

Westcarr-Gray, S., Taggart, L., Weiler, E., Havens, J., Oliver, P., & Gilkey (2023). Needs assessment of environmental health professionals in Montana: A post-COVID-19 perspective. *Journal of Environmental Health*, 86(2), 12–21.

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Note. This supplemental file contains background of the environmental health profession and was part of the manuscript submitted by the authors. Due to space limitations, editors of the *Journal of Environmental Health* have removed this

became acute by the end of the 18th century (Duffy, 1992). While health was a minor concern of those who led the fight for an adequate water supply, the dangers of fires also existed and was a priority in an age where open fires and candles were commonly used.

By 1753, New York City assumed full responsibility for maintaining and repairing all public wells and pumps. The city supported the construction of a reservoir and distribution system to convey water to residents and businesses. Even though the new conveyance system worked, it proved inadequate to meet all needs. While the project was later doomed by the start of the Revolutionary War, it led the way for a new water system some 25 years later (Duffy, 1992).

In the years following the Revolutionary War, cities such as Boston, New York, and Philadelphia continued to grow and enacted additional sanitation laws. In New York City, the growing demand for food also created profitable opportunities for aggressive business to monopolize industries which led to the rising spirit of free enterprise that clashed with the traditional regulations designed to protect consumers (Duffy, 1990).

In April 1796, the New York legislature enacted a comprehensive health law. The first 10 provisions of this health law established a permanent health office to enforce ordinances and the quarantine system. The New York Health Office was to consist of several appointed health commissioners, one of whom (a practicing physician) was to serve as the official health officer who authorized the city to pass additional sanitary ordinances pertaining to streets, vacant lots, nuisances, and the obnoxious trades (Duffy, 1992). Members of the health committee supported the role of government in public health and recognized that the public good must come first over the profit of free enterprise (Duffy, 1992).

As cities in the east continued to grow, so did the desire for clean and reliable water. From the public Cities began to dig public wells with Pittsburgh authorizing their first in 1802, agreeing to contribute to the cost of private wells if owners made them available to the public. In 1828, an 8-horsepower steam engine raised water from the Allegheny River to a reservoir 116 ft above the river and by 1832 Pittsburgh was adequately supplied with good water. None of the early water systems provided filtered or disinfected water. The quality of the water depended on its source, and while only the wealthy could afford to have water piped into their homes, most residents relied on standing pipes or hydrants located at intervals on street corners (Duffy, 1992). The role of sanitarians in public health continued to evolve as the U.S. prospered and grew. The U.S. Sanitary Commission was formed in 1861 (Powitz, n.d.). The civilian organization provided services to the armed forces of the U.S. Civil War 007 Tw [( )2 (g)2 (in)7ogin. C05 0 T66[(ba

and create prevention campaigns. They were charged with assigning quarantine officers across the country to limit the spread of disease (Duffy, 1992)

In Montana the disease spread rapidly, and city leaders discouraged public meetings and advocated for social distancing and wearing masks (Mullen & Nelson, 1987). The Montana Board of Health was adamant about stopping the spread of influenza and closed high businesses. Election halls were fumigated to prevent the spread of illness. Quarantine wardens enforced health ordinances, identified cases, posted notices, and levied fines for violations (Mullen & Nelson, 1987). The shortage of public health professionals resulted in a significant loss of life for those in rural locations. USPHS stepped in and provided additional medical personnel to help locally. The state epidemiologist estimated over one third of the population in Montana had contracted the disease with a fatality rate of 8.6 per 1,000 population (Mullen & Nelson, 1987).

Nationally, progressives continue to push for improved public health with opposition from several sectors including physicians and business. In 1922, the Sheppard-Towner Act was passed to address infant mortality. A survey of 86 cities across the US revealed that nearly one half of the cities surveyed had no full-time health officers or adequate birth or death record systems. Furthermore, only 56% of children living in the US were reported as .06 13.8p a

coordination, vectorborne illness prevention, and more. The estimated 100,000 EH professionals in the workforce today (BLS, 2022) make up approximately 10% of local health department personnel and 7% of the state department workforce responsible for the delivery of essential services by that address environmental related threats and determinants of health (Brooks, et al. 2019).

Most contemporary EH professionals are consistently engaged in multiple program areas and routinely respond to disasters and other emergencies like the recent COVID pandemic. EH professionals are strategically positioned in public health to monitor and diagnose EH problems, evaluate alternative solutions and work collaboratively with other public health and community professionals to develop and guide interventions that solve and/or prevent historic and emerging threats (Brooks et al, 2019).

EH professionals must develop and practice core competencies that were established through a consensus process and first published in 2001 (National Center for Environmental Health et al. 2001) and recently updated in 2020 (Martin & Latshaw, 2020). Core competencies include knowledge, skills, and abilities (KSAs) in assessment, information gathering, data analysis and interpretation, evaluation, management, problem solving; economic and political issues, organizational knowledge and behavior, project management, computer and information technology, reporting, documentation, and record keeping, communication, collaboration, educating others, conflict resolution, and marketing (Martin & Latshaw, 2020). The EH practice is guided by the 10 Essential Public Health Services which was released in 1994 and updated in 2021 by the Centers for Disease Control and Prevention (2023). Despite guiding principles and methods, there is no single uniform nationwide method for organizing and delivering EH services (DeSalvo et al., 2021; Tatala, 2019).

Variability also exists in the credentialing of EH professionals is not standardized nationally. EH professionals credentialed by NEHA make up the largest portion of certified EH professionals in the US. Professionals that meet the requirements may take a comprehensive test and earn the Registered Environmental Health Specialist Registered Sanitarian (REHS/RS)

## References

American Academy of Sanitarians. (n.d.). History of the American Academy of Sanitarians  
<http://www.sanitarians.org/page142>

Brooks, B.W., Gerding, J.A., Landeen, E., Bradley, E., Callahan, T., Cushing, S., Hailu, F., Hall, N., Hatch, T., Jurries, S., Kalis, M.A., Kelly, K.R., Laco, J.P., Lemin, N., McInnes, C., Olsen, G., Stratan, R., White, C., Wille, S., & Sarisky, J. (2019). Environmental health practice challenges and research needs for U.S. health departments.

U.S. Bureau of Labor Statistics. (2022). Environmental scientists and specialists.  
<https://www.bls.gov/ooh/life-physical-and-social-science/environmental-scientists-and-specialists.htm>