

▶ SPECIAL REPORT



Critical Competencies in Children's Environmental Health

Abstract Competency in children's environmental health allows for the development of interventions that can prevent the long-term and irreversible health outcomes that result from early environmental toxic exposures. Health effects that are thought to be at least partially influenced by early exposures include cardiovascular disease, diabetes, cancer, autism, attention-deficit/hyperactivity disorder (ADHD), lower IQ, Parkinson's disease, and Alzheimer's disease. Despite the value of children's environmental health, there are still gaps in workforce training for those interested in children's environmental health. These gaps in knowledge and training highlight the need for improved ways to build the capacity of children's environmental health professionals. Our work focused on creating a set of competencies for public health professionals interested in children's environmental health careers as a way to meet the demand for children's environmental health specialists. We identified 12 competencies that individuals can adopt to build their capacity as children's environmental health professionals.

Introduction

Although many children's health problems are associated with environmental exposures (American Academy of Pediatrics Council on Environmental Health, 2019; Landrigan, 2016), many public health professionals do not have the expertise to recognize and prevent these health problems (Landrigan & Etzel, 2014). Students who train in maternal and child health learn about the health problems of children but not much about the environmental determinants associated with these problems (Kirby & Verbiest, 2022). Meanwhile, students who are studying environmental health learn about water, sanitation, and air pollution but often not enough about the special vulnerability of children. This article aims to define critical competencies in children's

environmental health for students and professionals working in public health.

Methods for the Development of Children's Environmental Health Competencies

A competency is an observable ability integrating multiple components such as knowledge, skills, values, and attitudes (Frank et al., 2010). Competencies are needed to successfully perform a role or responsibility as a public health professional and serve as metrics for training and evaluating development and performance. The training to meet competencies can derive from experiences in structural learning environments inside or outside of the workplace. For public health students and

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professionals, competencies in children's environmental health serve to:

1. Provide students and public health professionals interested in careers in children's environmental health with a listing of what they should be able to do when they complete their training.
2. Help potential employers know what they can expect of a person who is trained in children's environmental health.
3. Guide faculty and degree programs that choose to prepare students for careers in children's environmental health with opportunities that incorporate structured learning experiences.

The children's environmental health competencies were developed by the Children's Environmental Health Curriculum work group, which is composed of members from the Children's Environmental Health Committee of the Environment Section within the American Public Health Association. The professionals on this committee are health scientists, faculty members in schools of public health, pediatricians, and health advocates, each of whom have 7 to >25 years of experience in children's environmental health. We chose to incorporate the experience of

TABLE 1

Critical Competencies in Children's Environmental Health

Competency #	Competency
1	Assess a children's environmental health concern, risk, or potential exposure in a community and develop a briefing paper.
2	Present information to stakeholders about children's environmental health threats and prevention methods.
3	Develop, implement, and evaluate a community-based intervention to mitigate a children's environmental health threat.
4	Increase children's exposure to healthy natural environments.
5	Monitor and report child health indicators to the state or local public health department.
6	Communicate to the media promoting children's environmental health through traditional and nontraditional outlets (e.g., social media).
7	Identify how climate change and environmental exposures (e.g., pesticides) affect children's health (short and long term).
8	Be able to recognize or assess structural and systemic harms (e.g., built environment, climate change, risks associated with exposure) on children's health.
9	Identify federal, state, and local regulations as they relate to children's health and the environment.
10	Prepare and present testimony about children's health and the environment before local and state legislators.
11	Identify actions and evaluate yearly progress toward the reduction of greenhouse gas emissions and the carbon footprint of an organization (i.e., state or local health department).
12	Design environmental health guidelines that account for children's unique vulnerabilities and long-term susceptibility to health effects.

professionals in children's environmental health because their abilities have been gained through formal and informal training and experiences in the field. By aligning the competencies of children's environmental health with public health competencies and incorporating field experience, we captured essential abilities needed to work in the field.

The process for developing the competencies involved discussions and evaluations from a wide range of children's environmental health professionals. We carried out discussions via email and monthly virtual meetings between May and October 2021. The first set of 10 competencies was developed by the Children's Environmental Health Curriculum work group in July 2021. Next, this set was evaluated using a ranking system (i.e., 1 being the least relevant, 5 being the most relevant) by 13 members of the Children's Environmental Health Committee to determine which competencies were essential for public health graduates and professionals to work in children's environmental health fields. Through this

evaluation process, we learned which competencies were less important and which were missing. The final set was developed in October 2021 and included the 12 competencies presented in Table 1.

Discussion

The 12 competencies identified by a consensus process provide a foundation to advance the training of people who are capable of recognizing and preventing diseases and conditions from environmental exposures in childhood. This work builds on—rather than replicates—the Core Competencies for Public Health Professionals from the Public Health Foundation (2021). The Public Health Foundation core competencies reflect foundational abilities for professionals engaging in the practice, education, service, and research of public health, environmental health, and children's environmental health.

The domains and abilities are data analytics and assessment skills, policy development and program planning skills, communication skills, health equity skills, community partner-

ship skills, public health sciences skills, management and finance skills, and leadership and systems thinking skills (Public Health Foundation, 2021). The Public Health Foundation core competencies also incorporate environmental and social justice elements to advance health equity. The children's environmental health competencies were created to enhance public health training and highlight environmental health equity strategies.

Our work provides a set of competencies that individuals can adopt to build their capacity as children's environmental health professionals. Our work also builds on but does not intend to replace children's environmental health competencies for pediatricians and other health professionals who are involved in the clinical care of patients. For example, the Academic Pediatric Association has developed 27 pediatric environmental health competencies with performance indicators regarding academic knowledge, individual patient care, and community advocacy for pediatric specialists (Etzel et al., 2003).

For other healthcare providers, Goldman et al. (2021) identified 15 environmental health competencies to enable providers to effectively address environmental health concerns in pediatrics; the authors summarize resources such as continuing education credits, webinars, interactive modules, and reading materials to build capacity in children's environmental health or pediatric environmental health for clinicians. Buka et al. (2020) have suggested that professional organizations at local, national, and international levels develop global competencies for physicians in children's environmental health to raise awareness of fundamental concepts. We recommend that clinicians who work as public health specialists use children's environmental health competencies to enhance training in children's environmental health throughout their career, including during preclinical, residency, and postgraduate training.

Children's environmental health competencies bring value to formal training programs that do not include children's environmental health capacity and offer value for those who train children's environmental health professionals. We envision that the children's environmental health competencies could be used to:

A. Guide students interested in children's environmental health careers as they complete their public health training.

Currently, the list of accredited programs and schools from the Council on Education for Public Health includes no accredited public health program or school in the U.S. that offers specialized training in children's environmental health. The children's environmental health competencies meet this gap in training by providing public health students with a list of abilities needed to be competent in this field. Interested students could use these competencies to seek formal and informal experiences as well as supplementary training within and outside their public health program to complete their training in children's environmental health. While this approach relies on students to be self-motivated to seek this training, these competencies serve as an accessible tool and short-term solution to building the children's environmental health workforce through formal training programs. Organizational-level change to incorporate children's environmental health is beyond the scope of this article.

B. Guide public health professionals who want to integrate children's environmental health into their practice.

There is interest within the maternal and child health and the environmental health professional communities of the American Public Health Association to integrate children's environmental health into their practice. This interest is a result of recognizing the need to consider children's vulnerabilities and environmental factors in policies, research, and interventions to protect and improve the well-being of children. Therefore, these environmental health competencies could help public health professionals in related fields who are interested in transitioning or increasing their capacity in this field. Similar to students in public health programs, public health professionals can use these competencies to guide their experiences and

meet additional training needs in children's environmental health.

C. Assist potential employers regarding what to expect of a person who is trained in children's environmental health.

To build the children's environmental health workforce, there needs to be a clear workforce demand. We encourage employers to incorporate these competencies as they write job descriptions so that job descriptions are clear on the expectations for candidates. We also encourage employers who are interested in continuing to build the capacity of their employees to integrate these competencies into in-house training opportunities. In-house training opportunities could help current and prospective employees achieve children's environmental health abilities and create non-formal training experiences for employees.

D. Provide faculty who wish to prepare students for careers in children's environmental health with competencies to help them structure suitable learning experiences.

Sometimes faculty and degree programs have the opportunity to incorporate children's environmental health capacity-building experiences into their lesson or degree plans and can do so with minimal effort and resources. For example, faculty could add extra steps to their assignments to help students practice presenting children's environmental health-related information to different audiences, or in many forms, including traditional and nontraditional forms of media and briefing papers. Faculty could also ask students to focus on children's environmental health topics when doing data analysis and literature reviews or evaluating the impacts on children's health and the environment from proposed projects, plans, or policies. For experiences outside the classroom, these competencies can be used as a foundation for creating learning experiences. We encourage faculty and degree programs to use the children's environ-

mental health competencies as the basis for developing these structural learning experiences so that the abilities learned translate into the workforce.

Future Implications

The American Public Health Association (2017) called for children's environmental health training of professionals who care for children as a way to reduce associated risks (i.e., from climate change) and maximize benefits from accessing healthy natural environments (Action Step #14 in the policy statement). The 12 competencies represent first steps toward developing a formal children's environmental health training for public health professionals. As the field grows, there could be a need to develop certification of children's environmental health specialists through a reputable organization such as the National Environmental Health Association. While the work group actively continues to focus on this goal, we encourage public health training programs, especially programs in institutes of higher learning, to consider incorporating these competencies into their environmental health and maternal and child health programs. ❁

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