its *Food Code* guidelines every 4 years with amendments every 2 years to assist states in the development of their food code and inspection system. The 2013 release of the *Food Code* marked its 20th anniversary (U.S.

Department of Health and Human Services, 2013). Recommended inspection format has changed with updates to the *Food Code*.

The versions from 2009 and 2013 detail a narrative inspection system that uses the words “priority,” “priority foundation,” and “core” to categorize violations (U.S. Department of Health and Human Services, 2009, 2013). This three-tier classification system was intended to replace the two-tier (“critical” and “noncritical”) narrative system and

was expected to offer improved distinctions on the risks associated with different violations and better support a risk-based inspection strategy (U.S. Department of Health and Human Services, 2013). The development of new violation names to more clearly designate violations was requested by the Conference for Food Protection in 2004. Subsequently, three violation terms that were ranked by risk were provided to the Conference for Food Protection in 2008 and then included in the 2009 *Food Code* as the three-tier classification system.

Word choices used to describe and categorize inspection violations can influence the perceptions toward and later responses to such violations; this phenomenon could be viewed as a framing effect. The framing effect is where decision-making results vary based on how the information or problem is presented and framed (Tversky & Kahneman, 1985). For example, different preferences for the same treatment have been observed because of the framing and whether it is presented in a positive way (e.g., curing disease) or a negative way (e.g., mortality). The framing effect explains how differences in word choice impact decision making and cognitive biases in human information processing (Takemura, 2014).

Similarly, changes in the words used to describe and categorize violations might be expected to result in a framing effect. Different names potentially could influence those interested in inspection results (inspectors, consumers, and restaurant managers) into forming different risk perceptions towards the same violation under the different systems.

TABLE 1

Respondent Characteristics (N = 370)

Characteristic	#	%
Sex		
Male	103	32.6
Female	213	67.4
Age (years)		
18–29	105	33.2
30–39	130	41.1
40–49	45	14.2
50–59	35	11.1
≥60	1	0.3
Education		
Less than bachelor's degree	255	70.6
Bachelor's degree	46	12.7
Higher than bachelor's degree	60	16.6
Region		
New England	20	5.4
Mid-Atlantic	44	12.0
East North Central	69	18.5
West North Central	29	7.8
South Atlantic	80	21.6
East South Central	22	5.9
West South Central	41	11.1
Mountain	26	7.0
Pacific	39	10.7
Restaurant type		
Full service chain	90	22.8
Full service independent	85	27.2
Quick service chain	94	30.0
Quick service independent	32	10.2
Others	12	3.8
<i>Note.</i> Total numbers do not always add up to 370 as some respondents chose to not answer all questions.		

In fact, one study has offered early evidence of such difference in perception in consumer groups (Kim, Ma, & Almanza, 2017) and one additional study confirmed different perceptions between inspectors and consumers (Ma, Kim, & Almanza, 2017). Few studies, however, have looked at restaurant manager perceptions of the different inspection systems.

Restaurant inspection reports convey important food safety information to res-

taurants and are a key aspect in the communication between regulatory officials and restaurant managers (Ma et al., 2017). How managers perceive inspection format and how they interpret the risks associated with different violations are critical issues because restaurant managers use their interpretation of the results in their decision making and their decisions have the potential to impact food safety (Läikkö-Roto & Nevas, 2014).

Furthermore, different inspection formats could potentially influence the use of inspection results because of changes in risk perception. Studies have found that narrative descriptions can elicit the strongest response or perception of risk (Choi, Miao, Almanza, & Nelson, 2013; Dunlop, Wakefield, & Kashima, 2010). On the other hand, some studies have suggested that the numeric and letter grade formats are simpler and easier to understand and use (Artz & Tybout, 1999; Bell, 1984; Dundes & Rajapaksa, 2001). Usability often refers to the levels of effectiveness, efficiency, and satisfaction of a system in supporting users to achieve their objectives (Albers & Still, 2010). Within the context of restaurant inspection systems, accuracy, ease of understanding, ease of use, and preferences are also considered relevant (Kim et al., 2017).

This study expands our understanding of the restaurant inspection system and proposes two research questions: 1) What are manager risk perceptions of violations under different systems? and 2) What are manager perceptions about different inspection systems (accuracy, ease of understanding, ease of use, preferences, and time required to use)?

Methods

Restaurant manager responses to a scenario-based questionnaire were gathered from an online Qualtrics panel survey to collect: 1) manager risk perceptions about violations under different inspection systems; 2) manager format preferences (including perceptions on accuracy, ease of understanding, ease of use, preferences, and time required to use); and 3) demographic information. Scenarios where violation descriptions with and without the coding word (used to classify the violation type, such as critical, noncritical, priority, priority foundation, and core) were used to assess how coding words impact manager risk perceptions.

Manager risk perceptions were assessed for three violations:

1. held beef stew without temperature control for more than 6 hr (classified as a critical violation under the critical/noncritical system and a priority violation in the three-tier format);
2. restaurant accepted food that was not properly frozen upon delivery (classified as a noncritical violation and a priority foundation violation); and

3. thawing frozen chicken under running water that is too warm (above 70 °F) (classified as a noncritical violation and a core violation).

All managers first saw violations without the coding word, then violation descriptions with the coding word were presented (e.g., critical, noncritical, priority, priority foundation, and core). This design allowed us to assess the impact of the coding word on manager risk perceptions. After approval from the institutional review board, an online invitation was sent in May 2017 to restaurant managers across the U.S. using Qualtrics Research Service. We collected 400 responses. Not all respondents answered all questions. After cleaning the data (by eliminating those who completed less than 50% of the survey and those who completed the survey in less than 1 min), we had 370 responses to use in data analysis. We analyzed the data with SPSS version 23, applying frequency tests, descriptive statistics, and *t*-tests.

Results

Demographic information is summarized in Table 1. Among the 370 respondents, there were more females (67.4%) than males (32.6%). The majority (74.3%) of the respondents were between 18–39 years old. Slightly more than half (52.8%) of the respondents worked in chain restaurants (both full service and quick service), while 27.2% of participants worked in independent full service restaurants and 10.2% of the participants worked for independent quick service establishments. The rest of the respondents worked for school food services or hotel restaurants. As to educational background, 70.6% of participants had received less than a bachelor’s degree, 12.7% had received a bachelor’s degree, and 16.6% held degrees higher than a bachelor’s degree. All regions were represented in the sample. More specifically, the representation of each region ranged from 5.4% (20 respondents) to 21.6% (80 respondents) based on the U.S. census (Table 1).

Restaurant Manager Risk Perception

Results from a number of paired *t*-tests (with and without the classifying term) indicated that manager perception of risk is highly influenced by the words used to classify the violations (Table 2). Interestingly, only when the term “critical” was added to describe and

TABLE 2

Restaurant Manager Risk Perceptions of Violations With and Without Coding Terms (Paired *t*-Test) (*n* = 322)

Violation Statement	Condition	Manager Perceived Risk		
		Mean (SD) ^a	df	<i>t</i>
1. Held beef stew without temperature control for more than 6 hr	Without critical	6.36 (1.12)	318	3.87 ^b
	With critical	6.60 (0.87)		
2. Restaurant accepted food that was not properly frozen upon delivery	Without noncritical	6.22 (1.24)	317	-14.51 ^b
	With noncritical	4.65 (2.03)		
3. Thawing frozen chicken under running water that is too warm (>70 °F)	Without noncritical	5.80 (1.55)	316	-10.58 ^b
	With noncritical	4.68 (2.08)		
1. Held beef stew without temperature control for more than 6 hr	Without priority	6.36 (1.12)	320	-2.69 ^c
	With priority	6.19 (1.17)		
2. Restaurant accepted food that was not properly frozen upon delivery	Without priority foundation	6.22 (1.24)	318	-4.01 ^b
	With priority foundation	5.99 (1.28)		
3. Thawing frozen chicken under running water that is too warm (>70 °F)	Without core	5.80 (1.55)	315	-3.35 ^b
	With core	5.53 (1.65)		

^a1 = not very serious and 7 = very serious.
^b*p* < .005.
^c*p* < .05.

TABLE 3

Restaurant Manager Risk Perceptions of Violations (*N* = 320)

System	Category	Manager Perceived Risk				
		<i>n</i>	Mean (SD) ^a	<i>t</i> -test	df	<i>t</i>
Two-tier	Critical	320	6.60 (0.87)	Critical versus noncritical	317	16.64 ^b
	Noncritical	319	4.65 (2.03)			
Three-tier	Priority	320	6.19 (1.17)	Priority versus priority foundation	319	2.85 ^b
	Priority foundation	319	5.99 (1.29)	Priority foundation versus core	315	5.12 ^b
	Core	37	5.53 (1.65)			

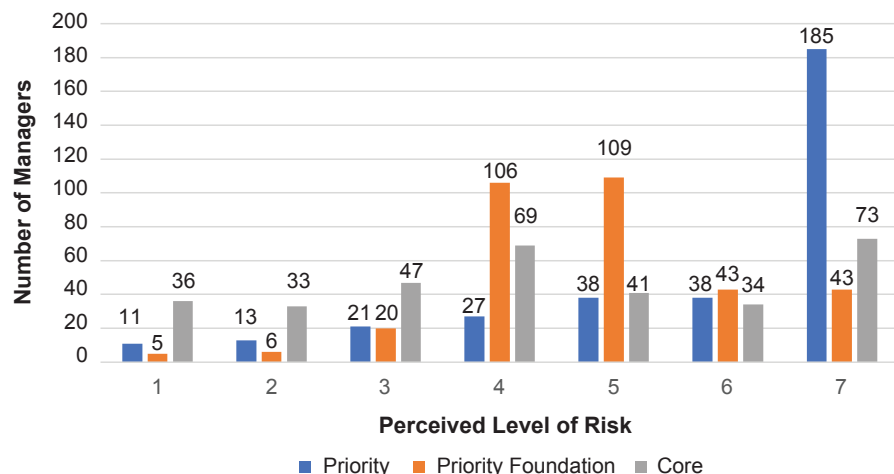
^a1 = not very serious and 7 = very serious.
^b*p* < .005.

classify violations did managers perceive the violation to be more serious and risky; when other classifying terms were added, risk perception/perception of seriousness decreased. Although the use of the words

noncritical and core might be expected to result in a less serious perception, a reduced risk was also found and was statistically significant when the term priority was added to the violation description, contrary to the

FIGURE 1

Risk Perception of Different Violation Categories Under the Three-Tier System (N = 332)



Note. 1 = low level of risk and 7 = high level of risk.

TABLE 4

Restaurant Manager Risk Perceptions of Violations Under Current Versus New Inspection System (Paired t-Test) (N = 322)

Violation	Classifying Term	Manager Perceived Risk			
		n	Mean (SD) ^a	df	t
Violation 1	Critical	320	6.60 (0.87)	319	-6.48 ^b
	Priority	320	6.19 (1.17)		
Violation 2	Noncritical	319	4.65 (2.03)	318	13.65 ^b
	Priority foundation	319	5.99 (1.29)		
Violation 3	Noncritical	44	4.68 (2.09)	314	8.87 ^b
	Core	37	5.53 (1.65)		

^a1 = not very serious and 7 = very serious.

^bp < .005.

intention for this top level of violation in the three-tier system (U.S. Department of Health and Human Services, 2013). When the term noncritical was added, the reduction in perception of seriousness was large (1.57 and 1.12 on a 7-point Likert scale for violations 2 and 3, respectively). The drop in risk perception was also statistically significant when the terms priority foundation and core were used. These results suggest

that these narrative systems, particularly the classifying terms, could be confusing to restaurant managers—if not misleading.

Regarding risk perception, in general, managers were able to determine the relative seriousness of different violations. For example, managers as a group placed the priority foundation violations between priority and core violations regarding the associated risks, as reflected in the mean scores of perceived

seriousness for each violation category (6.19 for priority, 5.99 for priority foundation, and 5.53 for core). In addition, t-test results indicated that manager general perceptions of risks associated with the three categories of violations were significantly different (Table 3). Similar results were also found in manager general risk perceptions of critical and noncritical violations. Overall, manager risk perceptions of critical violations were significantly higher than noncritical.

More specifically, if we look at how individual managers responded, 39% of managers (116 managers) incorrectly associated the highest amount of risk with either priority foundation or core violations, instead of the correct answer of priority violations (Figure 1). Further, even though managers as a group associated more risk on average with priority foundation violations (mean = 4.83) compared with core violations (mean = 4.32), almost a quarter (24%) of the managers perceived core violations (supposedly the least risky) to be at the highest level of risk. This finding indicated that as a total group, managers were able to associate appropriate amount of risk with different categories of violations. At an individual level, however, a large number of managers are still confused about the risk associated with different categories of violations. On the other hand, this confusion did not occur in the critical/noncritical system, as demonstrated by the 97% of managers who were able to determine the appropriate amount of risk associated with critical and noncritical violations.

In addition, when inspection systems were compared, managers perceived the same violations differently when the words used to classify the violation changed (Table 4). This finding further implies that managers can be heavily influenced by the violation category and their understanding of risk might not be based on the violation itself but rather the classifying term. Training, therefore, is needed to facilitate their understanding of inspection results, especially if a new system is going to be adopted.

The new three-tier system does help to communicate the importance of the violations better. As indicated in Table 3, classifying violations as priority foundation and core might convey higher risk than when the same violations are classified as non-

critical. In addition, when the classifying term changed from critical to noncritical, the drop in risk perception was 1.95 (on a 7-point Likert scale), while when the classifying term changed from priority to priority foundation, the drop in risk perception was only 0.2 (on a 7-point Likert scale). Obviously, the new classifying terms using priority, priority foundation, and core help to mitigate the issue that managers often associated noncritical as indicating unimportant in terms of violations.

Restaurant Manager Preferences Regarding Inspection Format

The largest number of managers (39%) preferred the letter grade system as their first choice. It was considered the easiest to understand and use (Table 5). The numeric score system closely followed, with 35% (112) of managers selecting it as the first choice. Slightly less than 5% (15) of the managers picked the three-tier system as their first choice. Narrative systems (both critical/noncritical and the three-tier system) were perceived to be harder to understand and use, but the critical/noncritical system was regarded as more accurate than the letter grade system (Table 5).

A closer look at the distribution of the data revealed that managers indeed preferred the letter grade and numeric score systems; they indicated that these two systems, in their opinion, performed best in easiness to understand, easiness to use, accuracy, and time required to use (Table 5). Even though managers thought they would spend more time reading and trying to understand the three-tier system, they still did not consider it to be as accurate as the other systems. Managers considered the numeric system to be the most accurate, followed by the critical/noncritical system.

Overall, managers preferred the letter grade system, as it was thought to be the easiest to understand and use, as well as requiring the least amount of time to use. The newest format (the three-tier system) was the least favored format among managers because it was the least easy to understand and use, required the longest time to read, and was perceived to be the least accurate. Manager preferences (based on all four criteria) were the letter grade format, followed by the numeric score, then the critical/non-

TABLE 5
Restaurant Manager Perceptions of the Different Inspection Formats (N = 330)

Inspection Format	Perception			
	Easiness to Understand	Easiness to Use	Accuracy	Time Required to Use
	Mean ^{1,2} (SD)	Mean ^{1,2} (SD)	Mean ^{1,3} (SD)	Mean ^{1,4} (SD)
Letter grade	6.48^a (1.13)	6.27^a (1.29)	5.40 ^a (1.77)	5.30^a (2.05)
Numeric score	6.29 ^a (1.27)	6.18 ^a (1.32)	5.64^a (1.57)	5.19 ^a (2.03)
Critical/noncritical	5.48 ^b (1.60)	5.62 ^b (1.51)	5.55 ^a (1.42)	4.33 ^b (1.90)
Priority/priority foundation/core	4.11 ^c (1.76)	4.46 ^c (1.73)	4.85 ^b (1.68)	3.41 ^c (1.83)
Analysis of variation (ANOVA)				
df	1,303	1,310	1,305	1,307
F	177.66	104.02	15.86	66.42

Note. Bolded values indicate the highest score for each perception.
¹Numbers within a column with different superscript letters are significantly different using Tukey comparisons at $\alpha = .05$. For example, means with "a" are significantly different from means with "b" while means with the same letter are not significantly different.
²1 = not very easy and 7 = very easy.
³1 = not very accurate and 7 = very accurate.
⁴1 = long amount of time and 7 = short amount of time.

critical system, and finally the priority/priority foundation/core system (Figure 2).

Discussion and Conclusion

Results of this study suggested that as professionals, managers as a group have a good understanding of the risks associated with different violations. Individual managers, however, appeared to be strongly influenced by the words used to describe and classify violations. The word critical amplified the perceived seriousness of a violation when it was presented in the description. On the other hand, the term noncritical significantly reduced the risk perception of a violation. Surprisingly, the term priority reduced the risk perceived to be associated with that violation. In addition, use of priority foundation and core lowered manager perception of risks, but risk perception was still higher than when the term noncritical was used.

Results show that managers are influenced by the word used to describe a violation even when a description of the violation is provided. Unfortunately, when managers did not correctly understand the word used to describe the violation, they did not correctly

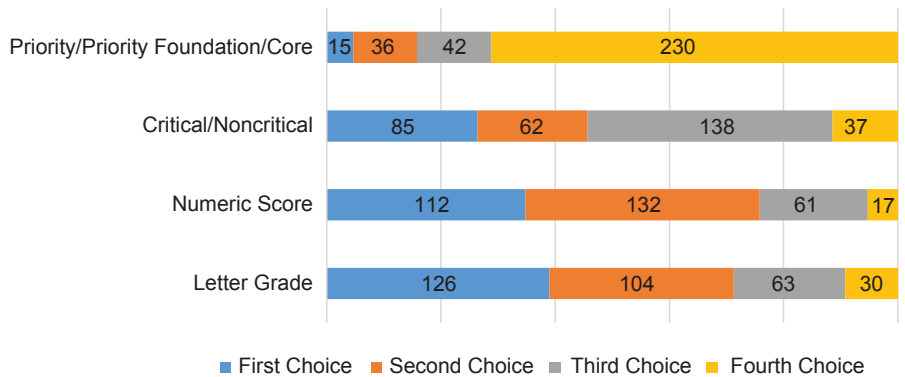
understand the relative risk associated with that type of violation. Clearly, the words that were used did matter to restaurant managers. When comparing different formats, the three-tier system seemed to better convey the serious nature of even lower-level violations compared with other systems. Classifying the violation as a priority foundation or core violation made managers think such violations were more serious than when the same violation was classified as noncritical.

In regard to inspection formats, managers clearly preferred scoring systems (e.g., letter grade or numeric score) over narrative systems (two-tier and three-tier systems). The two narrative systems were thought to be the least easy to use and understand and were expected to take the greatest amount of time to use. Despite these factors, managers appeared to support inspection systems and the importance of food safety in that they wanted consumers to know about the inspection results.

This study is not without limitations. For example, a longitudinal study comparing results before and after implementation of different systems might yield more meaningful insights. In addition, this study

FIGURE 2

Inspection Format Preferences of Restaurant Managers as Shown by the Number Selecting the Format as Their First, Second, Third, or Fourth Choice



looked at only restaurant manager perceptions. A comparison of the groups that might use the inspection systems, such as restaurant managers, consumers, and health inspectors, would offer a more balanced perspective on the use of different formats. Finally, although the different formats were described in the introduction of the survey, inspection formats would likely be best understood by those who have actually seen them in use. Unfortunately, it was not thought to be practical or possible to survey

only restaurant managers who had seen all of these inspection formats.

This study, as the first to examine restaurant manager perceptions towards different restaurant inspection systems, can offer useful information to state health departments and FDA when designing or implementing inspection systems. This study also supplies evidence on how interpretation and risk perception of restaurant inspection results can be influenced by the words used to describe violations and thus provides evidence to the

applicability of framing effect in the food safety context.

In summary, the inclusion of a term used to classify violations into categories influenced manager perceptions beyond the narrative descriptions. The use of specific words to describe violations did matter. Although most, if not all, health departments typically offer training, informational seminars and workshops designed for restaurant managers would help them in understanding a new inspection format. This study provides useful information in that it suggests that the words used to describe violations are not always intuitively understood.

Intuitive understanding is even more compromised when working with restaurant managers whose native language is not English. Such misinterpretations can impact inspectors in their communications with restaurant managers. Both the words used and training on an inspection format are important for inspectors to effectively communicate inspection results to restaurant managers. Clearly, coding words are important and influence restaurant manager risk perceptions; as such, additional support to restaurant managers such as training and education in the process of adopting a new inspection format is critical. 🐼

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References

Albers, M., & Still, B. (Eds.). (2010). *Usability of complex information systems: Evaluation of user interaction*. Boca Raton, FL: CRC Press.

Artz, N., & Tybout, A.M. (1999). The moderating impact of quantitative information on the relationship between source credibility and persuasion: A persuasion knowledge model interpretation. *Marketing Letters*, 10(1), 51–63.

Bell, A. (1984). Language style as audience design. *Language in Society*, 13(2), 145–204.

Choi, J., Miao, L., Almanza, B., & Nelson, C.D. (2013). Consumers' responses to restaurant inspection reports: The effects of information source and message style. *Journal of Foodservice Business Research*, 16(3), 255–275.

Dundes, L., & Rajapaksa, S. (2001). Scores and grades: A sampling of how college students and food safety professionals interpret restaurant inspection results. *Journal of Environmental Health*, 64(5), 14–19.

Dunlop, S.M., Wakefield, M., & Kashima, Y. (2010). Pathways to persuasion: Cognitive and experiential responses to health-promoting mass media messages. *Communication Research*, 37(1), 133–164.

Kim, J.H., Ma, J., & Almanza, B. (2017). Consumer perception of the Food and Drug Administration's newest recommended food facility inspection format: Words matter. *Journal of Environmental Health*, 79(10), 20–25.

Läikkö-Roto, T., & Nevas, M. (2014). Restaurant business operators' knowledge of food hygiene and their attitudes toward official food control affect the hygiene in their restaurants. *Food Control*, 43, 65–73.

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References *continued from page 13*

Ma, J., Kim, J.H., & Almanza, B. (2017). Inspector perceptions of the Food and Drug Administration's newest recommended food facility inspection format: Training matters. *Journal of Environmental Health*, 79(10), 26–31.

Takemura, K. (2014). The framing effect of decision making. In *Behavioral decision theory* (pp. 103–114). Tokyo, Japan: Springer Nature.

Tversky, A., & Kahneman, D. (1985). The framing of decisions and the psychology of choice. In V.T. Covello, J.L. Mumpower, P.J.M. Stallen, & V.R.R. Uppuluri (Eds.), *Environmental impact assessment, technology assessment, and risk analysis* (Vol. 4, pp. 107–129). Berlin/Heidelberg, Germany: Springer Nature.

U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration. (2009). *Recommendations of the United States Public Health Service Food and Drug Administration: Food Code*. Washington, DC: Government Printing Office. Retrieved from <https://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm2019396.htm>

U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration. (2013). *Recommendations of the United States Public Health Service Food and Drug Administration: Food Code*. Washington, DC: Government Printing Office. Retrieved from <http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm374275.htm>

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► SPECIAL REPORT

Food Donation and Food Safety: Challenges, Current Practices, and the Road Ahead

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Abstract Millions of pounds of food are donated annually from grocery stores, restaurants, and other sources through thousands of food assistance agencies. Few local health departments have both the legal authority and resources to assure food safety in this highly decentralized network. A number of communities are using innovative public-private partnerships to improve donated food safety even in the absence of legal authority or significant new resources. These approaches begin with an understanding of the local food donation network, then progress to finding opportunities to create benefits for network members and seeking food safety improvements from network members.

Local health department leadership is needed to improve food donation safety programs. This involvement could include coordinating the variety of privately-based food safety inspections currently taking place and exploring funding opportunities through the tax savings enjoyed by food donors. This special report provides an overview of food donation networks and the food safety challenges common to many communities. It then explains some of the innovative programs being implemented in communities. Finally, we highlight opportunities for developing comprehensive food donation safety programs in the absence of significant new resources or legal authority.

Introduction

Over 12% of the U.S. population was food-insecure in 2015 (World Hunger Education Service, 2018). Risks to the food-insecure include not only hunger and malnutrition but also the consequences of having to choose between using limited funds for food or other needs, such as housing, healthcare, or transportation (Bartfeld & Collins, 2017; Nielsen, Garasky, & Chatterjee, 2010; Patton-Lopez, 2012). Food insecurity has been associated with increased risk of poor health and hos-

pitalization, and possibly psychological and behavioral disorders among children (Feeding America, 2016).

Most communities have developed a network of organizations to identify surplus food and make it accessible to those in need (Daponte & Bade, 2006). Much of this food is shelf-stable and handled by large organizations with significant resources devoted to food safety. Some of the most nutritious food, however, is perishable, including foods that are time/temperature controlled for safety

(TCS). In a single community, this food might be handled by over 100 small charitable organizations with limited food safety knowledge or resources (M. Hoffman, personal communication, July 26, 2017).

Establishing and managing public health programs to assure food safety throughout a local food donation network is a daunting task. Yet, lack of a food safety system not only increases the risk of foodborne illness but also can reduce food availability if potential donors consider food donation too risky.

This special report summarizes the importance—as well as the challenges—facing local health authorities in establishing food safety systems for food donation, highlights some of the promising practices found in U.S. communities, and suggests strategies for moving forward.

Furthermore, it addresses three questions:

1. What is the basic structure and function of the food donation network operating in most communities?
2. What role do local health departments typically play in this network and why?
3. What are the most promising opportunities for local health departments to improve food safety in the food donation network, even in the absence of legal authority and funding?

Relatively little work has been published on local food donation networks and food safety or the role of local health departments. To begin to answer the research questions above, we conducted an exploratory qualitative research study through interviews and site visits with experts and key stakeholders across the U.S. We hope that this initial work will lead to additional research and policy to improve food donation networks.

Local Food Donation Networks

The commercial food system begins with those who grow, process, and distribute our food (Figure 1). Finally, food reaches the retail level, which can include grocers, restaurants, institutional food services (schools, hospitals, etc.), and others. Surplus food can occur at any stage in this system.

Surplus food prior to the retail level generally occurs in large quantities (by the pallet load or truckload) and typically is collected and stored by large food banks (Bazerghi, McKay, & Dunn, 2016). Feeding America (www.feedingamerica.org) is a network of more than 200 food banks covering the entire U.S. but many independent food banks also exist. Food banks generally do not distribute food directly to the public but distribute to food assistance organizations (commonly referred to as agencies) that serve food-insecure populations. Agencies may operate grocery programs (pantries) and/or meal programs (soup kitchens, shelters, etc.). Food banks might deliver food to the agencies or agencies might travel to a food bank to retrieve the food.

At the retail level, surplus food often occurs in smaller quantities at individual retail outlets, making collection and transportation less cost-effective. Food banks might pick up surplus food from large grocery stores but pick up from other retail outlets is less common. As a result, smaller grocery stores, restaurants, and institutions that wish to donate food typically donate directly to agencies. Agencies often use volunteers to collect surplus food from retail outlets.

Food Safety Best Practices and Ongoing Challenges

There is abundant guidance on best practices in protecting the safety of donated food. For example, the Conference for Food Protection (2016) published the *Comprehensive Resource for Food Recovery Programs*. Feeding America has created a detailed guidance document on donated food safety to be used in conjunction with ServSafe's *Food Handler Guide for Food Banking* (Feeding America, n.d.; National Restaurant Association, n.d.). The U.S. Department of Agriculture (USDA) also has food safety requirements for food banks and agencies receiving government-purchased commodities (see 7 C.F.R. 250 and 251). Harvest Support Network (<http://harvestsupportnetwork.org>) is a nonprofit

created by the Food Donation Connection to provide food safety training materials, including videos, for organizations and individuals involved in food donation (J. Larson, personal communication, July 12, 2017).

Despite the extensive guidance available, most local food donation networks still face significant food safety challenges. To better understand these food safety challenges, consider the movement of donated foods from restaurants directly to food assistance agencies. Below we describe seven typical steps in the food donation process, from retail outlet to pantry. Steps 1–2 take place within the donor's facility, step 3 in the transport vehicle, and steps 4–7 at the pantry. This list is not meant to be exhaustive but rather highlights critical steps common to food donation. Some food safety concerns at each step are noted.

- 1. Identify surplus food:** When a food item is no longer appropriate to be served or sold, it must be determined whether the item is safe to donate or whether it must be discarded. This decision is not simple and can involve judgments about expiration dates, how the food has been held, and whether it will be frozen prior to donation. Receipt of unsafe or unfit food is a common problem reported to us by pantries.
- 2. Repackage/label/store:** If not prepackaged, all items must be labeled as to the contents, package date, and discard date (if appropriate). Some food items are in bulk quantities and should be repackaged ideally to a size appropriate to a pantry. Food should be held at the proper temperature, without risk of contamination, and clearly indicated for donation. Failure in all of these areas have either been observed by the authors or reported to us by pantries.
- 3. Retrieve and transport:** Transportation is a critical step. Time/temperature control and contamination are significant challenges. Many pantries send volunteers, using their own vehicles, to pick up donated food. Donors have reported to us that places sometimes refuse to donate at the time of pick up because of the condition of the vehicle interior. Appropriate measures for time/temperature control are unclear. Some donors argue that only refrigerated vehicles should be used for TCS foods. Starbucks, for example, has provided grants to some communities to assure that refrigerated vehicles are used to pick up TCS foods from

their stores (B. Edean, personal communication, August 3, 2017). Others argue that the frequent openings necessary for food pick up at multiple stops make refrigerated vehicles ineffective. Food Donation Connection allows for pick up in a nonrefrigerated vehicle provided the food is kept in coolers under ice packs (J. Larson, personal communication, July 12, 2017). Yet, some agencies argue that keeping trips short—under 15 min—is the best way to transport TCS foods. Time/temperature logs from pick up to delivery seem essential but evidence suggests that many pantries do not keep such logs.

- 4. Receive and assess:** Upon receipt at the pantry, food should be checked to assure it is safe for consumption. As noted above, unsafe or unfit food is not uncommon. There seems to be considerable confusion about the meaning of expiration dates and how long after expiration it is typically safe to consume various foods.
- 5. Repackage/label/store:** Cold storage is a concern, as many pantries do not have commercial refrigeration equipment and adequate equipment temperature logs often are not maintained. Some pantries are open only once per week and culling expired inventory can be lacking. Pantries sometimes repackage bulk foods that were not repackaged by the donor. We observed facilities for repackaging ranging from clean rooms with sinks and gloves to card tables set up within the pantry traffic pattern.
- 6. Display:** Even if a pantry has adequate cold storage, it might not have cold display equipment to use during the hours the pantry is open. As a result, TCS foods might be displayed at room temperature, relying on staff to rotate food items back into storage before they have been out too long.
- 7. Reassess:** After pantry open hours, remaining foods must be assessed to determine if they will still be safe to consume the next time the pantry is open. Some pantries have reported to us that they get food donations from other pantries that no longer want to hold the food. Starbucks mandates that pantries receiving their TCS foods cannot donate the food to any other pantries and must discard the food if it was displayed without proper refrigeration (B. Edean, personal communication, August 3, 2017).

Inspection and permitting of agency facilities vary greatly by local and state jurisdiction and depend on legal exemptions, interpretation of terms such as food service establishment, and available resources. Some locations permit and inspect all food assistance agencies that handle perishable foods. More commonly, permitting and inspection are limited to those agencies preparing meals. Permitting fees frequently are waived. A systematic review of state legal requirements for donated food is currently underway at the Food Law and Policy Clinic at Harvard Law School (Blazek et al., 2016).

Alternative Models

We define a food donation safety program as follows: A community-wide system to assure the safety of all food distributed through the local food donation network. We are not aware of any one model that has resolved all donated food safety issues or that would be appropriate for all communities. Instead, we have found a variety of programs being tried in different communities based on their available resources, legal authority, and other local factors. We have organized these programs into four general groups, which we recognize is not an exhaustive accounting of the types programs being used in communities—even within one model, individual programs can vary considerably.

We propose the criteria in Table 1 for evaluating alternative models for food donation safety programs. The four models are discussed using these criteria. The second evaluation criterion—food safety expectations are responsive to the needs of the food-insecure—is not discussed further because it is relatively independent of the model being evaluated. Instead, this second evaluation criterion depends upon the food safety requirements adopted, regardless of the model being used.

Hands-Off or Kitchen-Only Model

This model appears to be the most common one found in U.S. communities. In some communities, donated food and the organizations that handle the donated food are (or are thought to be) exempt from local health department regulation. In some other communities, only organizations that prepare meals from donated food are considered subject to regulation and are permitted and inspected by local health authorities. Meal

TABLE 1

Criteria for Evaluating Alternative Models for Food Donation Safety Programs

Criteria	Notes
Food safety programs include practices known to be effective	Should be based on food safety guidance documents described in the text.
Food safety expectations are responsive to the needs of the food-insecure	Lack of food for the food-insecure poses its own set of public health risks. Food safety practices that make a small improvement in donated food safety but result in a large reduction in food availability could aggravate public health risks rather than reduce them. Thus, some practices expected in commercial food service establishments might not be appropriate for donated food (e.g., equipment standards, food expiration dates, etc.).
Food safety conditions and practices are reasonably verified and enforced by unbiased parties	Given limited resources and legal authority, verification and enforcement by organizations other than the local health department should be considered.
Requires resources consistent with those locally available	
Food safety programs improve the food donation network	The decentralized nature of local food donation networks limits effectiveness. Some food safety programs can reduce these problems.

programs pose a number of important food safety risks; however, they generally represent a minority of donated food and therefore affect a small proportion of the food-insecure population (P. Turner, personal communication, July 24, 2017).

A hands-off program would not advance best practices for food safety. A kitchen-only program would assure best practices through inspection and enforcement in meal program agencies but would not address other components of the food donation network. Neither approach would help improve donation network function.

Universal Inspection Model

Health department permitting and inspection of all organizations involved in food recovery are very resource intensive. While we are aware of local governments that take this approach, we believe that relatively few have the resources for this model, especially if permitting fees are waived for these organizations. This approach could significantly advance best practices for food safety but would not, on its own, improve donation network function.

Coordinating Council Model

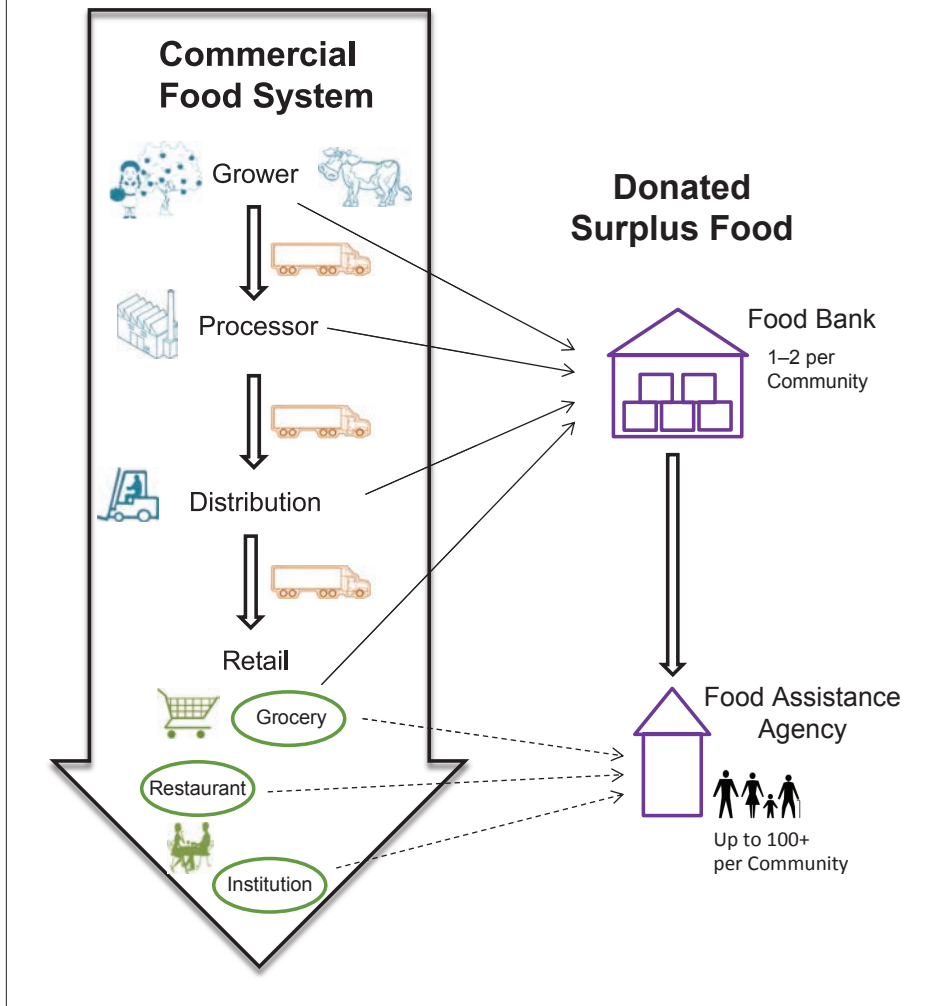
A few communities have created new organizations that attempt to offset problems caused

by the highly decentralized nature of the food donation network. We call this approach the Coordinating Council Model because the organization generally is composed of representatives from organizations in the food donation network, local government officials, and food-related businesses. Two examples from this model are the Waste Not OC Coalition in Orange County, California (www.wastenotoc.org) and the Food Rescue Partnership in the Quad Cities of Iowa/Illinois (<https://foodrescueqc.org>). Both were created as part of local health department initiatives (Garcia-Silva, Handler, & Wolfe, 2017; L. Hensel, personal communication, June 30, 2017).

These councils benefit the local food-assistance agencies, which provides the councils with leverage to improve food safety. Council activities include providing outreach to the food-insecure to help connect them with agencies in their area. This assistance often includes producing printed and online maps of agency locations and capabilities. The Waste Not OC Coalition provides outreach to area physicians to perform food-insecurity screenings of their patients and refer patients to local agencies (Garcia-Silva et al., 2017). The coalition also provides outreach to local government entities to improve coordination between local governments and local agencies. These coor-

FIGURE 1

A Typical Local Food Donation Network



ordinating councils include local health departments; therefore, health inspectors have begun providing information to area food establishments on the legality and benefits of donating surplus food (E. Bradley, personal communication, July 6, 2017; M. Haller, personal communication, July 21, 2017). The Food Rescue Partnership also provides a 15-min presentation on food donation as part of the food safety training course taken by restaurant managers. The Waste Not OC Coalition includes major food distributors in the coordinating council. These companies are often aware of untapped resources in the community, such as used refrigeration equipment that can be donated to food assistance

agencies (M. Haller, personal communication, July 21, 2017).

These benefits provided to local agencies give coordinating councils leverage with regard to food safety. For example, the Waste Not OC Coalition requires that all agencies listed in their materials must agree to follow a set of food safety procedures and undergo inspections by volunteer inspectors who have been trained by the Waste Not OC Coalition (M. Haller, personal communication, July 21, 2017). Local health inspectors also provide food safety training to agency personnel.

In fact, food safety is the top priority at the Waste Not OC Coalition. Mike Learakos,

executive director, stated the primary mission as “protecting the brand of food donors” (M. Learakos, personal communication, July 31, 2017). Federal and state law provides legal liability protection to donors against any subsequent food safety claims but publicity related to possible illness from donated food could be devastating to the brand name of a restaurant or grocery chain. Learakos sees a systematic food safety program for donated food as the best way to maintain and increase food donation.

With regard to our evaluation criteria, the coordinating council model has the potential to score well on providing best food safety practices and on verification/enforcement, if required of participating agencies and if the benefits to agencies are sufficient to incentivize them to participate. Basic coordinating councils require relatively few resources because council members generally are not compensated. Developing outreach materials or hiring staff, however, would require additional resources. If the use of trained volunteers to perform food safety inspections proves effective, this option would be a low-cost solution. One of the greatest benefits of the coordinating council model is its potential to strengthen the food donation network through improved communication and coordination; outreach to food-insecure populations, government, and potential food donors; and mobilization of untapped resources.

Small-Load Logistics Organization Model

As indicated in Figure 1, food donation pick up from restaurants and smaller grocery stores typically is performed by individual agencies with volunteers who frequently use their own vehicles. This method is also the way many agencies obtain food from food banks. This method represents a critical food safety risk as volunteers are often untrained, have few available resources to maintain food safety, and vehicles and procedures are generally not inspected. The decentralized and uncoordinated food logistics process can also be a significant barrier to food donation due to its complexity and lack of reliability (Food Shift, 2015; Natural Resources Defense Council, 2017).

A few communities have responded to these challenges through formation of an organization specializing in logistics for small loads of donated foods (in contrast to the pallet- or truck-size loads collected by food banks).

Table-to-Table of Iowa City, Iowa, has operated since 1996, providing pick ups from area grocery stores and restaurants and delivering the food immediately to area agencies (<https://table2table.org>). Table-to-Table has their own vehicles, some of which are refrigerated, and provides their volunteer drivers with food safety training (N. Ross, personal communication, July 13, 2017). Food Finders (www.foodfinders.org) in the greater Los Angeles area performs similar services but most pick ups are made by their trained volunteers using personal vehicles (P. Larson, personal communication, August 2, 2017). Almost all donated food is delivered to an agency within 5 miles.

In addition, the benefit to local agencies provides some leverage to promote food safety. Food Finders, for example, requires all participating agencies that have staff working in food banks and food recovery to have one staff member who is a certified food handler (P. Larson, personal communication, August 2, 2017). While we are not aware of a small-load logistics organization that requires inspections of their participating agencies, Table-to-Table does help their agencies prepare for inspections from their local Feeding America food bank (N. Ross, personal communication, July 13, 2017).

With regard to our evaluation criteria, the small-load logistics organization model has the potential to score well on implementing best food safety practices in food logistics. It can also promote best practices among agencies through requirements such as food safety certified personnel. Inspection and enforcement could also be made a requirement for participating agencies. The resources to operate a logistics organization, however, can be substantial, especially if dedicated vehicles are owned and operated. These resources must either be obtained by charging agencies for food or from philanthropic donors—many of whom might be the same donors being approached by agencies. While not as comprehensive as coordinating councils,

small-load logistics organizations can help improve the food donation network through opportunities for better communication and cooperation among agencies and as a point of contact for local government.

Conclusion and Recommendations

Even though this research was exploratory, a number of useful conclusions can be drawn.

- Local food donation networks tend to be highly decentralized and operate on extremely limited budgets. These conditions contribute to food safety risks.
- There is ample guidance on food safety practices relevant to local food donation networks.
- Leadership of the local health department in assuring food safety and improving the local food donation network appears to be the exception rather than the rule.

Assuring the safety of food donation networks is challenging but local health departments must take the lead. In the absence of funding and clear legal authority, this leadership will require innovation and local team building. Fortunately, a few communities have created model programs that can be adapted and improved by health departments across the country. The coordinating council and small-load logistic organization models demonstrate that food safety conditions can be improved without new legal authority and with little or no new government funding. These models still have shortcomings, though, particularly in the areas of inspection/enforcement and increasing private funding.

Many food donation agencies (pantries, shelters, etc.) might already be inspected by other organizations such as USDA, USDA-delegated state agencies, food banks, or other private organizations (such as Food Donation Connection). What is missing is local health department oversight of this process. It could be possible for the health department to routinely receive copies of inspection reports as part of the requirements for agencies to par-

ticipate in coordinating council, small-load logistics, or other programs.

It could also be possible to increase funding for food safety through private donors. Food donation can have substantial financial benefits to donor companies. Federal tax law provides enhanced deductions to create strong incentives for companies to donate surplus food (Broad Leib, Rice, Balkus, & Mahoney, 2017). For example, Food Donation Connection assists restaurants and other food retailers to safely and conveniently donate their food locally and is paid by receiving a share of the tax savings accruing to the donor (J. Larson, personal communication, July 12, 2017). Donors might be willing to share a portion of tax savings once convinced of the “brand protection” benefits from an improved food donation network.

We strongly encourage local health departments to take a leadership role in their local food donation network. We suggest the following action items.

1. Clarify your legal authority.
2. Connect with your local food donation network. Your local food banks are a good place to start. Contact Food Donation Connection to see what restaurants in your area donate and who collects the food. Ask grocers to whom they donate.
3. Determine which agencies are inspected, how often, by whom, and using what evaluation criteria. Is there a written record of each inspection?
4. Discuss with key stakeholders in the food donation network about developing a coordinating council, small-load logistics organization, or other model for improving food safety as well as improving network function. 🐾

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References

Bartfeld, J., & Collins, J.M. (2017). Food insecurity, financial shocks, and financial coping strategies among households with elementary school children in Wisconsin. *The Journal of Consumer Affairs*, 51(3), 519–548.

Bazerghi, C., McKay, F.H., & Dunn, M. (2016). The role of food banks in addressing food insecurity: A systematic review. *Journal of Community Health*, 41(4), 732–740.

References

- Blazek, K., Balkus, O., Leib, E.B., Civita, N., Maley, M., Nuckolls, K., & Zhua, S. (2016). *Federal enhanced tax deduction for food donation—A legal guide*. Retrieved from <https://www.chlpi.org/wp-content/uploads/2013/12/Food-Donation-Fed-Tax-Guide-for-Pub-2.pdf>
- Broad Leib, E.M., Rice, C., Balkus, O., & Mahoney, J. (2017). *Keeping food out of the landfill: Policy ideas for states and localities*. Presented at the Midwest Food Recovery Summit, Des Moines, Iowa, September 6, 2017. Retrieved from https://www.chlpi.org/wp-content/uploads/2013/12/Food-Waste-Toolkit_Oct-2016_smaller.pdf
- Conference for Food Protection. (2016). *Comprehensive resource for food recovery programs*. Retrieved from <http://www.foodprotect.org/media/guide/comprehensive-resource-for-food-recovery-2016-version.pdf>
- Daponte, B.O., & Bade, S. (2006). How the private food assistance network evolved: Interactions between public and private responses to hunger. *Nonprofit and Voluntary Sector Quarterly*, 35(4), 668–690.
- Donation of Foods for Use in the United States, Its Territories and Possessions and Areas Under Its Jurisdiction, 7 C.F.R. § 250 (2015). The Emergency Food Assistance Program, 7 C.F.R. § 251 (2016).
- Feeding America. (2016). *Hunger in America 2014: National report*. Retrieved from <http://help.feedingamerica.org/HungerInAmerica/hunger-in-america-2014-full-report.pdf>
- Feeding America. (n.d.). *Online marketplace and retail food safety guidelines*. Retrieved from <https://www.fmi.org/docs/default-source/sustainability/online-marketplace-and-retail-food-safety-guidelines-v25.pdf>
- Food Shift. (2015). *Food rescue services, barriers, and recommendations in Santa Clara County*. Retrieved from <https://www.sccgov.org/sites/rwr/rwrc/Documents/FoodShiftFinalReport.pdf>
- Garcia-Silva, B., Handler, E., & Wolfe, J. (2017). A public–private partnership to mitigate food insecurity and food waste in Orange County, California. *American Journal of Public Health*, 107(1), 105–107.
- National Restaurant Association. (n.d.). *Servsafe food handler guide for food banking*. Retrieved from <https://www.servsafe.com/access/ss/catalog/productdetail/eg6rfa10>
- Natural Resources Defense Council. (2017). *Food matters: What food we waste and how we can expand the amount of food we rescue*. Retrieved from <https://www.nrdc.org/sites/default/files/food-matters-ib.pdf>
- Nielsen, R.B., Garasky, S., & Chatterjee, S. (2010). Food insecurity and out-of-pocket medical expenditures: Competing basic needs? *Family & Consumer Sciences Research Journal*, 39(2), 137–151.
- Patton-Lopez, M.M. (2012). *Out-of-pocket health care expenditures and household food insecurity among families with children* (Doctoral dissertation). Corvallis: Oregon State University. Retrieved from https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/qv33s227z
- World Hunger Education Service. (2018). *Hunger in America: United States hunger and poverty facts*. Retrieved from <https://www.worldhunger.org/hunger-in-america-united-states-hunger-poverty-facts-2018/>



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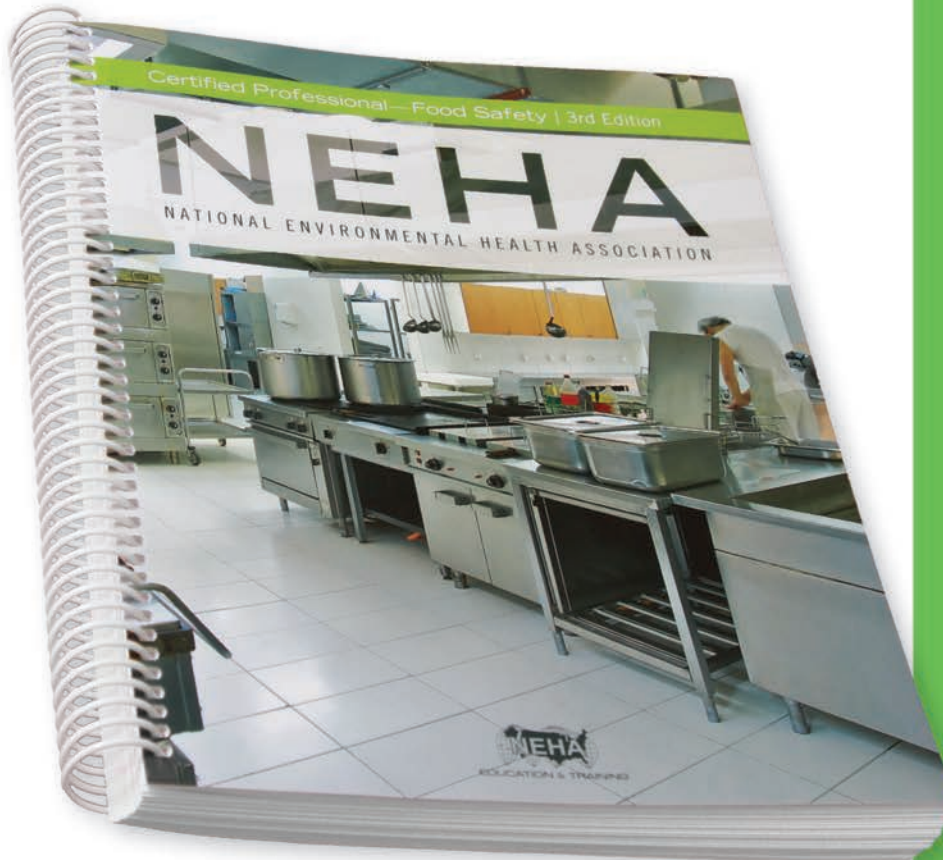
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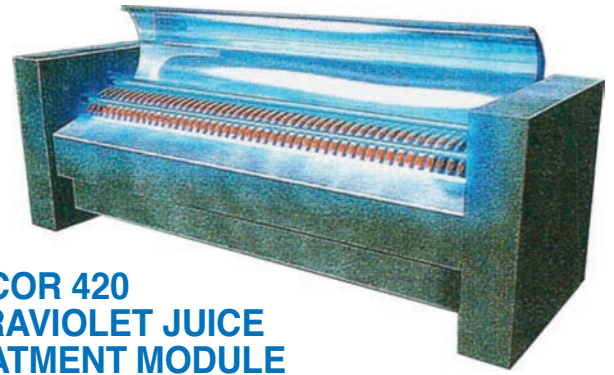
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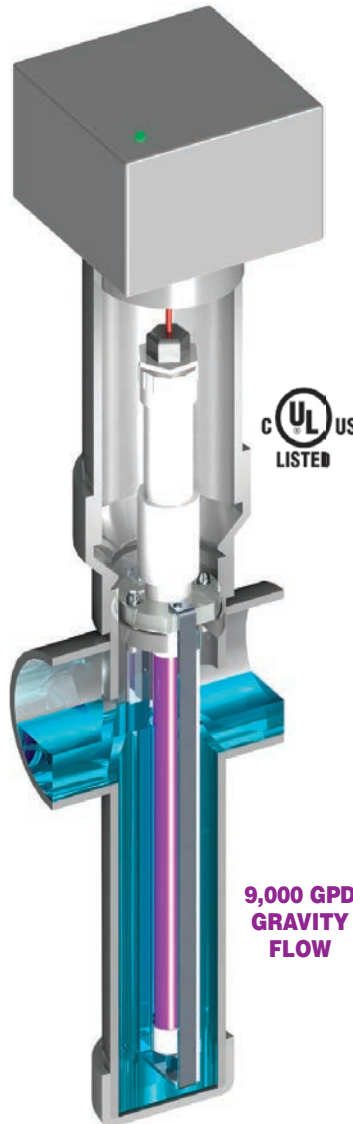


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Uncovering Environmental Health: An Initial Assessment of the Profession's Health Department Workforce and Practice

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Abstract Environmental health (EH) professionals provide critical services and respond to complex and multifaceted public health threats. The role of these professionals is continually re-emphasized by emergencies requiring rapid and effective responses to address environmental issues and ensure protection of the public's health. Given the prominence of the EH profession within the public health framework, assessing the governmental health department workforce, practice, and current and future challenges is crucial to ensure EH professionals are fully equipped and prepared to protect the nation's health. Such an understanding of the EH profession is lacking; therefore, we initiated Understanding the Needs, Challenges, Opportunities, Vision, and Emerging Roles in Environmental Health (UNCOVER EH). Through a web-based survey, we identified EH professional demographics, characteristics, education, practice areas, and aspects of leadership and satisfaction. We distributed the survey to a convenience sample of EH professionals working in health departments, limiting the generalizability of results to the entire EH workforce. The results were strengthened, however, by purposive sampling strategies to represent varied professional and workforce characteristics in the respondent universe. The UNCOVER EH initiative provides a primary source of data to inform EH workforce development initiatives, improve the practice, and establish uniform benchmarks and professional competencies.

Introduction

News stories often cover threats to public health, such as hurricanes and their devastating effects, vectorborne diseases spreading increasingly widely by mosquitoes and ticks, and drinking water contaminated by

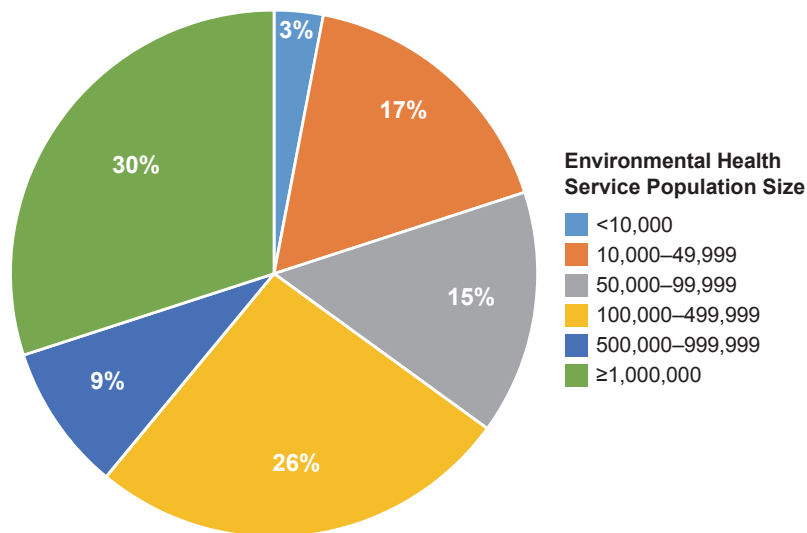
leached chemicals and aging infrastructure. Responses to these threats and approaches to addressing associated detriments to public health are generally complex and multifaceted. In the *Environmental Health Playbook: Investing in a Robust Environmental Health*

System (2017), the National Environmental Health Partnership Council in the U.S. recognized the serious environmental implications resulting from emergency events such as the Zika virus outbreak and the Flint water crisis. Among the needs identified for effective responses to an emergency event, the play-book called for strengthened governmental environmental health (EH) services and an increasingly skilled, well-trained workforce (National Environmental Health Partnership Council, 2017).

EH, as a profession and practice, is one of the most significant contributors to state, tribal, local, and territorial (STLT) public health. As a major segment of the public health workforce, EH professionals have the important responsibility of identifying, investigating, and controlling harmful environmental exposures to prevent related illness and injury (National Environmental Health Association [NEHA], 2013; Resnick, Zablotsky, & Burke, 2009). EH professionals must maintain a high level of competency, skills, and preparedness to fulfill their responsibilities in protecting the public health. The public health landscape is continuously changing and as emerging EH

FIGURE 1

Population Size Served by Environmental Health Professionals in Health Departments in the United States (n = 1,734)



issues and concerns arise, EH professionals and their practice must evolve and adapt to meet the challenge.

The Public Health Workforce: An Agenda for the 21st Century, a report from the U.S. Department of Health and Human Services (1997), listed necessary actions for strengthening the public health workforce. Leadership and workforce development were among these actions. Various studies and assessments of public health departments examined related concepts and shed some light on the EH profession. For example, workforce estimates reported in local health department profiles revealed a decline of more than 2,000 EH full-time equivalents from 2008–2016 (National Association of County and City Health Officials [NACCHO], 2017). Additionally, the total number of different EH activities performed by state health departments reportedly decreased by 5% from 2010–2016 (Association of State and Territorial Health Officials [ASTHO], 2017).

EH professionals were included in the Public Health Workforce Interests and Needs Survey (PH WINS), the first national survey of the state health agency workforce

(Sellers et al., 2015). Additionally, statewide surveys have collected information about EH program capacity and professional characteristics, competencies, and responsibilities (Dyjack, Case, Marlow, Soret, & Montgomery, 2007; Resnick et al., 2009). More than 50 years ago, the U.S. Department of Health, Education, and Welfare (1963) conducted an assessment of sanitarians working in government, the private sector, and academia. What has been missing is a comprehensive effort designed specifically to gather information directly from EH professionals practicing at health departments across the U.S.

Several groups have identified the need for information on EH workforce composition and critical functions (Centers for Disease Control and Prevention [CDC], 2003; NEHA Committee on the Future of Environmental Health, 1993; Resnick et al., 2009). Developing a robust understanding and characterization of the EH workforce is especially needed now to begin to address the challenging and complex problems faced by EH professionals, particularly when reductions in capacity and resources are consistently reported. Given the prominence of the EH profession

within the public health framework, ensuring EH professionals maintain a high level of preparedness and skills is crucial to protect the nation's health.

To meet the need, the Centers for Disease Control and Prevention (CDC), National Environmental Health Association (NEHA), and Baylor University partnered on a groundbreaking initiative: Understanding the Needs, Challenges, Opportunities, Vision, and Emerging Roles in Environmental Health (UNCOVER EH) (Gerding, Landeen, & Brooks, 2017). UNCOVER EH presented a unique and unprecedented opportunity to collect information directly from EH professionals working at STLT health departments. The overall purpose of this effort was to identify and describe key governmental EH workforce and practice elements such as professional demographics, areas of practice, and current and future challenges and opportunities. Information generated through this initiative can inform EH workforce development activities and support enhancement of the practice.

For the present study, we performed a web-based survey aimed at describing EH professional demographics, characteristics, practice areas, and aspects of leadership and satisfaction. The survey was distributed to a convenience sample of EH professionals in health departments, which presents limitations for the generalizability of study results to the entire profession. Here we present an initial attempt to describe and understand the EH workforce in the U.S.

Methods

In November 2017, a link to a web-based survey consisting of multiple choice, scaled, rank ordered, and open-ended questions was e-mailed to 8,996 EH professionals working at STLT health departments. The survey required roughly 30 minutes to complete. It was designed to align with content and elements of different public health workforce and profile surveys, along with recommended workforce study criteria and horizon-scanning methods (ASTHO, 2017; Boulton et al., 2014; Boxall et al., 2012; Furley et al., 2018; NACCHO, 2017; Sellers et al., 2015; Van den Brink et al., 2018).

We followed recommendations to contact potential respondents at five points to maximize the response rate (Dillman, 2007). The

five points included e-mailing 1) an introductory message, 2) an invitation with the survey link, 3) a reminder to complete the survey, 4) a second reminder, and 5) a final message encouraging respondents to complete the survey. The Office of Management and Budget approved the survey and collection of information (Control #0920-1187) in accordance with the Paperwork Reduction Act.

The majority of EH professionals were identified in EH staff directories obtained directly from health departments. Additional sources included online staff directories or lists, state credentialing records for registered sanitarians and registered environmental health specialists, and NEHA state affiliate association membership rosters. Information from all data sources was compiled to generate a comprehensive list of respondent e-mail addresses.

We filtered this list to contain only e-mail addresses for EH professionals employed by STLT health departments. We also tried to ensure this sample included and represented EH professionals from different geographic areas and levels of government. At the end of the survey period, we downloaded results to an Excel spreadsheet and prepared the dataset for analysis. Descriptive statistics were used to examine workforce data, which we categorized as demographics, professional characteristics, education and training, practice, leadership, and satisfaction.

Results

Of the 8,996 EH professionals invited to complete the survey, 56 actively declined participation, 474 partially completed the survey, and 6,730 provided no response. Overall, 1,736 EH professionals fully completed the survey, resulting in a 19% response rate. We included only fully completed surveys in our analysis. The 1,736 respondents represented a relatively balanced representation among states across the nation. By U.S. Census regions, 31% of respondents were from the South, 30% from the Midwest, 27% from the West, and 12% from the Northeast. Respondents from the West included seven EH professionals from Pacific Island territorial health departments. Two state-level health departments from the South declined participation in the survey. These two states have a centralized governance structure and the decision to decline

TABLE 1
Race, Ethnicity, and Professional Characteristics of Environmental Health Professionals in Health Departments in the United States

Characteristic	#	%
Race		
American Indian or Alaska Native	53	3
Asian	73	4
Black or African American	126	7
Native Hawaiian or other Pacific Islander	13	1
White	1,494	86
Ethnicity		
Hispanic	105	6
Position level		
Director/chief	237	14
Supervisor/manager	419	24
Field staff	922	53
Other	157	9
Position title		
Environmental health specialist	813	47
Environmental health technician	17	1
Environmental scientist	50	3
Environmentalist	45	3
Inspector	77	4
Laboratory technician or analyst	6	0.3
Sanitarian	350	20
Other	377	22
Employment status		
Full-time	1,680	97
Part-time	39	2
Seasonal	1	0.1
Temporary	0	0
Prefer not to say	5	0.3
Other	10	0.6

Note. Respondents sometimes selected more than one race; percentages for each category were based on the number of respondents (n = 1,735).

participation resulted in the exclusion of all local-level health departments within those states. We received no responses from territories that had recently been impacted by Hurricanes Irma and Maria.

The majority of EH professional respondents were employed by local health departments (72%, n = 1,242), followed by those

at state (23%, n = 406), territorial (0.5%, n = 8), and tribal (0.4%, n = 7) levels. A small percentage of EH professionals responded from the federal level (2%, n = 27), and likely worked for federal agencies that provide STLT-level services. Figure 1 shows the percentages of population sizes served by respondent health departments. Among re-

FIGURE 2

Age of Environmental Health Professionals in Health Departments in the United States (n = 1,735)

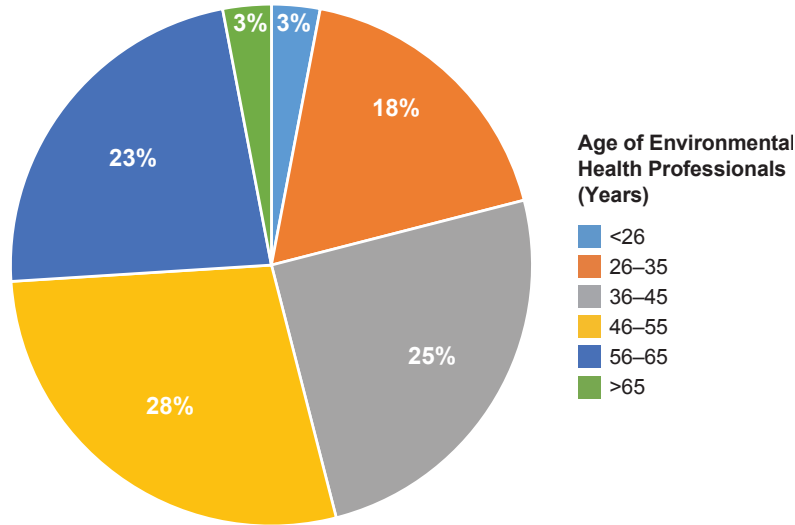
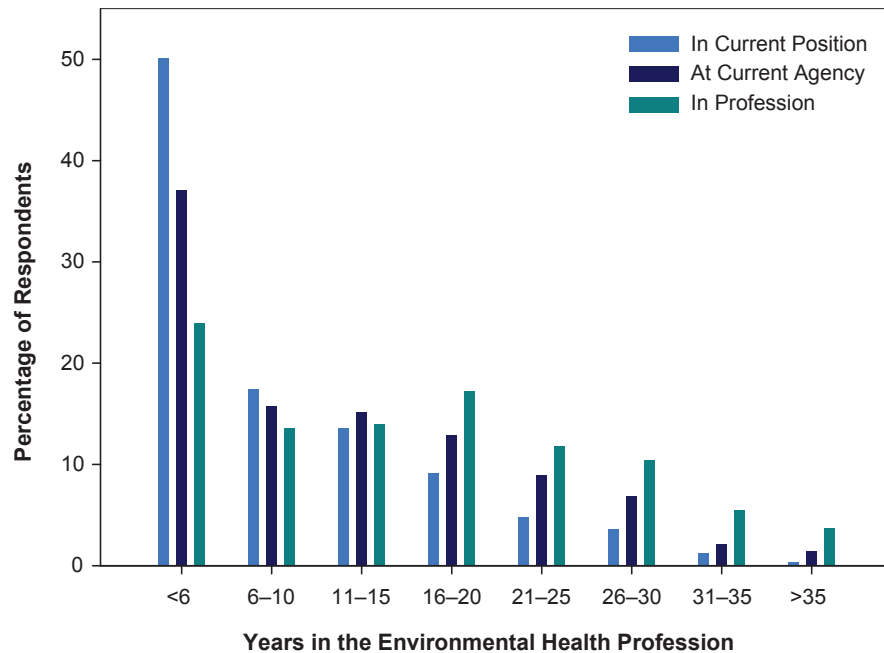


FIGURE 3

Years in Current Position, at Current Agency, and in the Profession for Environmental Health Professionals in Health Departments in the United States (n = 1,734)



spondents, 65% reported that their respective health departments provided services to populations of $\geq 100,000$, with the largest percentage of departments (30%) found in the category of $\geq 1,000,000$.

Demographics

EH professionals of all races responded to the survey (Table 1). The category with the highest proportion of respondents was White (86%, $n = 1,494$), while the lowest was Native Hawaiian or other Pacific Islander (1%, $n = 13$). Approximately 6% ($n = 105$) of the respondents were Hispanic. Relatively even numbers of males (51%) and females (49%) responded. Figure 2 shows the percentages of EH professionals in six age ranges. The highest percentage of EH professionals was 46-55 years of age (28%) and more than half of all respondents were ≥ 46 years (54%).

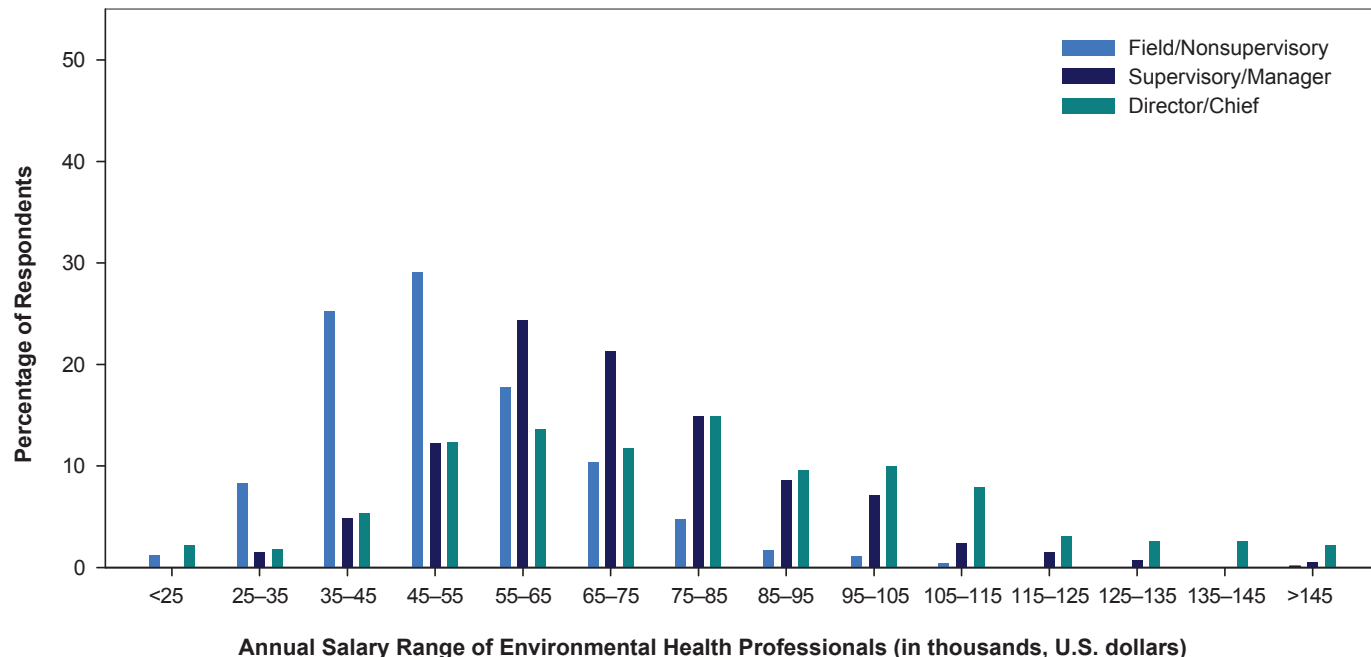
Professional Characteristics

Table 1 shows professional characteristics of the respondents. Most respondents identified themselves as field staff (53%, $n = 922$), followed by supervisors or managers (24%, $n = 419$), and then program directors or chiefs (14%, $n = 237$). The most common job titles were environmental health specialist (47%, $n = 813$) and sanitarian (20%, $n = 350$). Nearly two thirds (64%) of the EH professionals were registered environmental health specialists or registered sanitarians and almost all respondents were full-time employees (97%, $n = 1,680$). Figure 3 shows the number of years respondents had spent in their current position, at their current agency, and in the EH profession. The highest percentages of EH professionals had ≤ 5 years in these three categories. The percentages declined monotonically as age categories increased, except for time in the EH profession, which slightly increased in the 6-20 year range.

Responses pertaining to retirement and career plans revealed that approximately one quarter of EH professionals planned to retire within the next 5 years (26%, $n = 451$). Almost three quarters of respondents, however, had no plans to leave their agency within the next year (71%, $n = 1,231$). Annual salary by position level (field/nonsupervisory, supervisory/manager, and director/chief) showed that most EH professionals in field- and nonsupervisory-level positions had salaries

FIGURE 4

Annual Salaries of Environmental Health Professionals by Position Level in Health Departments in the United States (n = 1,735)



ranging from \$35,000 to \$54,999. Salaries for managers or supervisors mostly ranged from \$55,000 to \$74,999, whereas salaries for directors or chiefs were distributed across the salary ranges, from <\$25,000 to >\$145,000 (Figure 4).

Education and Training

Respondent EH professionals held bachelor’s (72%, n = 1,241), master’s (31%, n = 538), and doctoral (2%, n = 43) degrees in a wide range of fields or concentrations. A few respondents did not complete a college degree (3%, n = 53). The survey allowed selection of two fields of study for each degree type (Table 2). The highest number of EH professionals received bachelor’s degrees in the biological and biomedical sciences (n = 464). Among all the EH professionals with bachelor’s degrees, only 213 indicated their field of study was EH and 76 identified it as public health. Of these 289 professionals, 66 indicated their degree was received from an academic program accredited by the National Environmental Health Science and Protection Accreditation Council (EHAC), 10 from a program accredited

by the Council on Education for Public Health, and 25 reported their degree was from a program accredited by both organizations. Public health (n = 179) and specifically EH (n = 90) were the most common fields of study among those holding master’s degrees. Overall, most EH professionals continued their education by completing training courses within the last year (90%, n = 1,554) and with support from their agencies to travel to attend training (89%, n = 1,538).

Practice

EH professionals had responsibilities in multiple programs (Table 3). The largest percentages of professionals worked in food safety and protection, public swimming pools, and emergency preparedness and response programs. Few EH professionals indicated that they spend 91–100% in one particular program. We also examined time spent in each program area, where the highest number of responses for spending essentially all of their time focused in one program were for food safety and protection (n = 50), public drinking water (n = 10), and onsite wastewater (n = 5).

Approximately 17% of the respondents reported that in addition to EH-related work responsibilities, they also work with other health department programs. Of those EH professionals, 37% spent more than half of their time working in a non-EH program such as health education or immunization programs.

Leadership and Satisfaction

Most EH professionals occasionally or routinely engaged in leadership activities (Table 4). Problem solving and critical thinking was a routine activity for a large percentage of respondents (82%). Participating in community-based events drew the least engagement and most EH professionals strongly or somewhat agreed they have opportunities for professional development and making contributions to their programs (Figure 5). Nearly all respondents reported that leadership training is important for EH professionals (95%, n = 1,649) (data not shown).

Discussion

UNCOVER EH, a comprehensive and tailored assessment designed specifically for

TABLE 2

Degrees and Fields of Study of Environmental Health Professionals in Health Departments in the United States

Field of Study	Bachelor's	Master's	Doctoral
Agriculture and natural resources	89	25	3
Architecture and related services	3	1	0
Area, ethnic, cultural, gender, and group studies	4	0	0
Biological and biomedical sciences	464	51	7
Business	33	26	0
Communication, journalism, and related programs	13	3	0
Communications technologies	2	0	0
Computer and information sciences	5	2	0
Education	52	21	4
Engineering	38	10	0
Engineering technologies	6	5	0
English language and literature/letters	5	0	0
Environmental health	213	90	9
Environmental science	218	66	1
Family and consumer sciences/human sciences	8	1	0
Foreign languages, literature, and linguistics	4	1	0
Health professions and related programs	45	25	4
Homeland security, law enforcement, or firefighting	2	1	0
Legal professions and studies	4	3	4
Liberal arts and sciences, general studies, and humanities	15	0	0
Library science	0	0	0
Mathematics and statistics	12	2	0
Military technologies and applied sciences	5	1	0
Multi/interdisciplinary studies	2	2	0
Parks, recreation, leisure, and fitness studies	6	0	0
Philosophy and religious studies	5	2	1
Physical sciences and science technologies	52	5	0
Precision production	0	0	0
Psychology	29	3	0
Public administration and social services	6	57	1
Public health	76	179	5
Social sciences and history	25	1	1
Theology and religious vocations	1	3	0
Transportation and materials moving	2	0	0
Visual and performing arts	4	0	0
Other	191	77	12
Total	1,241	663	52

Note. The survey allowed selection of two fields of study for each degree type. Of the respondents, 53 did not complete a college degree.

EH, provided a much-needed description of the current STLT health department EH workforce in the U.S. Such information will support future efforts for ensuring EH professionals are well equipped and prepared to meet the complex needs of tomorrow. Results presented in this article fill an important gap in the current understanding of the EH profession and practice.

Survey respondents provided a seemingly broad representation of the EH workforce, with some exceptions, including the limited representation of professionals from tribal and territorial health departments. Considering demographics, a disproportionately high percentage (86%) of EH professionals indicated their race as White. This number is slightly higher than recent observations among the broader state health agency workforce (ASTHO, 2017; Sellers et al., 2015). Those surveys also showed that females represented almost three quarters of the state health agency workforce. In contrast, our survey received responses from an almost even number of male and female respondents. These results might indicate that the EH workforce is slightly less diverse yet has a more balanced male-to-female ratio than the general public workforce, particularly at the state level.

Maintaining a sufficient workforce in light of retirements, and retaining and recruiting staff, is a recognized topic of concern among public health and EH managers (Hilliard & Boulton, 2012; Resnick et al., 2009). Approximately one half of the respondents had worked in their current jobs for ≤ 5 years and approximately one quarter had spent ≤ 5 years in the EH profession. At the mid-career range (16–20 years), respondents consistently had served longer in the EH profession than in their current position and agency. More than one half (54%) of the survey respondents were ≥ 46 years and more than one quarter (26%) were ≥ 56 years. Approximately one quarter (26%) of the EH professionals planned to retire within 5 years, which tends to align with our survey results indicating an aging EH workforce. The public health workforce as a whole, and other specific discipline areas such as public health nurses, face similar percentages of upcoming retirements (Beck & Boulton, 2016; Pourshaban, Basurto-Dávila, & Shih, 2015). Considering these trends, enhancing recruitment efforts and incentives will be essential for preserving

the EH workforce and ensuring a sufficient supply of talented and skilled persons to enter the profession.

A workforce's education and training, work setting, job titles, and functions are important criteria for defining a profession. These criteria are especially relevant for describing and enumerating the public health workforce (Gebbie & Merrill, 2001). Researchers have acknowledged significant challenges in identifying and classifying public health professionals among different settings and governmental levels, which is also realized for the EH workforce (Beck, Boulton, & Coronado, 2014; Mas-soudi, Blake, & Marcum, 2012). Though the objectives of this present study did not include EH workforce enumeration, our results show some consistency in various criteria pertaining to the STLT EH workforce. For example, more than one half of the respondents reported their job titles as environmental health specialist or sanitarian. A similar proportion possessed the registered environmental health specialist or registered sanitarian credential.

We saw less consistency, however, in the respondents' field of study for college degrees. Most EH professionals did not receive formal undergraduate training in EH, which might hamper their ability to effectively deliver essential environmental public health services. Among respondents holding a bachelor's degree, a small proportion identified EH as their field of study. Less than one half of those respondents who studied EH obtained their bachelor's degree from an EHAC-accredited academic program.

EHAC accreditation indicates that an academic program meets stringent requirements, ensuring students receive education in the full range of EH science, with intentions of producing graduates ready to enter the practice (Fletcher, Aighewi, & Murphy, 2016; Marion & Murphy, 2016). As the leading accreditation body for EH academic programs, such observations present a decided opportunity to increase EH degrees granted by EHAC-accredited programs and thus increase capacity of the EH workforce. Regardless, our observations suggest the EH workforce includes professionals who have widely varied educational backgrounds, sometimes nonscience based, and who lack formal academic preparation in the EH sciences and practice. This finding reinforces the current need for workforce development and train-

TABLE 3
Percentage of Environmental Health Professionals Working in Various Programs in Health Departments in the United States (n = 1,735)

Environmental Health Program	%	Environmental Health Program	%
Food safety and protection	76	Healthy homes	20
Public swimming pools	57	Mobile homes	18
Emergency preparedness and response	47	Radon control	17
Schools	46	Animal control	16
Onsite wastewater (e.g., septic systems)	44	Hazardous waste disposal	16
Private or onsite drinking water	43	Land use planning	16
Hotels/motels	39	Pollution prevention	14
Vector control	38	Health-related facilities	13
Body art (tattoo)	36	Outdoor air quality	12
Day care/early child development facilities	34	Hazardous materials response	11
Special events/mass gatherings	31	Tobacco retailers	8
Campgrounds and recreational vehicles	30	Cosmetology businesses	6
Public drinking water systems	28	Noise pollution	6
Lead prevention	25	Collection of unused pharmaceuticals	5
Solid waste	25	Injury prevention	5
Smoke-free ordinances	24	Radiation control	5
Children's camps	22	Occupational health	4
Indoor air quality	22	Toxicology	4
Other recreational water (e.g., beaches)	21	Milk processing	3
		Poison control	2
		Other	28

TABLE 4
Engagement in Leadership Activities of Environmental Health Professionals in Health Departments in the United States (n = 1,734)

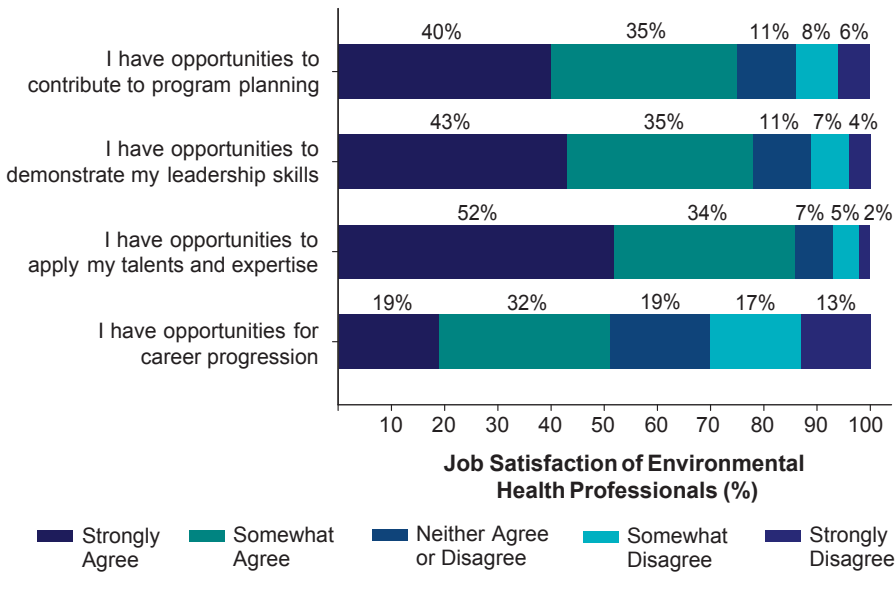
Leadership Activity	Routinely (%)	Sometimes (%)	Never (%)
Collaborating with other governmental agencies and staff	53	41	6
Collecting and analyzing data	44	44	12
Communicating risk to the public	57	37	6
Decision making that influences program planning	47	39	14
Evaluating the effectiveness of services and activities	37	46	16
Participating in community-based initiatives or events	22	61	17
Problem solving and critical thinking	82	16	2

ing opportunities to ensure EH professionals receive essential education in the general EH sciences and practice.

A high number of professionals with master's degrees reported their field of study was EH, which might result from those EH pro-

FIGURE 5

Job Satisfaction Level of Environmental Health Professionals in Health Departments in the United States (N = 1,736)



professionals who lacked undergraduate preparation in the field seeking this specialization in their graduate studies. This finding could highlight the need to increase the availability of EH academic programs and encourage recruitment of their graduates to the STLT workforce. Additionally, attention could be given to ensure that those without an EH degree have access to advanced training in the EH practice. Increasing awareness of the opportunities associated with an EH career and the existence of accredited EH academic programs could be essential for equipping a workforce that has academic credentials specific to the profession.

The EH practice is multifaceted. Most EH professionals appear to fill the role of the generalist in their job function, with responsibilities in a range of programmatic areas. Respondents reported working in traditional EH programs, including food safety, private drinking water, and onsite wastewater, along with newer priority areas such as body art and enforcing smoke-free ordinances. Many EH professionals had responsibilities in areas such as vector control and emergency preparedness/response, which could reflect increased emphasis on response to natural disasters and emerg-

ing vectorborne diseases. Most respondents had opportunities to engage in leadership activities, think critically, and solve problems. Leadership training and guidance are essential for preparing EH professionals to address new and emerging challenges and guide continual transformation of the workforce (CDC, 2003).

Our findings confirm anecdotal evidence that EH professionals play an important role in protecting and promoting community health beyond traditional EH roles and responsibilities. We report here that 17% of respondents worked on public health efforts outside of EH, and of those, 37% spent more than half of their time in a non-EH program. In other words, about 5% of survey respondents reported spending more than half of their time working in non-EH functions. For many rural health departments, the EH professional likely represents the largest and most stable governmental public health workforce constituent. This condition likely arises from the fee-for-service nature of EH programming, which inherently provides staffing stability.

Most respondents (90%) reported they had completed training in the last year and an almost equal percentage received travel

support to attend training, which indicates that EH professionals have access to training opportunities for up-to-date information on current EH topics, along with scientific and technological advances. At the same time, 95% of the respondents felt additional leadership training would be beneficial. EH professionals generally possess strong science educations, are working in programs outside their core responsibilities, and are likely to represent the majority of the workforce in smaller jurisdictions. These factors, in aggregate, make a compelling case to consider a national strategy to embed or dovetail leadership training within traditional training that tends to be more focused on regulatory enforcement.

It is important to note that this study focused on EH professionals practicing at STLT health departments. The EH profession extends beyond this setting to different governmental agencies with varying EH-related responsibilities (Burke, Shalauta, Tran, & Stern, 1997; Sexton & Perlin, 1990). Future assessments would improve our understanding of other EH professionals and the practice in other government agencies and areas such as the private sector. Although the survey respondents provided a relatively broad representation of the EH workforce, the survey results likely are not generalizable to the entire EH workforce.

Respondent selection and response biases can influence the representativeness of the study findings. These biases might result from nonresponse, not identifying EH professionals working in non-EH programs, including EH professionals not currently employed by a health department, and inadvertent inclusion of non-EH professionals in the respondent universe. This study was intended to provide a general description of EH professional and workforce characteristics. Future UNCOVER EH publications will include in-depth statistical analyses of various topics with intentions of determining how different characteristics might, for example, vary among EH professionals' educational background and position level, along with health department size and governmental level.

Conclusion

UNCOVER EH is an essential step forward for assessing and understanding the EH workforce. The next phase of the UNCOVER

ER EH initiative, which includes in-person focus groups and workshops, as well as upcoming publications, will delve deeper into current and emerging EH challenges and opportunities. This initiative will establish a primary source of EH workforce data that could be used to inform workforce development initiatives, support improvement of the practice, establish uniform benchmarks and professional competencies, and effectively allocate funds to support improvement of the practice.

The EH profession and practice is dynamic, plays a critical role in protecting public

health, and must continue to evolve to meet future needs and challenges. To meet calls to enhance the public health workforce, such as those presented by Public Health 3.0 and the National Consortium for Public Health Workforce Development, the EH profession will be required to continually advance its approaches and strategic skills (DeSalvo et al., 2017; National Consortium for Public Health Workforce Development, 2017). Vigilant observation of EH practice trends is essential for maintaining a well-prepared and well-equipped workforce ready to meet tomorrow's challenges. 🐼

Disclaimer: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of CDC.

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References

- Association of State and Territorial Health Officials. (2017). *Profile of state and territorial public health, volume 4*. Arlington, VA: Author. Retrieved from <http://www.astho.org/Profile/Volume-Four/2016-ASTHO-Profile-of-State-and-Territorial-Public-Health/>
- Beck, A.J., & Boulton, M.L. (2016). The public health nurse workforce in U.S. state and local health departments, 2012. *Public Health Reports, 131*(1), 145–152.
- Beck, A.J., Boulton, M.L., & Coronado, F. (2014). Enumeration of the governmental public health workforce. *American Journal of Preventive Medicine, 47*(5 Suppl. 3), S306–S313.
- Boulton, M.L., Beck, A.J., Coronado, F., Merrill, J.A., Friedman, C.P., Stamas, G.D., . . . Leep, C.J. (2014). Public health workforce taxonomy. *American Journal of Preventive Medicine, 47*(5 Suppl. 3), S314–S323.
- Boxall, A.B., Rudd, M.A., Brooks, B.W., Caldwell, D.J., Choi, K., Hickmann, S., . . . Van Der Kraak, G. (2012). Pharmaceuticals and personal care products in the environment: What are the big questions? *Environmental Health Perspectives, 120*(9), 1221–1229.
- Burke, T.A., Shalauta, N.M., Tran, N.L., & Stern, B.S. (1997). The environmental web: A national profile of the state infrastructure for environmental health and protection. *Journal of Public Health Management and Practice, 3*(2), 1–12.
- Centers for Disease Control and Prevention. (2003). *A national strategy to revitalize environmental public health services*. Atlanta, GA: Author. Retrieved from <http://www.cdc.gov/nceh/ehs/docs/nationalstrategy2003.pdf>
- DeSalvo, K.B., Wang, C.Y., Harris, A., Auerbach, J., Koo, D., & O'Carroll, P. (2017). Public health 3.0: A call to action for the public health to meet the challenges of the 21st century. *Preventing Chronic Disease, 14*, 170017.
- Dillman, D.A. (2007). *Mail and Internet surveys: The tailored design method* (2nd ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- Dyjack, D.T., Case, P., Marlow, H.J., Soret, S., & Montgomery, S. (2007). California's county and city environmental health services delivery system. *Journal of Environmental Health, 69*(8), 35–43.
- Fletcher, M.D., Aighewi, I.T., & Murphy, T.J. (2016). The value and benefits of an environmental health bachelor's degree accredited by the National Environmental Health Science and Protection Accreditation Council for community college transfer students. *Pedagogy in Health Promotion, 2*(1), 78–82.
- Furley, T.H., Brodeur, J., Silva de Assis, H.C., Carriquiriborde, P., Chagas, K.R., Corrales, J., . . . Brooks, B.W. (2018). Towards sustainable environmental quality: Identifying priority research questions for Latin America. *Integrated Environmental Assessment and Management, 14*(3), 344–357.
- Gebbie, K.M., & Merrill, J. (2001). Enumeration of the public health workforce: Developing a system. *Journal of Public Health Management and Practice, 7*(4), 8–16.
- Gerding, J.A., Landeen, E., & Brooks, B.W. (2017). Understanding the needs, challenges, opportunities, vision, and emerging roles in environmental health. *Journal of Environmental Health, 80*(1), 36–37.
- Hilliard, T.M., & Boulton, M.L. (2012). Public health workforce research in review: A 25-year retrospective. *American Journal of Preventive Medicine, 42*(5 Suppl. 1), S17–S28.
- Marion, J.W., & Murphy, T.J. (2016). A fork in the road for environmental health workforce development and U.S. public health. *Journal of Environmental Health, 79*(2), 40–43.
- Massoudi, M., Blake, R., & Marcum, L. (2012). Enumerating the environmental public health workforce—Challenges and opportunities. *Journal of Environmental Health, 75*(4), 34–36.
- National Association of County and City Health Officials. (2017). *2016 national profile of local health departments*. Retrieved from http://nacchoprofilestudy.org/wp-content/uploads/2017/10/ProfileReport_Aug2017_final.pdf
- National Consortium for Public Health Workforce Development. (2017). *Building skills for a more strategic health workforce: A call to action*. Retrieved from <https://www.debeaumont.org/building-skills-for-a-more-strategic-health-workforce-a-call-to-action/>

References

- National Environmental Health Association. (2013). New perspectives on environmental health: The approval of new definitions. *Journal of Environmental Health*, 76(3), 72–73. Retrieved from http://www.neha.org/sites/default/files/publications/position-papers/NEHA_Adopted_EH_Definition_July_2013.pdf
- National Environmental Health Association Committee on the Future of Environmental Health. (1993). The future of environmental health: Part 1. *Journal of Environmental Health*, 55(4), 28–32.
- National Environmental Health Partnership Council. (2017). *Environmental health playbook: Investing in a robust environmental health system*. Retrieved from https://apha.org/-/media/files/pdf/topics/environment/eh_playbook.ashx?la=en&hash=FBAE72B837D58A3C3145602B1043250DE7BD41BD
- Pourshaban, D., Basurto-Dávila, R., & Shih, M. (2015). Building and sustaining strong public health agencies: Determinants of workforce turnover. *Journal of Public Health Management and Practice*, 21(Suppl. 6), S80–S90.
- Resnick, B.A., Zablotzky, 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(Suppl. 6), S40–S45.
- Sellers, K., Leider, J.P., Harper, E., Castrucci, B.C., Bharthapudi, K., Liss-Levinson, R., . . . Hunter, E.L. (2015). The public health workforce interests and needs survey: The first national survey of state health agency employees. *Journal of Public Health Management and Practice*, 21(Suppl. 6), S13–S27.
- Sexton, K., & Perlin, S.A. (1990). The federal environmental health workforce in the United States. *American Journal of Public Health*, 80(8), 913–920.
- U.S. Department of Health and Human Services, Public Health Service. (1997). *The public health workforce: An agenda for the 21st century: A report of the Public Health Functions Project*. Washington, DC: Author.
- U.S. Department of Health, Education, and Welfare, Public Health Service. (1963). Sanitarians. In *Health manpower sourcebook*. Washington, DC: Author.
- Van den Brink, P.J., Boxall, A.B.A., Maltby, L., Brooks, B.W., Rudd, M.A., Backhaus, T., . . . van Wensem, J. (2018). Towards sustainable environmental quality: Priority research questions for Europe. *Environmental Toxicology and Chemistry*, 37(9), 2281–2295.



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▶ BUILDING CAPACITY



Darryl Booth, MBA

Building Capacity by Maximizing the Software Demo

Editor's Note: A need exists within environmental health agencies to increase their capacity to perform in an environment of diminishing resources. With limited resources and increasing demands, we need to seek new approaches to the business of environmental health. Acutely aware of these challenges, NEHA has initiated a partnership with Accela called Building Capacity—a joint effort to educate, reinforce, and build upon successes within the profession using technology to improve efficiency and extend the impact of environmental health agencies.

The *Journal* is pleased to publish this column from Accela that will provide readers with insight into the Building Capacity initiative, as well as be a conduit for fostering the capacity building of environmental health agencies across the country. The conclusions of this column are those of the author(s) and do not necessarily represent the views of NEHA.

Darryl Booth is the general manager of environmental health at Accela and has been monitoring regulatory and data tracking needs of agencies across the U.S. for almost 20 years. He serves as technical advisor to NEHA's informatics and technology section.

Like test driving a car along a preapproved route or laying on a mattress under the fluorescent lights of a showroom, we are sometimes expected to make critically important recommendations with just a sliver of information. This experience can also occur in your office when your team joins a meeting in which a potential vendor demonstrates (demos) its software. Eventually you're asked, "What did you think?"

I've attended hundreds of such meetings and for the most part, all participants are keenly interested in matching a health department's needs to the product's capabilities. The demo is a "good one" when the features match

your needs and interest is raised. If the vendor can also spotlight some new sexy technology—the wow factor—even better.

We know intuitively and by experience that the software demo serves to set expectations and convey the promise of some possible future state. Perhaps that's fine but let's do even better!

Before the Demo

Start by preparing the demonstrator. Let it be known what you want to focus and spend the most time on. Declare who will be in the room and their various interests. In your proposed demo outline or script, emphasize

the underlying business need and not the exact process.

It's very useful to share fee schedules, forms, workflow diagrams, and reports in advance. Please don't expect, however, a tailored presentation that shows exactly how the final system will be configured. That level of preparation can take weeks or months.

Applied evenly, such practices normalize competing software solutions.

Finally, confirm what environment you'll provide. An Internet connection and projection system (e.g., screen or large monitors) is normally expected.

A quick note on remote (web-based) demos. If the health department is in its decision-making phase, a face-to-face demo is appropriate. When the health department is just in discovery mode, feel free to suggest a remote demo. There are 2,500 health departments in the U.S. and face-to-face visits are not always practical or responsible options.

If your presenter is traveling to be with you in person, it's appropriate to share recommendations for travel and lodging.

Commit to Prepare

If you're part of a selection committee, you've already studied and scored the vendor's written proposals. Those pages should be open and cross-referenced to the presenter's content. Follow along the script or outline.

Don't trust your memory and plan on taking notes. Notes might include follow-up questions, scores, and deliverables. For follow-up (and to avoid going off schedule), it's a good practice to designate a scribe. The scribe will capture follow-up items and details to be delivered after the meeting.

Visit the proposer's website and LinkedIn pages. Read a few relevant social media and blog posts. Get the flavor of the organization's values.

Demo Day

If you are leading the demo, show your leadership by setting a productive tone before introductions. For example, leaders can start the demo by saying, "A product demonstration can be stress inducing. Let's agree that we're here today to learn through active listening and by asking intelligent questions. Some items will require follow up. That's okay as our scribe will capture those deliverables and share the notes with all in attendance."

Ask your presenter if the demo is live. Is the actual proposed software being used? If so, keep an eye on performance, keeping in mind that a good demo will use a fast computer with all the bells and whistles.

It should be acceptable for the presenter to explain that a certain suggested feature is not available. Overreaching engineering solutions on the fly should be avoided.

Also, it's okay for the health department to learn about alternate ways to conduct their business. Use your scribe to keep things moving along.

In Closing

To the person giving the demo, I respectfully offer this counsel. Go slowly. Your audience has a hundred other responsibilities they've put on hold for your meeting. Give them each time to internalize what you are saying. Be prepared to go off script. It's so very powerful when the person at podium is clearly an expert.

Finally, always remember that we're all here to elevate the profession of environmental health in our shared mission to protect our communities. Have a great demo!



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Software Demo Quick Lists

Proposer Information

- Areas of primary interest (e.g., outline or script)
- Audience, roles, and interests
- Samples of fee schedule, forms, workflow diagrams, reports, and website
- Remote or room configuration (e.g., Internet, projection, whiteboard, etc.)
- Travel/lodging recommendations

Preparation

- Written proposal/materials
- Website review
- Notes on questions, follow up, etc.
- Designate a scribe

Demo Day

- Set a productive tone
- Encourage probing questions/clarifications
- Designate a scribe
- Stay on schedule

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Collaborative Response to Natural Disaster Events Threatening Private Well Water Quality in a New Mexico Community

New Mexico Department of Health

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 this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC’s Water, Food, and Environmental Health Services Branch, as well as guest authors, will share insights and information about environmental health programs, trends, issues, and resources. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

Rose Galbraith has been with the New Mexico Department of Health (NMDOH) Epidemiology and Response Division (ERD) for 4 years with 2 years in the Environmental Health Epidemiology Bureau as the private wells epidemiologist. Nicholas Sharp is a program evaluator in the NMDOH-ERD Environmental Health Epidemiology Bureau. Deyonne Sandoval is the coordinator and evaluator for the New Mexico Environmental Public Health Tracking program and the communications specialist for the Private Wells Program in the NMDOH-ERD Environmental Health Epidemiology Bureau.

An estimated 400,000 New Mexicans rely on drinking water from private wells, particularly in rural areas. Private well water quality is unregulated in the state; therefore, public health plays an essential role in helping to mitigate health risks associated with contaminated private well drinking water through education, outreach, and response.

One essential function of the New Mexico Department of Health (NMDOH) Epidemiology and Response Division’s (ERD) Private

Wells Program, under the Centers for Disease Control and Prevention’s Safe Water for Community Health (Safe WATCH) program, is well owner outreach and linking well owners/users to testing and educational resources. This function is especially important before, during, and after natural disaster events that could impact private well water quality. Providing resources to well users occurs through program and community partnerships. This column will illustrate how the Private Wells Program proactively used both established

and new program partnerships to reduce public health risk during a community’s environmental events.

Disaster Response Case Study

The public health concerns in the village of Ute Park, a mountainous community in northern New Mexico, began May 31, 2018, with the Ute Park Wildfire burning as near as 1 mile from the village (Figure 1). The fire, contained on June 17, 2018, burned over 36,000 acres and left the ground charred and unable to absorb water, creating ideal conditions for flash flooding. By mid-June 2018, flash flooding, an expressed concern of residents, was expected and the large burn scar in the Ute Park area was considered especially vulnerable.

Collaborative Response

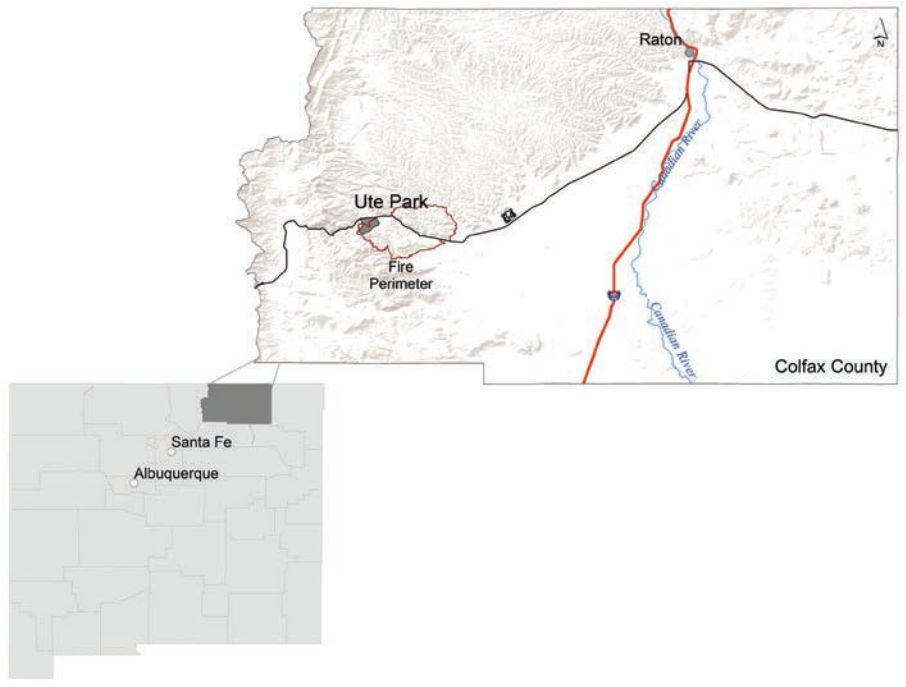
The NMDOH-ERD Environmental Health Epidemiology Bureau’s response, coordinated by the Private Wells Program, included compiling information packets. The information packet content included

- how to protect a well before, during, and after a flood;
- disinfection guidelines;
- well contractor hiring guidelines;
- a certified laboratory list; and
- information on reducing exposure to mold.

As the New Mexico Office of the State Engineer and Ute Park fire chief communicated together, they learned that an estimated 50 full-time Ute Park residents (with an additional 150 vacation/seasonal properties) had a private drinking water well. The Private Wells Program worked with the New Mexico

FIGURE 1

Location of Colfax County and Ute Park, New Mexico

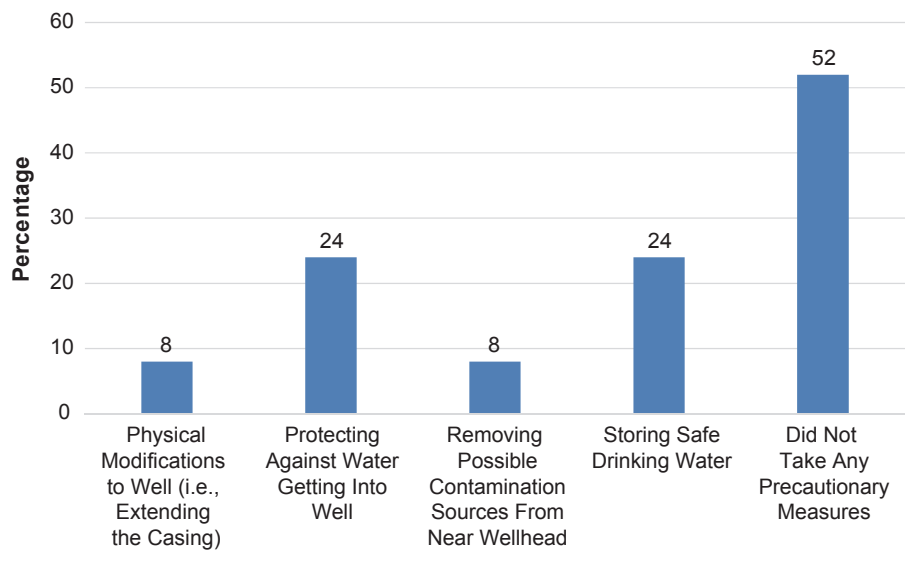


bacteria after a flood is a common public health recommendation. The Private Wells Program and the New Mexico Environment Department, in coordination with the fire chief, worked to provide the community a free well water testing fair for area well users approximately 10 days after flooding occurred. These water testing fairs routinely offer free tests for pH, conductivity, fluoride, iron, sulfate, nitrate, and arsenic. The Private Wells Program, with New Mexico Environment Department partners and technical assistance from the NMDOH-ERD Environmental Health Epidemiology Bureau, also offered free testing for coliforms and *E. coli*. The Private Wells Program, in partnership with the New Mexico Environmental Public Health Tracking program, developed digital and print educational materials specific to waterborne disease and private wells.

This event allowed the agency's private wells epidemiologist to deliver on-site education and supplementary educational material to the 35 residents who attended the event. In cases where the water tests had concerning results, NMDOH followed up with the residents.

FIGURE 2

Precautionary Measures Taken by Well Owners (n = 25)



Evaluation and Next Steps

Anecdotal information from community members suggested well owners, in response to the information packets, were following public health recommendations and some had made physical modifications to their wells prior to flooding. To confirm these impressions and evaluate the overall response effort, the Private Wells Program issued a survey to area property owners. To ensure relevance of the survey, a content validity index was computed based on feedback from four experts.

Survey respondents (n = 25) received the survey via e-mail through the homeowners association in Ute Park. Of these respondents, only 28% (n = 7) received or saw a resource packet from NMDOH. Questions used a 5-point Likert scale to assess the packet's influence on precautionary measures taken with the well. The scale ranged from 1 (strongly disagree) to 5 (strongly agree), with 3 representing a neutral answer.

Of those that received or saw a packet, the average answer was 3.66, an average neutral-agree response that shows a slightly above neutral effect of the well packet on well owners taking precautionary measures. Residents were asked about the precautionary measures

Office of the State Engineer to obtain contact information for known area well owners. Packets were mailed to about 40 owners of permitted drinking water wells.

The local fire chief received a concern about septic overflow during a flood event. Area wells are shallow with a high prevalence of septic systems and testing well water for

used to protect their wells. Approximately half of the respondents took no precautionary measures, with 24% ($n = 6$) of well owners protecting against water getting into the well and storing safe drinking water. Only 8% ($n = 2$) of well owners made physical modifications to the well and removed possible contamination sources from near the well-head (Figure 2).

Of the participants that had their well water tested after flooding ($n = 6$), 67% ($n = 4$) were influenced to test their water because they learned about water quality and well testing from the packet and 83% ($n = 5$) were influenced to test because of the water testing fair offered nearby.

Based on evaluation results, distribution networks need to be improved to reach well owners to maximize the effect of outreach efforts. While the packet did not have a large effect on a well owner's decision to take precautionary measures, the packet and availability of a water testing event did influence well testing behavior in a large percentage of participants.

Challenges

Finding and reaching well owners in a timely manner during disaster responses in New Mexico is a challenge. Finding current well owner and well location information in an easy-to-use format can also be challenging and time consuming. Although the Private

Wells Program is developing a comprehensive database, the effort is ongoing and gaps exist. The need for such a database is highlighted during response events. Such challenges are mitigated through communication with agency and community partners. Utilizing existing program partnerships and cultivating a community relationship before and after flooding occurred were essential to this response effort. 🐛

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Matthew Simonovic, Calhoun County Public Health Department, MI

Meredith Garman, Southern Nevada Health District

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▶ DIRECT FROM NCSL



Doug Farquhar, JD

Enacted 2018 State Environmental Health Legislation

Editor's Note: NEHA's Government Affairs program has a long and productive association with the National Conference of State Legislatures (NCSL). The organizations have worked together on numerous legislative and policy areas that directly impact the environmental health profession. One of the keys to the successes of this collaboration has been the recognition of the fact that often some of the most significant legislation and policy initiatives related to environmental health occur in state legislatures. The states have, in a very real sense, been the innovators in developing new programs and practices. In recognition of this fact, we have asked NCSL to provide occasional overviews of state environmental health legislative activity, covering topics that are of the most pressing public concern

Doug Farquhar, director for NCSL's Environmental Health Program, has worked with NCSL since 1990. Mr. Farquhar directs development, management, and research for the Environmental Health Program.

Introduction

In 2018, state legislatures introduced 3,486 bills related to environmental health and enacted 686 (20%) of the bills. This number of bills is the most on environmental health that the National Conference of State Legislatures (NCSL) has seen since it began tracking the issue back in 2012. Bills on environmental health have almost doubled in the past 7 years. Since 2012, states have introduced 22,727 bills related to environmental health.

The most common environmental health issue state legislatures addressed in 2018 dealt with toxics and chemicals. The 46 legislatures in session in 2018 (Montana, Nevada, North Dakota, and Texas did not hold sessions) introduced 950 pieces of legislation regarding toxics and chemicals and enacted 126 (13%) of the bills. The foremost issue was lead hazards and 19 states passed 40 bills on lead. Not far behind was the issue of food

safety, with states enacting or adopting 188 (21%) of the 898 bills introduced.

Wastewater was the third most popular issue with 707 bills introduced and 148 (21%) enacted. Colorado enacted laws allowing the reuse of graywater. Hawaii enacted several bills regarding cesspools in the state. Maine enacted 5 bills related to wastewater, Maryland enacted 10, North Carolina enacted 4, and Virginia enacted 5.

Drinking water was the fourth most popular issue with 595 bills introduced and 109 (18%) enacted. California enacted 29 bills related to drinking water. Legislation on per- and polyfluoroalkyl substances (PFAS) in drinking water was adopted in Michigan, New Hampshire, New York, North Carolina, Vermont, and Washington.

Due to space limitations, a condensed version of the full report is presented here. Readers can access the full report at www.neha.org/jeh/supplemental or access NCSL's Environmental Health State Bill Tracking Database at www.ncsl.org/research/environment-and-natural-resources/environmental-health-legislation-database.aspx.

neha.org/jeh/supplemental or access NCSL's Environmental Health State Bill Tracking Database at www.ncsl.org/research/environment-and-natural-resources/environmental-health-legislation-database.aspx.

Asthma

In 2018, 65 bills regarding asthma were introduced in 13 states and 12 bills were enacted or adopted in 8 states. Examples include:

- Arizona enacted 2 bills related to asthma. HB 2085 allows for a school employee to administer epinephrine injectors. HB 2323 authorizes a nurse under contract with a school to administer an inhaler to students in respiratory distress and receive civil immunity.
- Illinois enacted 3 asthma bills. SB 1846 requires the Department of Public Health to include asthma in the standard school health examination. SB 3015 amends the school code to authorize a school nurse or trained personnel to provide asthma medication to a student. SB 2889, the Epinephrine Administration Act, allows a health-care practitioner to prescribe epinephrine prefilled syringes and provides for entities to acquire and stock supply of undesignated epinephrine prefilled syringes.
- Nebraska's L 487 provides immunity protections with respect to asthma and allergic reactions.

Body Art

Legislatures introduced 86 bills related to body art, tattooing, or cosmetics and 19 bills were enacted by 11 states. Examples include:

- California SB 1249 bans the sale of any cosmetics that were tested on animals.
- In Idaho, the legislature enacted the Barber and Cosmetology Services Act and Licens-

- ing Board (SB 1324) to require training and licensing for cosmetology professionals.
- The Kentucky legislature clarified that barbers who provide services for hospice or deceased persons must be licensed (H 260).
 - Nebraska's L 731 amends the Cosmetology, Electrology, Esthetics, Nail Technology, and Body Art Practice Act to include mobile cosmetology salons.
 - South Dakota's SB 30 authorizes municipalities to adopt sanitary standards for tattoo and body piercing establishments, including the regulation of the practice of microblading.

Children's Environmental Health

Legislatures adopted 7 bills and enacted 36 bills in 18 states regarding children's environmental health topics. Examples include:

- California enacted 7 bills related to children's environmental health, with 4 bills related to lead poisoning. SB 1041 requires the Department of Health to report on the number of children enrolled in MediCal who have had blood-lead screening tests. SB 1097 requires the department to incorporate lead poisoning data into its Healthy Communities Data and Indicators project. AB 1316 changes the definition of lead poisoning to include concentrations of lead in arterial or cord blood and establishes a standard of care including the risk factors for whether a child is at risk for lead poisoning. AB 2370 requires child day care facilities, upon enrolling or reenrolling any child, to provide the parent with written information on the risks and effects of lead exposure and blood-lead testing recommendations.
- The legislature in Illinois enacted 5 bills and adopted 2 bills on children's environmental health. The legislature is urging the state to monitor and actively participate in federal crumb rubber testing to ensure it is safe for indoor and outdoor recreational facilities (SR 118). HR 790 urges home economics be brought back to high school curriculums, including provisions on the effects of food on well-being and the risk for chronic disease.
- The Louisiana legislature requested the Department of Health to test drinking water at elementary schools and report the results to the legislature (HR 221).
- New Hampshire's SB 247 requires landlords to install lead-reducing filters on faucets if the water exceeds U.S. Environmental Protection Agency (U.S. EPA) standards on lead.
- Oklahoma (SB 950), Ohio (HB 49), and Pennsylvania (HB 1228) enacted laws allowing students and school employees to bring and apply sunscreen to protect students from the sun.
- Rhode Island enacted 2 laws related to children's products and upholstered furniture. SB 166 and HB 5082 prohibit the sale, manufacturing, and distribution of furniture that contains bromide or chlorine bonded to carbon. SB 2179 requires all school buildings where students are in attendance to have carbon monoxide detectors installed and maintained.
- Tennessee SB 619 requires each local board of education to develop a policy to implement a program to reduce the sources of lead contamination in drinking water in public schools.
- The legislature in Washington enacted 3 bills related to children's environmental health. HB 1017 addresses the siting of schools and school facilities. HB 1095 relates to protecting children and animals from poisoning by antifreeze products. SB 5405 allows any person to possess sunscreen products to help prevent sunburn while on school property, at a school-related event or activity, or at summer camp, and encourages schools to educate students about sun-safety guidelines.
- The District of Columbia's DCB 29 requires the installation of filters on sources of water to reduce lead in public schools.
- Illinois adopted HR 94 to encourage testing for *Legionella* in local school water systems.
- In Louisiana, community water systems must maintain records of complaints, require training in compliance and management in certain instances, and provide to the state health officer health data regarding the regulation of community water systems (HB 894).
- The legislature in Maine limited the fee that the Health and Environmental Testing Laboratory may charge for the testing of a residential private drinking water well (H 1327). SB 426 directs the Maine State Housing Authority to distribute state funds to organizations and agencies to identify at-risk individuals in homes with contaminated wells and assist eligible low-income homeowners with the purchase of a water well.
- Michigan's HB 4541 provides for the duties of the Department of Environmental Quality over public water supplies, including water treatment and distribution systems. It also requires that public water supplies be overseen by a certified water treatment operator.
- Minnesota's H 3660 establishes the Water Quality and Sustainability Account that provides for the testing of private wells.
- The legislature in New Hampshire enacted HB 431 that establishes a commission to study the long-term goals and requirements for drinking water sources along the seacoast. SB 453 changes the criteria for drinking water grant programs and requires a municipality receiving water from another municipality's water system to notify its water users about the possible presence of fluoride in the water. HB 1101 directs the Department of Environmental Services to set standards for PFAS in drinking water. HB 1592 requires the department to review the ambient groundwater standard for arsenic.
- New York enacted SB 6655 that directs the Department of Health to post information related to emerging contaminant levels and educational materials, as well as requires information related to U.S. EPA's Drinking Water Information System be available to public water systems and the public. SB 7504 appropriates \$500,000 to the State University of New York at Stony Brook to provide for a new laboratory testing facility.

Drinking Water

Of the 595 bills introduced on drinking water, legislatures in 27 states enacted 97 bills and adopted 8 bills. Examples include:

- Alabama's SB 180 requires a public water system to notify the state before initiating any permanent changes to fluoridation in their water supply.
- Arizona's SB 1042 directs the State Fire Marshal's office to require backflow protections to prevent contamination of drinking water.
- California enacted 29 bills related to drinking water. AB 277 establishes the water and wastewater loan and grant program. AB 355 defines the parameters of a publicly-owned water treatment system for rural areas. AB 574 specifies that direct potable reuse includes raw water augmentation and treated drinking water augmentation.
- Colorado amended its Drinking Water Project Eligibility List (SJR 3). HB 1069 establishes control regulations for reuse of reclaimed domestic wastewater.

ity for perfluorooctanoic acid (PFOA) and other chemicals.

- In North Carolina, PFAS in water is a concern. SB 99 orders any person responsible for the discharge of industrial waste (notably PFAS chemicals) that result in contamination of a private drinking water well to establish permanent replacement water supplies for affected parties.
- Oklahoma limited the licensing requirements of swine feeding operations if the operation does not contribute significantly to the pollution of water (HB 1304).
- Puerto Rico's legislature adopted several studies regarding drinking water. SR 662 will investigate the condition of community water systems and the sources of these systems following the impacts of Hurricanes Irma and Maria. HR 147 studies drinking water consumption in the territory. HR 12 seeks to study the status of drinking water systems in the North Central Region and HR 374 looks at nitrates in drinking water systems.
- The Tennessee legislature requires public water systems with excessive levels of fluoride to notify all customers of the fluoride level (SB 683).
- The legislature in Vermont appropriated \$750,000 to provide for an action plan to clean up PFAS chemicals in Bennington (HB 16).
- Virginia enacted HB 1035 to give priority to the development of water sources to serve as alternatives to the withdrawal of groundwater from the coastal plain aquifer. HB 1608 authorizes the Water Quality Improvement Fund to support cost-effective technologies to reduce phosphorus, nitrogen, or nitrogen containing ammonia to meet the requirements of federal regulations associated with the reduction of ammonia.
- Washington's SB 6901 seeks to ensure that water is available to support residential development and requires an adequate water supply within the water resource inventory area.
- Wisconsin's SB 48 permits for public funds be used for private lead service line replacements. AB 226 provides local assistance to remediate contaminated wells and failing wastewater treatment systems.

Indoor Air Quality

Legislatures adopted 10 bills and enacted 52 bills in 22 states. Examples include:

- The Alaska legislature adopted HCR 29 that prohibits smoking in certain places. This bill was followed by SB 63 that specifies where smoking is prohibited, relates to municipal regulation of smoking in certain places, and allows villages and local governments the option to allow smoking in public places.
- The California legislature enacted the Healthy California Program (AB 74) that requires the Department of Housing and Community Development to establish a Housing for a Healthy California Program. The program's purpose is to create supportive housing opportunities through grants to counties and capital loans to developers.
- The Delaware legislature created a requirement that lodging establishments with an appliance that emits carbon monoxide or an attached garage have working carbon monoxide detection devices in each dwelling or sleeping unit (SB 91).
- Hawaii prohibited smoking and tobacco use, including the use of electronic smoking devices, by any person on the premises of the University of Hawaii (SB 134). SB 2783 increases the distance that smoking is prohibited in and around public housing projects and low-income housing projects and in older adult housing.
- In Louisiana, the legislature created a study committee to evaluate the state's prevalence of tobacco-related illnesses resulting from secondhand smoking (HCR 76). HR 109 requests the Department of Health to study tax- and health-related issues associated with vapor products and electronic cigarettes.
- The legislature in Nebraska enacted the Radon Resistant New Construction Act (L 9) that requires the state to determine minimum standards for state and local building codes regarding radon.
- In New York, the legislature amended the Public Health Law to prohibit smoking at all times in facilities that provide child care services in a private home (AB 397).
- Rhode Island's Public Health and Workplace Safety Act (HB 8357) was amended to include electronic smoking devices, electronic nicotine delivery system products, and other products that rely on vaporization or aerosolization.
- Virginia enacted several laws related to indoor air quality. SB 149 authorizes any locality to designate reasonable no-smok-

ing areas within an outdoor amphitheater or concert venue owned by that locality, requires such ordinance to provide for adequate signage designating such areas, provides that a violation of such ordinance is subject to a civil penalty, and provides that civil penalties shall be expended solely for public health purposes. HB 1534 looks at cancer caused by radon and directs the Department of Health to review consumer complaints related to testing and mitigation received, directs the department to review the current certification requirements for individuals performing radon testing, and directs the department to determine the benefits of any additional oversight for individuals performing testing and mitigation.

Pesticides

Legislatures adopted 6 bills and enacted 29 bills in 16 states on pesticides. Examples include:

- The legislature in Connecticut limited exposure to pesticides by prohibiting the use of residential automatic pesticide misting systems (SB 104).
- Hawaii's SB 3095 establishes disclosure and public notification requirements for outdoor application of pesticides in various sensitive areas or by large-scale outdoor commercial agricultural operations. It also establishes a pilot program that creates a vegetative buffer zone around five selected schools near a commercial agricultural production area.
- In Iowa, HB 2407 forbids a person from intentionally spraying, placing, discharging, or otherwise putting a pesticide off-label into a natural lake, or an artificial lake connected to a natural lake, that is used as a source for public or private water supplies.
- Maryland enacted HB 400 that requires the state, county, or bicounty agency to provide a municipality notification at least 24 hours before the state, county, or bicounty agency sprays a pesticide to control mosquitos within the municipality.
- Michigan enacted a law that allows residents to be notified of pesticide applications adjacent to their property. It also requires the state to maintain a voluntary registry of individuals who, due to a medically documented condition, are required to be notified before the application of a lawn or ornamental pesticide (SB 542).

- Oklahoma's HB 1606 relates to public health and safety, deletes specific herbicide application methods, and requires approval and registration of herbicides used for eradicating plants with the Department of Agriculture, Food, and Forestry.
- Utah's HB 413 modifies provisions of the Pesticide Control Act regarding the requirements for obtaining a business registration certificate for a pesticide applicator business.

Swimming Pools

Legislatures in 5 states enacted 6 bills related to swimming pools, which were mostly technical changes for aquatic professionals. Examples include:

- California enacted 2 bills. SB 442 requires that pools or spas be equipped with drowning prevention safety features when a building permit is issued and requires home inspections to include examinations of pools or spas. AB 1766 requires the State Department of Education, in consultation with the State Department of Public Health, to issue best practice guidelines related to pool safety at K–12 schools.
- Maryland's SB 924 authorizes the governing body of a county to adopt rules and regulations to govern the sanitary condition of splash pads.
- Washington's HB 1449 exempts inflatable equipment operated at a temporary event from regulation of water recreation facilities.

Toxics and Chemicals

Legislatures adopted 16 bills in 8 states and enacted 110 bills in 30 states regarding toxics and chemicals. Examples include:

- California enacted AB 1516 that directs the California Department of Pesticide Regulation and California Environmental Protection Agency to allow the unlicensed use of pesticides if there are no appreciable risks if used properly. AB 2816 requires the department to submit a report that evaluates the implementation of the Healthy Schools Act regarding pesticides and provides recommendations on improving the implementation and efficacy of that act.
- California SB 1263 addresses microplastics. The bill requires the Ocean Protection Council to adopt and implement a statewide microplastics strategy related to microplastic materials that pose an emerging concern for ocean health. The bill

authorizes the council to enter into one or more contracts with marine research institutes for research services that contribute directly to the strategy.

- California's AB 2901 amends the Cleaning Products Right-to-Know Act by updating references to the names of specified substances under the act and adjusting the disclosure on a product label and a manufacturer's website information related to chemicals contained in the designated product.
- The Connecticut legislature enacted legislation providing funding for lead abatement and environmental health and safety concerns (SB 357).
- Delaware amended its law (HB 456) to prohibit the use of lead paints on outdoor structures, such as bridges, water towers, playground equipment, highways, parking lots, and utility towers and poles, in order to protect public health from the dangers of such paints.
- Hawaii banned the sale or distribution of any SPF sunscreen protection personal care product that contains oxybenzone or octinoxate without a prescription issued by a licensed healthcare provider (SB 2571).
- Illinois' SB 2996 updates the state's definition of elevated blood-lead level and requirements for the inspection of regulated facilities occupied by children.
- Louisiana enacted HB 326 to require any local health officer, health unit supervisor, examining physician, hospital, public health nurse, or reporting person to report to the state health officer the existence and circumstances of each case of lead poisoning known to them and not previously reported.
- The Louisiana legislature authorized a pilot program to test drinking water for toxic chemicals in elementary schools (HB 633).
- In Maine, the legislature added language to the appropriations bill to require the Housing Authority to establish and administer a program that provides assistance, including grants, for the abatement of lead paint hazards in residential housing (HB 653).
- The Michigan legislature adopted HR 228 that proposes a framework to guide agencies and ensure the most impactful and relevant decisions in the use of the funds contained in the supplemental budget regarding PFAS-related activities.
- In New Hampshire, if the presence of lead in drinking water exceeds the action level

established by U.S. EPA, the landlord must notify the tenant or prospective tenant and must install on the kitchen faucet a filtering device certified to reduce lead by NSF International/American National Standards Institute (NSF/ANSI) (SB 247).

- New Hampshire enacted S 309 that requires the commissioner of the Department of Environmental Services to adopt a state drinking water standard relative to PFAS, establishes a toxicologist position and a human health risk assessor position in the Department of Environmental Services, and establishes the criteria for setting maximum contaminant limits for public drinking water.
- New York SB 7292 revises provisions related to lead paint remediation from the aboveground transit infrastructure and requires the City Transit Authority to submit a report that identifies all current or planned capital projects involving the removal of existing lead-based paint from any aboveground station, elevated trestle, or elevated subway track. The bill also authorizes the commissioner of health to take enforcement action when areas of lead poisoning are designated.
- North Carolina included language in its Appropriations Bill (S 99) to address PFAS contamination in the state.
- In Pennsylvania, the legislature adopted HR 682 that urges the U.S. Secretary of the Department of Health and Human Services to select the former Naval Air Station Joint Reserve Base Willow Grove; the former Naval Air Warfare Center Warminster; and Horsham, Warrington, and Warminster Townships for an exposure assessment and study on human health implications of PFAS contamination.
- The Tennessee legislature enacted a law (SB 619) that requires each local board of education to develop a policy to implement a program to reduce the potential sources of lead contamination in drinking water in public schools and requires notification to governing authorities and parents if elevated lead levels are detected in drinking water.
- The legislature in Tennessee enacted SB 663 regarding the testing of fluoride in public water systems. SB 683 requires public water systems with confirmed levels of fluoride to perform monthly laboratory

analysis of water samples for fluoride levels and requires these public water systems to notify all customers of the fluoride level.

- Vermont enacted HB 736 that amends the Residential Lead-Based Paint Hazard Reduction Act to include provisions related to the accreditation of lead-poisoning prevention training programs, provides for fees for accrediting training programs, and requires all healthcare providers to test children of specified ages for elevated blood-lead levels.
- Virginia enacted a bill (HB 1241) that prohibits any locality from banning car washing fundraisers that use biodegradable, phosphate free, water-based cleaners.
- Washington addressed PFAS chemicals in food packaging. HB 2658 revises provisions related to the use of PFAS chemicals in food packaging and prohibits the manufacture and sale of food packaging to which PFAS chemicals have been intentionally added in any amount. The legislature also enacted SB 6413 that restricts the manufacturing, selling, and distributing of firefighting foam with PFAS chemicals, requires a recall of firefighting foam products and reimbursement to retailers, and provides that the department must assist local entities in giving priority to the purchase of firefighter personal protective equipment without PFAS chemicals.

Tracking, Surveillance, and Biomonitoring

Legislatures adopted 1 bill and enacted 8 bills in 7 states regarding tracking, surveillance, and biomonitoring. Examples include:

- The Colorado legislature amended its public and environmental health laboratory requirements to allow for certification by a nationally or internationally recognized accreditation organization that includes the scope of forensic toxicology (HB 1302).
- New Hampshire enacted SB 588 regarding inspection of laboratories and requiring laboratory certification under the federal Clinical Laboratory Improvement Amendments.
- The legislature in Utah amended the Environmental Health Science Act (SB 15) to define what constitutes an accredited program and licensure qualifications for an environmental health scientist and environmental health scientist-in-training.

Wastewater

Legislatures adopted 18 bills and enacted 130 bills on wastewater in 31 states. Examples include:

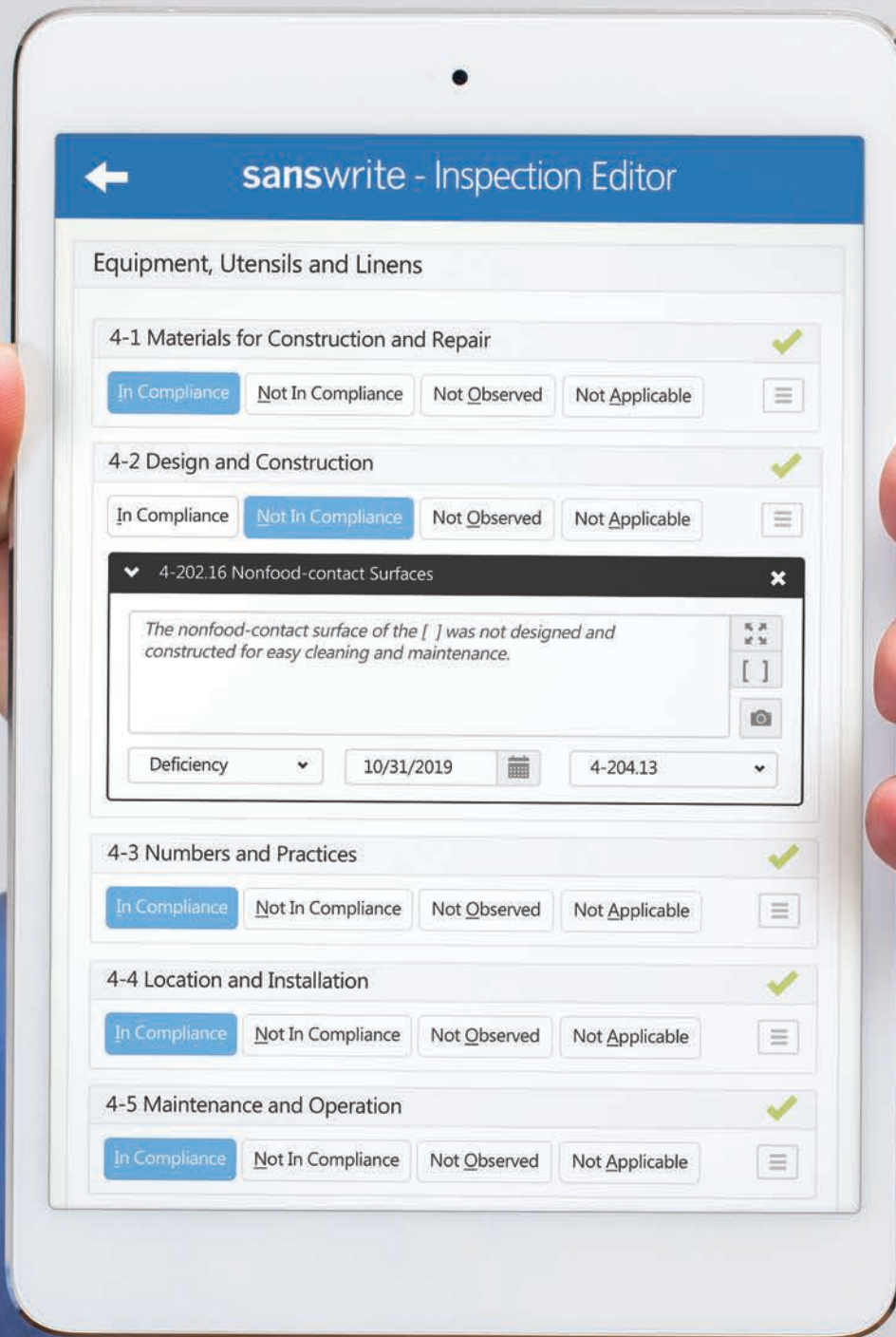
- Alaska's SB 3 and HCR 9 are related to the regulation of wastewater discharge from small commercial passenger vessels.
- Arkansas' SB 8 and HB 1007 focus on the modification and review of permits for liquid animal waste management systems.
- In California, SB 966 requires the Water Resources Control Board to adopt regulations for risk-based water quality standards for onsite treatment and reuse of nonpotable water.
- In Colorado, SB 38 allows reclaimed domestic wastewater to be used for industrial hemp cultivation.
- Connecticut enacted the Sewage Spillage Right-to-Know Act in order to notify the public of unanticipated sewage spills (HB 5130).
- Hawaii enacted 4 bills and adopted 3 regarding private wastewater systems. The legislature prohibited the installation or use of household aerobic units that discharge directly to groundwater unless approved by the director of health (HB 605). HB 1802 directs the Department of Health to certify all qualified cesspools. HB 2043 authorizes counties to inspect and compel property owners to inspect sewer laterals under certain conditions and to make repairs as necessary. SB 2567 establishes a cesspool conversion working group to develop a long-range comprehensive plan for a state-wide conversion of all cesspools.
- Indiana's HB 1233 provides that the term "onsite sewage system" applies to systems that treat sewage from municipalities or publicly-owned treatment works. HB 1267 establishes the Water Infrastructure Task Force to examine standards and practices for the maintenance and management of drinking water systems, wastewater management systems, and stormwater systems, and to prioritize water infrastructure projects.
- The Louisiana legislature amended the state's Sanitary Code to provide limitations on water system testing requirements for certain retail food establishments (HB 846). The state also enacted a law requiring community water systems to establish and maintain records of complaints and sets forth duties of the state health officer

with respect to regulation of community water systems (HB 894).

- Maine's HB 263 increased penalties for the discharge of sewage, septic fluids, garbage, sanitary waste, or other pollutants from watercraft into inland waters.
- In Maryland, SB 496 authorizes the use of graywater for residential purposes and requires the state to adopt regulations regarding graywater use. HB 1765 authorizes reductions in nitrogen from an upgrade to an onsite sewage disposal system to count toward a nitrogen-load reduction required in a watershed implementation plan.
- In Mississippi, the legislature enacted HB 331 that requires advanced treatment systems be in compliance with standards for a Class I system as defined by NSF/ANSI Standard 40: Residential Onsite Systems.
- The New Hampshire legislature appropriated funds (SB 57) to the Department of Environmental Services for the purpose of funding eligible drinking water and wastewater projects under the state aid grant program, as well as made an appropriation from the drinking water and groundwater trust fund to the Department of Environmental Services to address drinking water contamination in Amherst.
- Puerto Rico's SR 662 orders the Senate Committee on Environmental Health and Natural Resources to investigate the condition of community water systems in Puerto Rico and the natural water resources that nourish these systems after the passage of Hurricanes Irma and Maria, as well as their effect on public health.
- Virginia's HB 888 directs the Department of Health to take steps to eliminate evaluation and design services provided by the department for onsite sewage systems and private wells and provides specific requirements and a timeline for such elimination.



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If you are interested in an opportunity near you, please send your resume to Attn: Sethany Dogra at Lst.Ras.Resumes@ul.com or visit our website at www.evercleanservices.com.

In addition to food safety inspectors, we are also looking for GMP auditors for OTC, dietary supplement, and medical device applications. If interested, contact Diane Elliott at Diane.Elliott@ul.com to apply or receive further information. 🐾

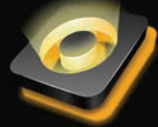
Did You Know?

NEHA has created a NEHA Culture web page where you can learn about its amazing staff and gain insight into what it's like to work at NEHA. You can also view and apply for open positions at NEHA. Check it out at www.neha.org/about-neha/neha-culture.

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EH CALENDAR

UPCOMING NEHA CONFERENCES

July 9–12, 2019: NEHA 2019 Annual Educational Conference & Exhibition, Nashville, TN. For more information, visit www.neha.org/aec.

July 13–16, 2020: NEHA 2020 Annual Educational Conference & Exhibition, New York, NY.

July 12–15, 2021: NEHA 2021 Annual Educational Conference & Exhibition, Spokane, WA.

NEHA AFFILIATE AND REGIONAL LISTINGS

Alabama

October 16–18, 2019: Annual Conference, hosted by the Alabama Environmental Health Association, Lake Eufaula, AL. For more information, visit www.aeha-online.com.

Colorado

September 17–20, 2019: Annual Education Conference, hosted by the Colorado Environmental Health Association, Keystone, CO. For more information, visit www.cehawe.com.

Florida

July 30–August 2, 2019: Annual Education Meeting, hosted by the Florida Environmental Health Association, Howey in the Hills, FL. For more information, visit www.feha.org/events.

Georgia

June 12–14, 2019: Annual Education Conference, hosted by the Georgia Environmental Health Association, Stone Mountain, GA. For more information, visit www.geha-online.org.

Illinois

September 16–17, 2019: South Chapter Annual Educational Conference, hosted by the South Chapter of the Illinois Environmental Health Association, Marion, IL. For more information, visit www.iehaonline.org.

November 4–5, 2019: Annual Educational Conference, hosted by the Illinois Environmental Health Association, Utica, IL. For more information, visit www.iehaonline.org.

Kentucky

July 24–26, 2019: 2019 Interstate Environmental Health Seminar, hosted by Eastern Kentucky University Department of Environmental Health Science, Richmond, KY. For more information, visit www.ehsky.org.

Montana

September 17–18, 2019: 2019 MPHA/MEHA Conference, hosted by the Montana Public Health and Environmental Health Associations, Bozeman, MT. For more information, visit www.mehawe.org.

Nebraska

September 25–26, 2019: NEHA Region 4 Fall Conference, hosted by the Nebraska Environmental Health Association, Omaha, NE. For more information, visit www.nebraskaneha.com/region4conference.html.

Texas

October 14–18, 2019: 64th Annual Educational Conference, hosted by the Texas Environmental Health Association, Austin, TX. For more information, visit www.myteha.org.

Wisconsin

October 16–18, 2019: Annual Educational Conference, hosted by the Wisconsin Environmental Health Association, Elkhart Lake, WI. For more information, visit www.weha.net.

TOPICAL LISTING

Recreational Water

October 16–18, 2019: 16th Annual World Aquatic Health Conference, hosted by the National Swimming Pool Foundation, Williamsburg, VA. For more information, visit www.nspf.org/wahc.

Water Quality

September 11–13, 2019: Legionella Conference 2019, presented by NSF International and the National Environmental Health Association, Los Angeles, CA. For more information, visit www.legionellaconference.org.

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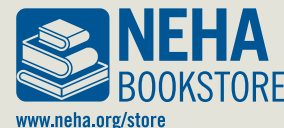
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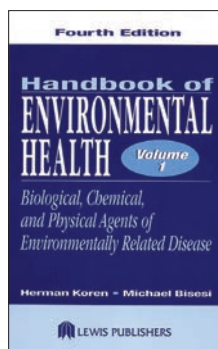
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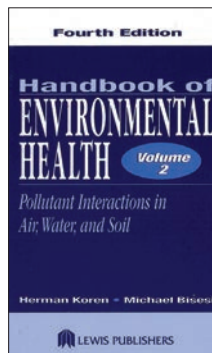
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SCHEDULE AT A GLANCE

Sunday, July 7–Tuesday, July 9

- Preconference Review Courses, Workshops, and Training

Tuesday, July 9

The Conference Begins: Day 1

- Keynote Address
- Exhibition Grand Opening
- Credential Exams

Wednesday, July 10

- REHS/RS Credential Exam

Conference: Day 2

- Grand Session Kickoff
- Concurrent Educational Sessions
- Exhibition
- General Jackson Showboat Event

Thursday, July 11

Conference: Day 3

- Breakfast & Town Hall Assembly (Sponsored by the National Restaurant Association)
- Concurrent Educational Sessions
- Awards Ceremony
- Grand Ole Opry House UL Event

Friday, July 12

Conference: Day 4

- Concurrent Educational Sessions
- Closing Session

Schedule and times are subject to change. View full schedule, workshops, and times at neha.org/aec/schedule.

Review Courses and Trainings	Date
Registered Environmental Health Specialist/Registered Sanitarian (REHS/RS) Credential Review Course	July 7–9
Certified in Comprehensive Food Safety (CCFS) Credential Review Course	July 7–8
Certified Professional-Food Safety (CP-FS) Credential Review Course	July 7–8
Food Safety Auditor (FSA) Training	July 7–8
Instructional Skills Training (IST)	July 7–8
Credential Exams*	
CCFS, CP-FS, CFSSA, CFOI	July 8
REHS/RS	July 9
Workshops	
FDA National Retail Food Regulatory Program Standards Self-Assessment and Verification Audit Workshop	July 7–9
Survival Skills for Environmental Health Leaders	July 8
Affiliate Leadership Workshop	July 8
NEHA and Climate for Health Ambassador Training	July 9

*Only qualified applicants are able to sit for an exam.

A separate application is required for each exam. Application deadline was May 28, 2019.

NEHA NEWS

NEHA 2019 General Election Results

By Angelica Ledezma (aledezma@neha.org)

Elections are a critical part of the democratic process and are one way to provide members a voice in the running of their organization. NEHA voting members have an opportunity to vote for candidates of contested board of director and regional vice-president (RVP) positions, as well as cast votes regarding proposed Articles of Incorporation and Bylaws changes. National officers of NEHA's board of directors serve a 1-year term in each officer position (second vice-president, first vice-president, president-elect, president, and immediate past-president) for a total of 5 years. Regional vice-presidents serve 3-year terms.

Eligible voters were encouraged to vote during the month of March. The deadline to vote was April 1, 2019. The following are results from the 2019 general election.

Second Vice-President

There were two qualified candidates for the second vice-president position: D. Gary Brown, DrPH, CIH, RS, DAAS and Shelly Wallingford, MS, REHS. All eligible NEHA members were asked to vote for the position of second vice-president and Brown received the majority of votes. Both candidate profiles were published in the March 2019 *Journal of Environmental Health* and on NEHA's website. Brown will assume the second vice-president position at the close of the NEHA 2019 Annual Educational Conference (AEC) & Exhibition in Nashville, Tennessee, in July 2019.

Regional Vice-Presidents

NEHA's membership is broken down into nine regions that represent U.S. geographic areas, as well as members in the U.S. military and abroad. The terms of three RVP positions expire in 2019—

Region 4: Kim Carlton; Region 6: Lynne Madison; and Region 9: Larry Ramdin.

Regions 4 and 9 had one eligible candidate and did not appear on the election ballot. Each of these candidates will automatically assume their RVP roles at the 2019 AEC in July. There were three candidates for Region 6: Nichole (Niki) D. Lemin, MS, RS/REHS, MEP; Jason W. Marion, MSB, MSPH, PhD; and Jason Ravenscroft, MPH, REHS. NEHA members residing in Region 6 were able to vote for the candidates via the election ballot and Lemin received the majority of votes.

The unopposed and elected individuals will assume their positions at the close of the 2019 AEC and their terms will expire in 2022. All candidate profiles were published in the March 2019 *Journal of Environmental Health* and on NEHA's website. The new (and returning) RVPs are as follows:

- Region 4: Kim Carlton, MPH, REHS, CFOI, Minnesota (Region 4 includes Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin);
- Region 6: Niki Lemin, MS, RS/REHS, MEP, Ohio (Region 6 includes Illinois, Indiana, Kentucky, Michigan, and Ohio); and
- Region 9: Larry Ramdin, REHS, CP-FS, HHS, Massachusetts (Region 9 includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont).

A listing of current NEHA national officers and RVPs, along with state breakdowns for each region, can be found on page 55. More information about NEHA's governance, including its Articles of Incorporation and Bylaws, the election process, and associated deadlines, can be found at www.neha.org/about-neha/governance.

Thank you to all members who participated in this year's election! 🙏



Employers increasingly require a professional credential to verify that you are qualified and trained to perform your job duties. Credentials improve the visibility and credibility of our profession and they can result in raises or promotions for the holder. For 80 years, NEHA has fostered dedication, competency, and capability through professional credentialing. We provide a path to those who want to challenge themselves and keep learning every day. Earning a credential is a personal commitment to excellence and achievement.

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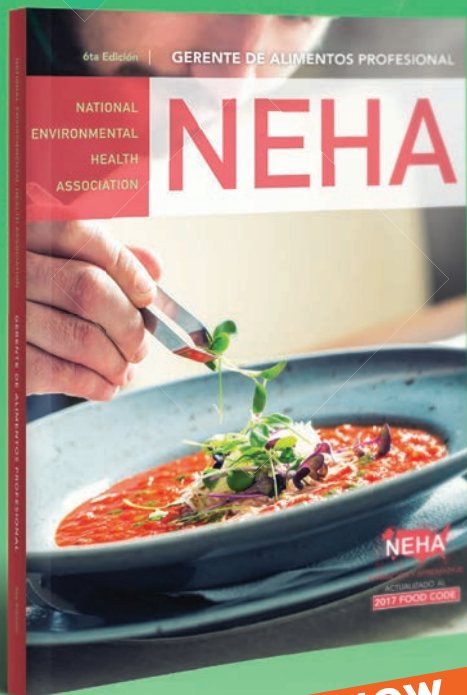


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DiracTalk*continued from page 62*

The Nashville cityscape at dusk. Known as Music City, Nashville offers a wide variety of inspiring things to do—from music, culture, and the arts to food, sports, and shopping. Photo courtesy of the Nashville Convention and Visitors Corporation.

Center for Environmental Health, will be presenting multiple sessions within the Food Safety and Water tracks. Dr. Patrick Breysse, director of the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry will moderate a panel session titled “How State Level Policy Can Address Emerging Environmental Health Issues.”

Attendees will not only gain valuable knowledge from attending the sessions, they will be able to earn continuing education credits toward their NEHA credentials. The preconference offerings, July 7–9, include NEHA credential review courses; food safety auditor, instructional skills, and Climate for Health ambassador trainings; credential exams; and workshops covering affiliate leadership, food safety, and leadership survival skills. For a complete listing of preconference offerings, visit www.neha.org/aec/preconference.

To support the lifecycle of the environmental health professional, we are offering multiple registration options. Environmental health students and young professionals can take advantage of a discounted registration rate and a 1-year NEHA membership with

registration. The Poster Session is also a great place for students and young professionals to display their research, interests, and areas of study. For additional information, visit www.neha.org/students. Retirees can also benefit from a discounted registration rate and single-day registration options are available. To register for the conference and learn more, visit www.neha.org/aec/register.

After all that learning, we have planned a couple of spectacular evening social events to allow you to unwind, network, and catch up with your peers. On Wednesday, July 10 (included with your full conference registration), we will cruise down the Cumberland River on the General Jackson Showboat where the evening will be filled with local Nashville flavors, music, and dancing.

Sponsored by Underwriters Laboratories on Thursday, July 11, is the don't want to miss Grand Ole Opry House UL Event. This evening will feature a dinner reception on the stage of the Grand Ole Opry where so many of your favorite singers have performed, as well as an exclusive backstage tour. Tickets have been selling fast and space is limited. While still available, tickets can be purchased for \$75 at www.neha.org/aec/events.



While on a site visit of Nashville, National Environmental Health Association staff and conference planners take the stage at the Grand Ole Opry, which was selected as the location of the UL Event. Photo courtesy of David Dyjack.

I would be remiss if I forgot to mention the Exhibition Grand Opening following the Keynote Address on Tuesday, July 9. Attendees can enjoy a beverage and reception fair while strolling through the aisles and socializing with companies and organizations showcasing products and services that support them and their careers.

We at NEHA are proud to serve you in our 83rd year of offering continuing education for the environmental health profession through our annual conferences. We are also proud to offer fun social activities that grant you the opportunity to network, share your expertise, and connect with old friends while making new ones who share your desire and passion in ensuring and building a healthy and safe environment for all.

Visit www.neha.org/aec for all the details about this amazing conference. We look forward to seeing you in Nashville and thank you for your support. 🚗

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► **DirecTalk** MUSINGS FROM THE 10TH FLOOR

David Dyjack, DrPH, CIH

Planning, creating, and delivering the educational content for the National Environmental Health Association (NEHA) Annual Educational Conference (AEC) & Exhibition is a team effort led in large measure by our Chief Learning Officer Kristie Denbrock. She is the personification of a modern-day alchemist, transforming seemingly mundane content into educational gold. This effort is not trivial as the shearing forces associated with schedules, room sizes, and increasingly expensive technology and social programs make this enterprise daunting. Given this background, it brings me great pleasure to give Kristie an opportunity to provide an overview of the fruits of her labor—the NEHA 2019 AEC. The charming location, scientific relevance, and presence of influencers with regional, national, and international perspectives catalyze to create an amalgam that promises to deliver an exceptional experience.

ddyjack@neha.org
Twitter: @DTDyjack

Local Voices, Universal Language Kristie Denbrock, MPA

Whether you serve your constituents locally, statewide, nationally, or internationally, the NEHA 2019 AEC taking place July 9–12 in Nashville, Tennessee, has offerings that are tailored to you and your profession by speaking with *Local Voices* that make up a *Universal Language*.

Tuned Into Nashville

The NEHA 2019 AEC has offerings that are tailored to you and your profession by speaking with Local Voices that make up a Universal Language.

Local Voices, Universal Language is the theme for this year's conference being held at the amazing Gaylord Opryland Resort & Conference Center. After the success of the 2018 AEC in Anaheim, California, it became apparent that issues taking priority on a local level are in the same arena on a global scale. Natural disaster relief is a prime example and will be featured in a discussion of distinguished panelists moderated by Dr. Dyjack.

We are pleased to announce our three featured speakers:

- Robert Kadlec, MS, MTM&H, MD, Assistant Secretary for Preparedness and Response at the U.S. Department of Health and Human

Services, will present the Keynote Address, “Creating a Voice to Protect the Nation From 21st Century Health Security Threats.”

- Anne Godfrey, CCMI FCIM, chief executive of the Chartered Institute of Environmental Health, will deliver the Grand Session Kickoff, “A Profession United? The Evolution of Environmental Health,” with an international perspective.
- Grayson C. Brown, PhD, executive director of Puerto Rico Vector Control will provide the Closing Session, “New Threats, New Techniques, New Strategies: The Changing Face of Vector Management.”

More information on our featured speakers can be found at www.neha.org/aec/speakers.

These three plenary sessions help set the tone of bringing local and international issues into focus. With approximately 200 educational offerings, attendees will have a multitude of environmental health topics and issues to choose from, including emerging issues such as

- Fentanyl Contamination, Exposure, Detection, Risk, and Decontamination;
- Cannabis and Food Safety: The Latest News and Emerging Issues;
- NEHA LeadHERship sessions;
- Per- and Polyfluoroalkyl Substances (PFAS)—Opportunities and Challenges; and
- Food Freedom vs. Food Safety: AB 626, California's Newest Law.

To view the full 2019 AEC agenda, visit www.neha.org/aec/sessions.

Conference cosponsors, the Centers for Disease Control and Prevention's National

continued on page 60



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