

▶ INTEGRATING PUBLIC HEALTH IN LAND REUSE AND REDEVELOPMENT

Editor's Note: The National Environmental Health Association is publishing a three-part series that highlights collaboration and partnerships with the Agency for Toxic Substances and Disease Registry (ATSDR) and redevelopment stakeholders to promote environmental health and land reuse as environmental and public health practices. This series will serve as a guide for identifying new and existing resources that can be adopted at the local environmental health level to safely reuse environmentally impacted land to improve community health outcomes. The conclusions in this series are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention and ATSDR.

Part 1: A 5-Step Land Reuse and Redevelopment Model: Resources to Spur Local Initiatives

Laurel Berman, MS, PhD
Agency for Toxic Substances
and Disease Registry

Miles Ballog
Cardno

Serap Erdal, PhD
University of Illinois
School of Public Health

Background

People who live near or access land reuse sites such as brownfields often experience disproportionate exposure to environmental pollution that can result in poor health outcomes, including higher rates of chronic disease, toxic exposures (e.g., mercury or lead-based paint) that result in adverse health effects, and cancer (de Leon & Schilling, 2017; Massey, 2004; New Jersey Department of Health and Senior Services, 2007). To address health risks and exposures related to land reuse sites, for over a decade the Agency for Toxic Substances and Disease Registry (ATSDR) internally integrated a public health model in land reuse and redevelopment—the 5-Step Land Reuse Strategy to Safely Reuse Land and Improve Health (5-Step Land Reuse Model).

In June 2015, ATSDR introduced the 5-Step Land Reuse Model during a 3-day training facilitated by the American Public Health Association. The purpose of the training was to introduce the 5-Step Land Reuse Model as a national model that could expand resources for health-focused land reuse at the local level.

The 5-Step Land Reuse Model Training

Over 65 individuals participated in the training. Participant came from ATSDR's Brownfields and Reuse Opportunity Working Network (BROWN), community partnerships, and grantees (an ATSDR funding program from 2008–2016). The authors represent

each of these participant groups. The training was based around the 5-Step Land Reuse Model shown in Figure 1. A brief description of the training based on each of the model's steps is provided below.

Step 1: Engage With the Development Community

Participants shared and practiced using community engagement techniques, such as plain language (www.plainlanguage.gov) and community engagement games. ATSDR grantees shared successful community engagement techniques, such as funding of *promotores de salud* (community health workers), in which community members educate and engage their communities about land reuse sites, environmental concerns, and associated health outcomes.

Step 2: Evaluate Environmental and Health Risks

This session was grounded in environmental health basics that included definitions and significance of exposure sources, media, pathways, toxicology, and cancer and non-cancer risks. Participants learned about and practiced using the following tools:

- health impact assessment (Centers for Disease Control and Prevention [CDC], 2016),
- Protocol for Assessing Community Excellence in Environmental Health (CDC, 2017),
- Healthy Community Design Checklist (CDC, 2013),

- ATSDR Brownfields/Land Reuse Action Model (ATSDR, 2015),
- ATSDR Land Reuse Site Screening Tool (ATSDR, 2018), and
- community-based participatory research (Zubaida, Grunbaum, Gray, Franks, & Simoes, 2007).

Step 3: Communicate Risk or Health Issues to the Development Community

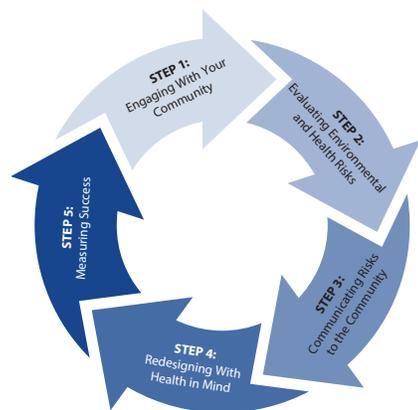
This session emphasized the importance of health risk communication in community buy in for redevelopment. Expert risk communicators described basics of overall health communication, led role-playing scenarios that result in positive or negative risk communication, and provided examples of real-world community-based risk communication activities they perform.

Step 4: Redesign the Community With Health in Mind

This session described redevelopment planning approaches to maximize health outcomes across physical, social, and economic health spectrums. Examples such as energy efficiency, stormwater management, tree planting, nonmotorized transportation (e.g., bicycling infrastructure), and agriculture to improve food access and build local economies were provided and supported by case examples and best practices. In addition, BROWN provided targeted technical assistance to each community partnership.

FIGURE 1

The Agency for Toxic Substances and Disease Registry 5-Step Model to Safely Reuse Land and Improve Health (5-Step Land Reuse Model)



Step 5: Measure Success: Environment and Health Change

This session emphasized the importance of evaluating how environmental remediation or restoration can lead to changes in health and environment over the course of redevelopment. The ATSDR Action Model was highlighted as a redevelopment tool for including measurable indicators as benchmarking outcomes. Example indicators are shown in Table 1.

Outcomes: The 5-Step Land Reuse Model as a National Resource

The 2015 training provided a rich repository of land reuse and redevelopment resources, success stories, lessons learned, and opportunities for collaboration. Shortly after the training, ATSDR developed the Land Reuse Toolkits to elevate the 5-Step Land Reuse Model for public use. ATSDR incorporated the input of the training participants who essentially represented the five personas of the toolkits: community champions, community planner, municipal agency, environmental or health professional, and developer. ATSDR included in each toolkit resources from the training and from a book authored by BROWN members, *Land Reuse and Redevelopment: Creating Healthy Communities* (Berman & Whitehead, 2018).

TABLE 1

Issue and Corresponding Redevelopment Indicator Examples

Issue	Indicator
Pollution of river	Water quality monitoring data
Contaminated properties	Inventory of the number of contaminated properties and types and nature of contamination
Odor from waste transfer facility/rodents	Odor survey, rodent control data
Habitat concerns	Wildlife survey, environmentally friendly lighting installations, habitat preservation efforts
Lead from past industrial activities and older housing stock	Blood-lead level data, age and condition of housing and commercial/ industrial properties, inventory of lead emissions
Air pollution	Asthma and/or other respiratory ailment incidence rates, number of major highways and proximity to them, number and type of industrial facilities emitting pollutants into the atmosphere
Lack of access to green space and recreation	Number of parks and acreage of open/green spaces, number of people using parks, types of recreation observed
Lack of access to fresh foods and vegetables	Number of urban gardens, number of grocery stores in the neighborhood
Lack of access to medical care	Number and type of clinics and healthcare providers in the redevelopment area
Neighborhood blight and economic condition	Number of vacant homes and land, number of boarded homes and/or properties, number of foreclosures, number of closed businesses or inactive commercial activity

The 2015 training also launched participant collaborations. One collaboration resulted in a European Union Erasmus award for a 2018–2019 faculty and student exchange on health-focused land reuse between universities in Romania and the U.S. In another collaboration, two BROWN members and two community partnerships successfully applied for a Robert Wood Johnson Foundation Culture of Health Leaders Program advocating for “healthfields” (i.e., safe reuse of land to reduce exposures and achieve environmental and community health improvements). They received \$380,000 for individual healthfields projects in target communities over 3 years (2016–2019).

Recently, ATSDR and the National Environmental Health Association (NEHA) collaboratively designed an online certificate program in environmental health and land reuse based on the 5-Step Land Reuse Model. The certificate program includes environmental health basics of epidemiology, land reuse and redevelopment, risk assessment, risk communication, and toxicology. The certificate program is scheduled to launch in

2019 and will be provided free of charge for continuing education by ATSDR with a dual certificate offered by NEHA.

Conclusion

The June 2015 training participants represented interest groups frequently at the table in community-driven land reuse and redevelopment projects. Ultimately, the training led to several participant collaborations, the development of the Land Reuse Toolkits, and the creation of the ATSDR and NEHA environmental health and land reuse certificate program. Overall, the training met ATSDR’s goal to elevate the internal 5-Step Land Reuse Model into a national model to support local health-focused redevelopment projects. 🐾

Corresponding Author: Laurel Berman, Environmental Health Scientist, Agency for Toxic Substances and Disease Registry, Chicago Office, 77 West Jackson Boulevard, Suite 433, ATSD-4J, Chicago, IL 60604. E-mail: laberman@cdc.gov.

References on page 38

References

Agency for Toxic Substances and Disease Registry. (2015). *ATSDR action model*. Retrieved from <https://www.atsdr.cdc.gov/sites/brownfields/model.html>

Agency for Toxic Substances and Disease Registry. (2018). *ATSDR brownfields/land reuse site tool*. Retrieved from https://www.atsdr.cdc.gov/sites/brownfields/site_inventory.html

Berman, L., & Whitehead, S. (Eds.). (2018). *Land reuse and redevelopment: Creating healthy communities* [In press]. Denver, CO: National Environmental Health Association.

Centers for Disease Control and Prevention. (2013). *Healthy community design checklist toolkit*. Retrieved from <https://www.cdc.gov/healthyplaces/toolkit>

Centers for Disease Control and Prevention. (2016). *Health impact assessment*. Retrieved from <https://www.cdc.gov/healthyplaces/hia.htm>

Centers for Disease Control and Prevention. (2017). *PACE EH: Protocol for assessing community excellence in environmental health*. Retrieved from https://www.cdc.gov/nceh/ehs/ceha/pace_eh.htm

de Leon, E., & Schilling, J. (2017). *Urban blight and public health: Addressing the impact of substandard housing, abandoned buildings, and vacant lots*. Washington, DC: Urban Institute. Retrieved from https://www.urban.org/sites/default/files/publication/89491/2017.04.03_urban_blight_and_public_health_yprn_report_finalized.pdf

Massey, R. (2004). *Environmental justice: Income, race, and health*. Medford, MA: Global Development and Environment Institute, Tufts University.

New Jersey Department of Health and Senior Services. (2007). *Health consultation: Mercury exposure investigation using serial urine testing and medical records review*. Atlanta, GA: U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry.

Zubaida, F., Grunbaum, J.A., Gray, B.S., Franks, A., & Simoes, E. (2007). Community-based participatory research: Necessary next steps. *Preventing Chronic Disease*, 4(3). Retrieved from https://www.cdc.gov/pcd/issues/2007/jul/06_0182.htm

Did You Know?

NEHA is pleased to announce the 2019 National Environmental Public Health Internship Program. The program enables students to gain a firsthand perspective on the day-to-day responsibilities of environmental health professionals. Local, state, and tribal environmental health departments can apply to host one of the internships. The deadline for student and health department applications is January 18. Learn more at www.neha.org/professional-development/students/internships.



CP-FS/CCFS

Join the growing ranks of professionals who have attained NEHA's most in-demand credentials in food safety. Whether your focus is retail foodservice or food manufacturing and processing, NEHA's Certified Professional—Food Safety (CP-FS) and Certified in Comprehensive Food Safety (CCFS) credentials demonstrate you went the extra mile to get specialized knowledge and training in food safety. Give yourself the edge that is quickly being recognized, required, and rewarded in the food industry.

Learn more at neha.org/professional-development/credentials.



A credential today can improve all your tomorrows.

