

HEALTHY HOUSING DATABOOK 2010



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LETTER FROM THE DIRECTOR

Dear Colleagues,

Our recent economic crisis has put a spotlight on the connection between health and housing. As people lose their homes to foreclosure or other financial crises, living a healthy lifestyle becomes more difficult. In 2009, lead poisoning rates did not decline as in previous years, obesity rates increased, and the number of children suffering from asthma was higher than ever. How do we reverse these trends?

The United States Surgeon General's *Call to Action to Promote Healthy Homes* provides a blueprint for improving the health of all Rhode Island residents. The publication provides lists of actions we can all take, whether we represent community groups, lenders, government officials, educators, property owners, or concerned parents. For those who feel that there is little they can do to reverse the current trends in health and housing, I invite you to review the *Call to Action* and see if there isn't at least one activity that you feel you could work on with the members of our statewide Healthy Housing Collaborative.

We can all join in celebrating the successes we have already achieved in Rhode Island. Many have answered the *Call to Action*. Weatherization programs conduct comprehensive evaluations of hazards from lead to carbon monoxide, healthy homes and environmental health training is part of the curricula for Rhode Island nursing students, and private inspectors and home visiting professionals are providing data from healthy housing checklists to the Rhode Island Department of Health.

I would like to repeat the invitation I made in 2008 to partner with the Department of Health in this important work by joining our Healthy Housing Collaborative (Magaly.Angeloni@health.ri.gov). The value of partnerships is perhaps the biggest lesson I have learned from our response to the H1N1 flu epidemic. The success of our vaccination campaign was a result of the desire and ability of school officials, medical providers, hospitals, local and state officials, and an army of volunteers to work together. There is no reason why this strategy can't also work for addressing our housing needs. The Healthy Housing Collaborative provides an opportunity for those wanting to improve housing to work with similarly dedicated colleagues.

Thank you for your continuous support in promoting healthy environments for children and families in Rhode Island.

Sincerely,

A handwritten signature in black ink, appearing to read "David R. Gifford MD MPH".

David R. Gifford, MD, MPH

Director of Health

HEALTHY HOUSING COLLABORATIVE MEMBERSHIP

BLACKSTONE VALLEY COMMUNITY ACTION PROGRAM
BROWN UNIVERSITY
CHILD INC. RHODE ISLAND
CHILDHOOD LEAD ACTION PROJECT
CHILDREN'S FRIEND AND SERVICE
CITY OF PAWTUCKET
CITY OF PROVIDENCE
CITY OF WARWICK
CITY OF WOONSOCKET
CLEARCORPS PROVIDENCE
EAST BAY COMMUNITY ACTION PROGRAM
FERLAND CORPORATION
GOVERNOR'S COMMISSION ON DISABILITIES
HOUSING NETWORK RHODE ISLAND
LIFESPAN
LUNG ASSOCIATION OF RHODE ISLAND
NEIGHBORHOOD HEALTH PLAN OF RHODE ISLAND
OCEAN STATE CENTER FOR INDEPENDENT LIVING
RHODE ISLAND BUILDING COMMISSION
RHODE ISLAND COALITION FOR THE HOMELESS
RHODE ISLAND COMMITTEE ON OCCUPATIONAL SAFETY AND HEALTH
RHODE ISLAND DEPARTMENT OF HEALTH
RHODE ISLAND DEPARTMENT OF HUMAN SERVICES
RHODE ISLAND HOUSING
RHODE ISLAND HOUSING AND URBAN DEVELOPMENT TENANT PROJECT
RHODE ISLAND HOUSING RESOURCES COMMISSION
RHODE ISLAND KIDS COUNT
RHODE ISLAND LEGAL SERVICES
RHODE ISLAND OFFICE OF ENERGY RESOURCES
ST. JOSEPH'S LEAD CENTER
THE PROVIDENCE PLAN
UNITEDHEALTHCARE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WESTBAY COMMUNITY ACTION PROGRAM

INTRODUCTION

Two recent events have made a big difference in the world of healthy communities. In June 2009, the United States Surgeon General issued the *Call to Action to Promote Healthy Homes* (www.surgeongeneral.gov/topics/healthyhomes) describing steps that people can take to protect themselves from disease, disability, and injury that may result from health hazards in their houses. Most recently, in early 2010, the Surgeon General issued a publication with her *Vision for a Healthy and Fit Nation* (www.surgeongeneral.gov/library/obesityvision) inviting the nation to create neighborhood communities that are focused on healthy nutrition and regular physical activity, where the healthiest choices are accessible for all citizens.

The concept of housing influencing health goes back to the 1800s, in the time of Florence Nightingale, who stated that, “the connection between the health and the dwelling of the population is one of the most important that exists.” It was then understood that housing can cause or contribute to numerous illnesses and injuries.

In the last few years, the federal government has made significant efforts to provide funding and identify policies that support housing that promotes positive health outcomes. Much has been done during this time to better understand the concepts and steps to make a home “healthy”. The National Center for Healthy Housing has developed seven

“The connection between health and dwelling is one of the most important that exists.”
— Florence Nightingale

key principles of healthy housing. According to these principles, a healthy home is one that is:

- *Dry*: Damp houses provide a welcoming environment for mites, roaches, rodents, and molds, all of which are associated with asthma.
- *Clean*: Clean homes reduce children’s exposure to contaminants and are less likely to harbor household pests.
- *Pest-Free*: Mice and cockroaches can trigger asthma in some children. The pesticides used to rid homes of household pests can also exacerbate health problems.
- *Safe*: A majority of injuries to children occur in the home. Falls are the most frequent cause of residential injuries to children, followed by injuries from objects in the home, burns, and poisonings.
- *Contaminant-Free*: Many contaminants found in the home pose risks to children’s health. These contaminants can include lead, radon, asbestos, pesticides, carbon monoxide, volatile organic compounds, and second-hand tobacco smoke.
- *Ventilated*: Research shows that having a well-ventilated home improves respiratory health.
- *Maintained*: Homes that are poorly maintained may have excessive moisture, pest problems, or deteriorating lead paint, all of which pose health risks to children.

In 2009, Rhode Island developed an outreach campaign geared toward elementary school

students to promote the seven steps to a healthy home. The campaign includes weekly planners, bookmarks, and a video describing the characteristics of a healthy home, and also provides a guide that teachers can use to incorporate the healthy housing concept into classroom discussion. Details and campaign materials can be found and ordered online at www.health.ri.gov/healthyhousing.

The concepts of healthy housing and a fit nation complement each other. The Surgeon General's publications make a compelling case for this connection and invite individuals, families, property owners, maintenance workers, community and faith-based organizations, healthcare providers, home

visiting agencies, lenders, developers, home builders, inspectors, educators, academic and research organizations, scientists, and the government to play a role in promoting these goals.

Regardless of the work you do, there is likely to be a component of your work that relates to healthy lifestyles. To simplify these concepts, we have summarized them in a table on the facing page.

This databook intends to share ways in which Rhode Island is measuring progress and information about how the state is responding to the Surgeon General's *Call to Action* now and in the future.



Promoting Healthy Homes and Healthy Lifestyles

WHO? • Healthcare providers, individuals, families, schools, communities, faith-based organizations, government, educators, researchers

WHAT? • Promote healthy behaviors and healthy lifestyles
• Establish policies, procedures, and practices that support healthy lifestyles
• Create healthier environments
• Conduct public awareness to promote healthy lifestyles

WHERE? • Homes, schools, child care settings, workplaces, healthcare settings, communities

WHY? • Unhealthy behaviors and settings affect the health of millions of people, regardless of income, geography, or background. These people may have medical conditions such as lead poisoning, diabetes, or heart disease.

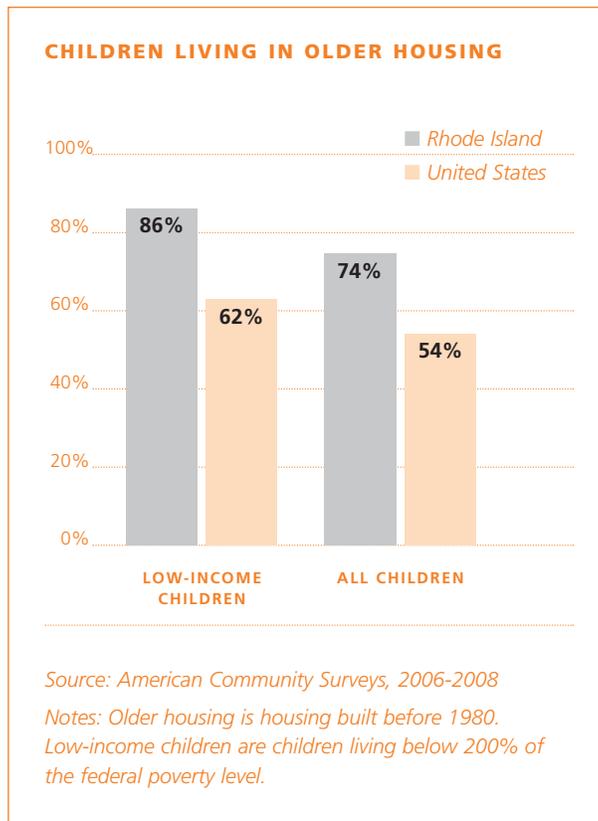
HOW? • Ensure healthy, safe, affordable, and accessible homes
• Increase public awareness and promote health literacy
• Conduct healthy homes research
• Translate research into practice and policy
• Create a healthy home environment (increase healthy food choices and physical activity, limit television and computer use, prevent injuries and poisonings, etc.)
• Create healthy child care settings
• Create healthy schools
• Create healthy worksites
• Mobilize the medical community
• Improve our communities
• Improve air and water quality

INDICATORS OF HEALTHY HOUSING

At the Rhode Island Department of Health, the movement toward a more comprehensive approach to addressing the range of housing problems that influence health had its start in the Childhood Lead Poisoning Prevention Program. Advocates for lead poisoning prevention had long recognized that families with lead poisoned children face problems that extended far beyond lead. Client families were

often overwhelmed by poverty, isolation, safety, and housing code issues that ranged from pests to unsafe furnaces. State and municipal programs that were initiated to finance lead abatement quickly found that leaking roofs and other housing problems had to be addressed before lead abatement could begin. The need to switch from a less categorical to a more comprehensive approach to housing problems was also recognized by federal agencies that funded state and local lead poisoning prevention activities.

Rhode Island's surveillance of lead screening levels provides the quantitative data needed to



clearly define the lead poisoning problem and evaluate the effectiveness of programs designed for lead poisoning prevention. In contrast, no such database exists to evaluate the nature of healthy housing in Rhode Island. As the introduction to this booklet illustrates, simply defining Healthy Housing is challenging. The measures used to define Healthy Housing—dry, clean, pest-free, safe, contaminant-free,

ventilated, and maintained—are subjective, so data collection is difficult. Developing quantitative measures is a key step toward improving the status of healthy housing. Indicators derived from available data were needed as surrogates for the seven steps to healthy housing. Many of the same advocates who helped form the Healthy Housing Collaborative were involved in developing two key indicators of healthy housing. These two indicators are the percentage of children living in older housing (built before 1980) and the percentage of low-income children (less than 200% of the federal poverty level) living in older housing. These data are from the 2006-2008 American Community Surveys (three-year average).

Based on this survey, children in low-income families living in Rhode Island and across the nation are more likely to live in older housing than other children. From 2006 to 2008, 86% of low-income children in Rhode Island lived in older housing compared to 74% of all children. Rhode Island has the highest percentage of low-income children in the nation living in older housing.

These indicators provide a useful surrogate to measure healthy housing only to the extent that the age of housing relates to unhealthy housing conditions. Obviously, many older, well-maintained homes are desirable, safe, and healthy places to live, while some poorly constructed and poorly

maintained newer homes are less healthy. However, the older the home, the more likely that lead, asbestos, and other hazards may be present. These indicators can be improved by having address-specific data on housing conditions. Computerized records of housing code violations and case management reports may provide future sources of data.

In addition to age of housing and percentage of children living in poverty, lead poisoning rates also provide an indicator of the status of housing. Maps 1, 2, and 3 on the following page illustrate these three indicators by census tract statewide. Combining these three measures into a single healthy housing indicator may provide a better



assessment of the overall status of the housing for a census tract or community (Map 4).

These maps only suggest areas of unhealthy housing. Address-specific data on pests, mold, asthma, furnace maintenance, smoke-free leases, and other indicators of healthy housing would enhance the overall indicator. The limitations of the indicators shown in the chart and maps included in this section do not obscure the nature of the healthy housing challenge in Rhode Island—the state houses too many of its children in old houses within neighborhoods affected by poverty.

MAPS 1 AND 2

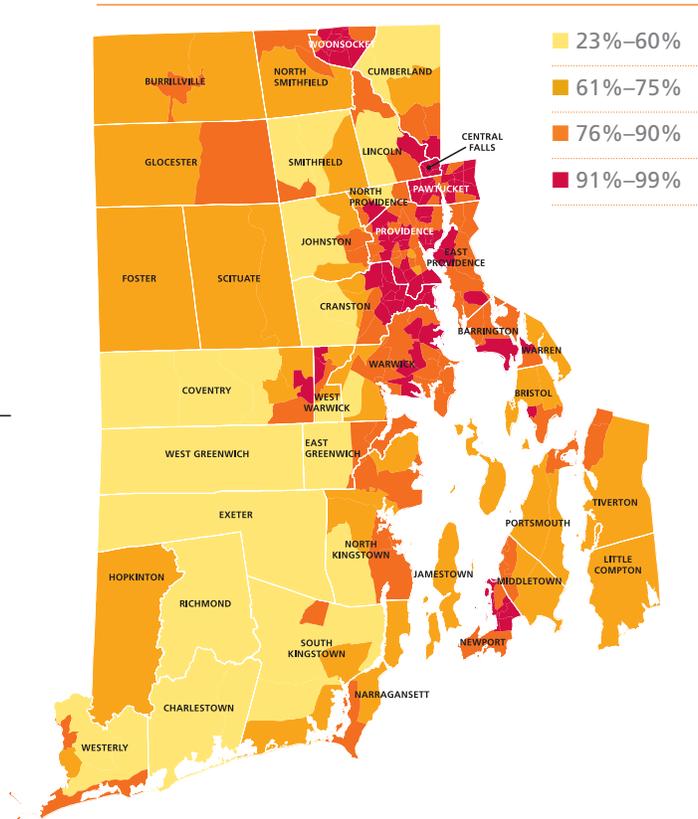
Source: United States Census Bureau, Census 2000

MAP 3

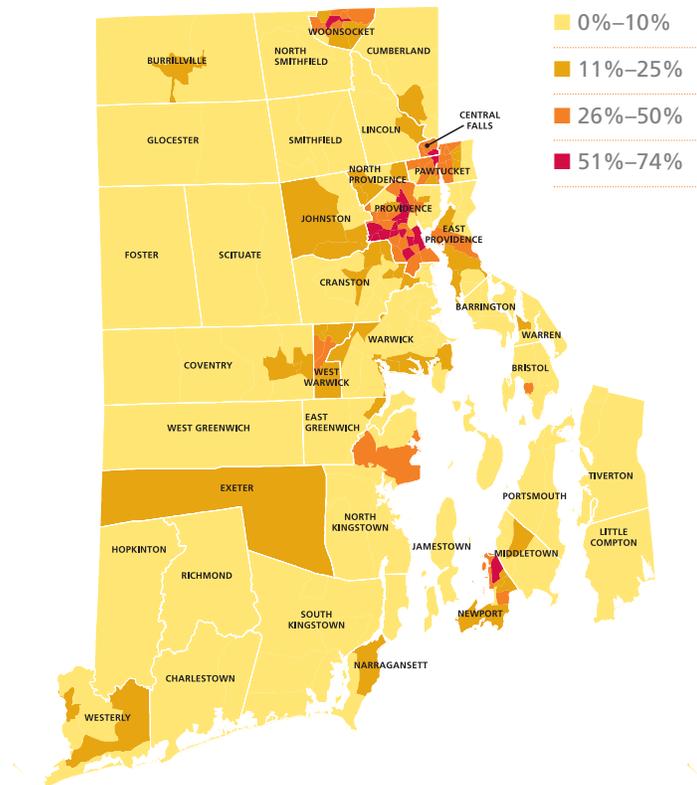
Source: Rhode Island Department of Health Lead Elimination Surveillance System, 1994–2008

Note: An elevated blood lead level is one blood lead test $\geq 10 \mu\text{g/dL}$.

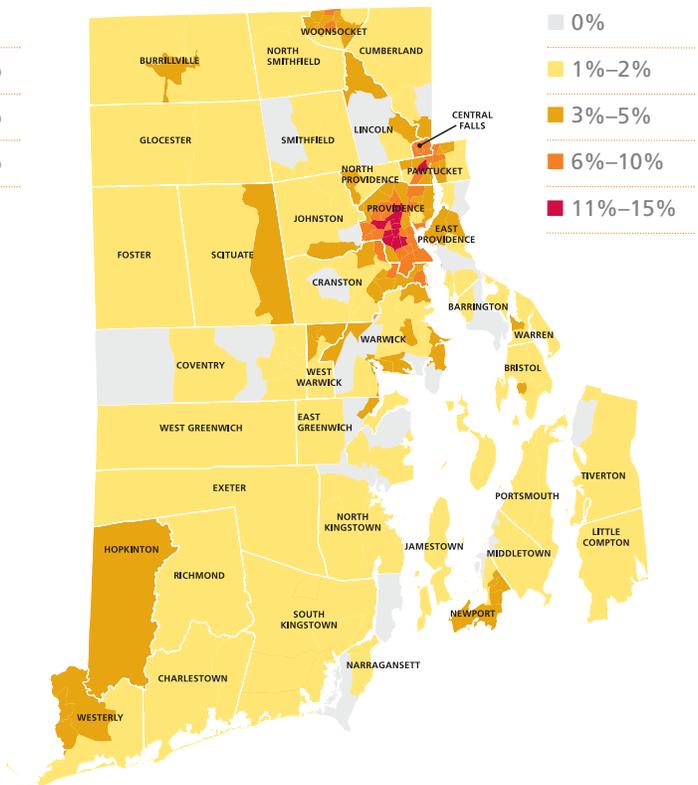
MAP 1. HOUSING BUILT BEFORE 1980



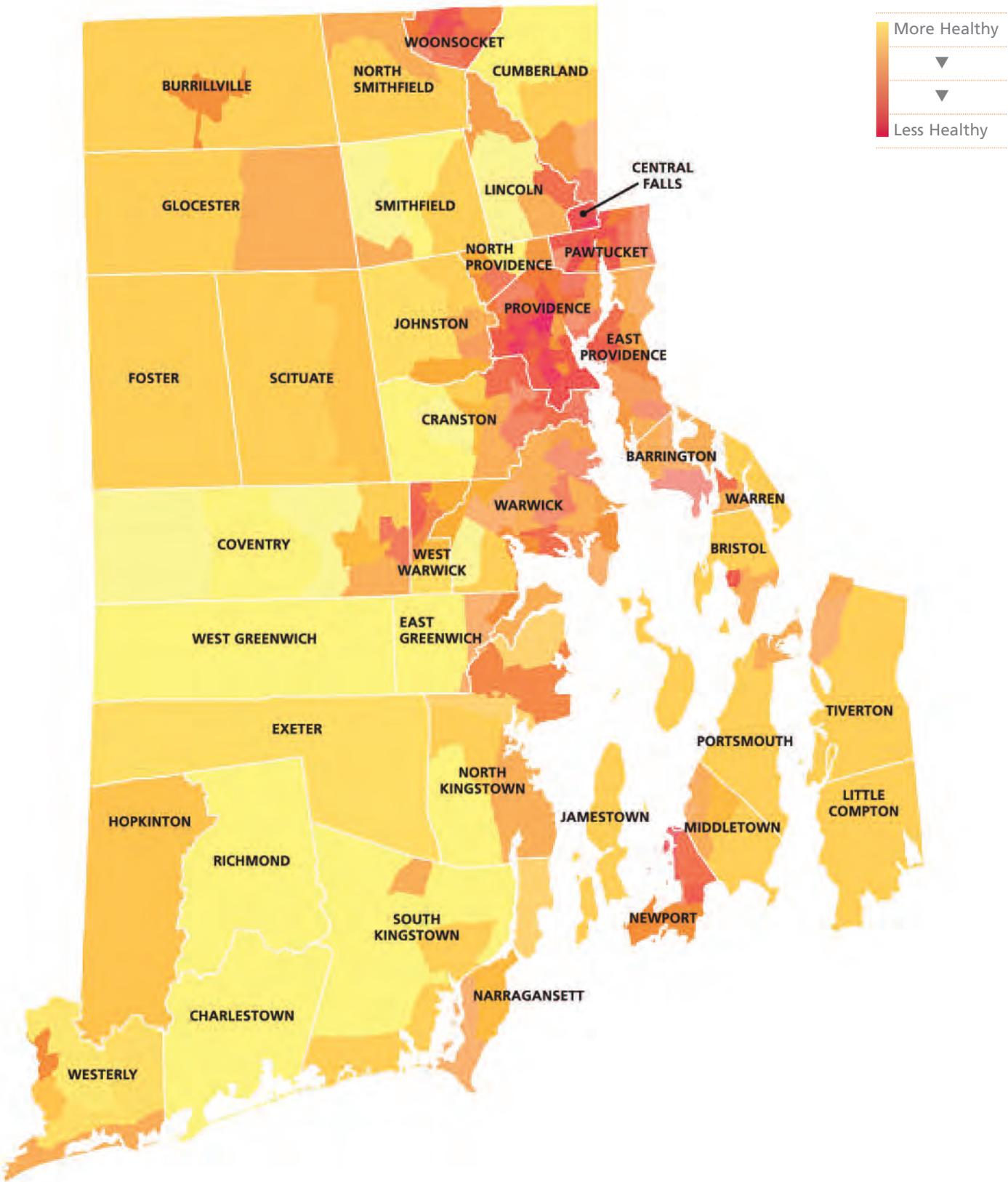
MAP 2. CHILDREN YOUNGER THAN SIX YEARS OLD LIVING BELOW POVERTY, 2000



MAP 3. CHILDREN YOUNGER THAN SIX YEARS OLD WITH ELEVATED BLOOD LEAD LEVELS, 1994–2008



MAP 4. COMPOSITE OF MAPS 1, 2, AND 3



ASBESTOS

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND ASBESTOS?

Asbestos is a naturally occurring mineral with several unique properties. Asbestos is strong, flexible, resistant to heat and chemical corrosion, and insulates well. These features led to the use of asbestos in up to 3,000 consumer products before government agencies began to phase it out in the 1970s because of its health hazards. Asbestos has been used in insulation, roofing, siding, vinyl floor tiles, fireproofing materials, textured paint, soundproofing materials, heating appliances (such as clothes dryers and ovens), and ironing boards. Many of these materials are still present in our homes.

Much of the housing nationally and in Rhode Island was constructed before the phase-out of asbestos products. In fact, most of Rhode Island's housing was built before 1950. Exposure to asbestos is a health concern when high concentrations of asbestos fibers are inhaled over an extended period of time. A home may contain a number of asbestos-containing materials that have become damaged over time, which can lead to increased exposure.

WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

When asbestos fibers are inhaled, they are deposited deep into the lungs and can cause serious diseases such as asbestosis, mesothelioma, and lung cancer.

Exposure to asbestos is a health concern when high concentrations of asbestos fibers are inhaled over an extended period of time.

The risk for all of these conditions is amplified as the number of inhaled fibers increases. Smokers who inhale asbestos fibers are at even greater risk for lung cancer.

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY ASBESTOS EXPOSURE?

Neglected asbestos in the home is a dangerous air contaminant and may significantly contribute to an occupant's exposure. Some common products that contained asbestos in the past and conditions that may release fibers include the following:

- Steam pipes, boilers, and furnace ducts insulated with asbestos. These materials may release fibers if damaged, repaired, or removed improperly.
- Resilient floor tiles (vinyl asbestos), the backing on vinyl floor sheeting, and adhesives used for installing floor tile. Sanding or abrading tiles can release fibers, as well as scraping or sanding the backing of sheet flooring for removal.
- Patching and joint compounds for walls, ceilings, and textured paints. Sanding, scraping, or drilling these surfaces may release asbestos.
- Soundproofing and decorative materials sprayed on walls and ceilings. Loose, crumbling, or water damaged material, as well as sanding, scraping, or drilling the material, may release fibers.
- Asbestos shingles, siding, and cement roofing. These products may release fibers when sawed, cut, drilled, or sanded.



- Door gaskets in furnaces and wood and coal stoves. Worn seals can release fibers during use.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THE PROBLEM?

Lung cancer is the most significant health risk of asbestos exposure, but it is difficult to determine precisely which cases are asbestos-related. The Centers for Disease Control and Prevention's (CDC) Environmental Working Group estimates that 10,000 lung cancer deaths per year are related to asbestos.¹

The maintenance and handling of asbestos-containing materials is highly regulated in public and commercial buildings, particularly in schools. It is estimated that asbestos is present in nearly 700,000 public and commercial buildings throughout the United States and is in a damaged condition in approximately 500,000 of those buildings.

There is little data regarding asbestos conditions in the nation's housing. In Rhode Island, a large

percentage of homes were constructed before 1970, many with asbestos-containing materials that may be damaged or could become damaged if improperly handled or removed.

WHAT CAN INDIVIDUALS, FAMILIES, PROPERTY OWNERS, AND MAINTENANCE WORKERS DO TO ADDRESS ASBESTOS?

- Become educated on the risks of asbestos and learn to identify probable asbestos-containing materials in the home.
- Learn how to maintain asbestos-containing materials.
- Do not disturb asbestos-containing materials that are in good condition. If the material is damaged or you plan to repair or renovate parts of your home that may contain asbestos, hire a professional.

¹ Wiles R. *Environmental Working Group Action Fund Estimate For Asbestos Deaths (2002)*. Centers for Disease Control and Prevention, NCHS, *National Vital Statistics Reports, Deaths: Preliminary Data for 2002, Volume 52, Number 13, February 2004*.

ASTHMA

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND ASTHMA?

Asthma is a chronic disease of the respiratory system in which the airways, or tubes that carry oxygen in and out of the lungs, occasionally become swollen, inflamed, and lined with excessive amounts of mucus. These episodes, called asthma attacks, can be triggered by many factors in the home, including things like secondhand smoke, dust mites, cockroaches, rodents, mold, pet dander (e.g., from cats, dogs, and birds), smoke (e.g., from wood burning stoves or kerosene heaters), strong odors and sprays (e.g., perfumes, air fresheners, paints, and cleaning solutions), and sulfites in foods (e.g., beer, wine, shrimp, dried fruit, and processed potatoes).

Asthma cannot be cured, but it can be controlled. Taking asthma medication as prescribed and avoiding triggers can help a person with asthma avoid an attack. Asthma that is not well managed can result in emergency room visits, hospitalizations, loss of school and work days, and a lower quality of life.

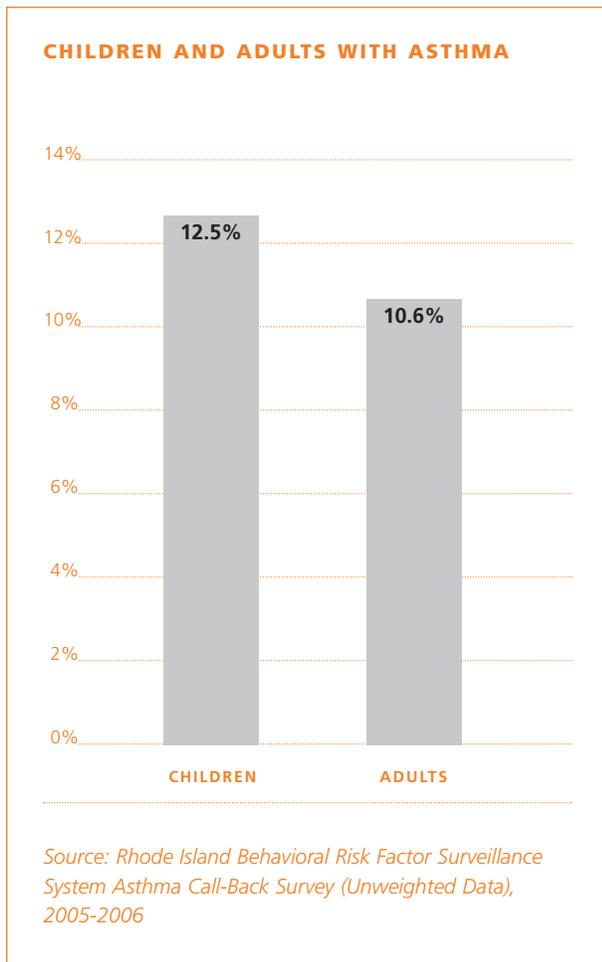
Keeping a home free of asthma triggers can drastically reduce symptoms in people with asthma.

WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

Many factors have been shown to increase the risk of

developing asthma and of having more severe asthma once a person has the disease. One of the most important surveys for identifying the number of people living with asthma is the Behavioral Risk Factor Surveillance System (BRFSS) and the associated Asthma Call-Back Survey. The 2008 BRFSS Asthma Call-Back Survey showed that people are taking important actions to modify their homes to decrease exposure to asthma triggers, including an increasing number of people (approximately 30%) using mattress and pillow covers designed to control dust mites. However, more work needs to be done. Carpeting can hold and attract dust mites and other allergens and should be removed, when possible, from bedrooms where children and adults with asthma sleep. Pets should not be allowed in bedrooms. Enacting these and similar changes along with installing air purifiers and using kitchen exhaust fans can help make a home healthier for children and adults with asthma.

Living with asthma can be challenging. Lifestyle and environmental changes can help people with asthma avoid what brings on—or triggers—their asthma symptoms. Triggers differ for each person, so it often takes time for a person with asthma to figure out what triggers their asthma symptoms. In addition to lifestyle and environmental changes in the home, asthma medication helps prevent and control asthma symptoms.



HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY ASTHMA?

It is critically important to keep a home free of asthma triggers to drastically reduce symptoms in people with asthma. The narrowing of the airways that occurs during an asthma attack can cause wheezing, shortness of breath, chest tightness, and coughing, and the severity of these symptoms can range from mild to life threatening.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THIS PROBLEM?

Results from the 2008 BRFSS indicate that between 10% and 15% of Rhode Island children age 17 and younger, and between 9% and 12% of Rhode Island adults age 18 and older, currently have doctor-diagnosed asthma. The BRFSS Asthma Call-Back Survey asks in-depth questions of a sample of people who said they had doctor-diagnosed asthma when interviewed for the BRFSS. These data provide important details about a person with asthma’s life, environment, and health, as summarized on the following page.

WHAT CAN INDIVIDUALS, FAMILIES, PROPERTY OWNERS, AND MAINTENANCE WORKERS DO TO ADDRESS ASTHMA?

There are many household hazards that can trigger asthma attacks. Preventing these triggers requires that household occupants take multiple precautions. The community can help with preventive measures during the building and maintenance of a property, specifically:

- Install proper ventilation on the outside of the house to minimize moisture problems in damp areas.
- Routinely inspect houses for sources of moisture and take steps to eliminate each source or cause.
- Install vapor barriers in crawl spaces.
- Develop a smoke-free policy in multiple-unit rental properties.

- Develop a policy for proper disposal of trash and garbage to reduce pests in rental properties.
- Do not allow smoking in the home.
- Keep the home free of dust, mold, and other potential asthma triggers.
- Use allergen-resistant mattress and pillow covers.
- Keep pets outdoors and away from sleeping areas.
- Remove carpeting.
- Keep people out of the room while vacuuming. If possible, purchase a vacuum with a high efficiency particulate air (HEPA) filter.
- Keep food and garbage in closed containers.
- Dispose of trash and garbage promptly to reduce pest problems in the home.
- Use poison baits, powders, gels, paste, or traps to help eliminate cockroaches.
- Use cleaners that are not known to trigger an asthma attack.
- If possible, avoid using wood burning stoves, kerosene heaters, fireplaces, unvented gas stoves, or heaters.
- Take all asthma medication as prescribed.

Among Rhode Island Adults Living with Asthma

QUALITY OF LIFE

45% responded that they are limited a little to a lot in the activities they are able to do.

31% reported having symptoms in the last week.

HOUSING TRIGGERS

61% indicated that they had carpeting or rugs in their bedroom.

44% allowed pets in bedrooms.

HOUSING PREVENTIVE FACTORS

31% had been advised by a health professional to change things in their home, school, or work to improve their asthma.

57% of people regularly used a kitchen exhaust fan that vents to the outside of the house.

30% responded that they use mattress covers designed to control dust mites.

29% reported using pillow covers designed to control dust mites.

19% said they use air cleaner or purifiers to filter dust, pollen, mold, and chemicals out of the indoor air.

Source: Rhode Island Behavioral Risk Factor Surveillance System Asthma Call-Back Survey (Weighted Data), 2008

DRINKING WATER

In Rhode Island, public water supply systems are regulated by the Department of Health in accordance with the federal Safe Drinking Water Act. “Community” public water systems run by certified operators serve about 85% of Rhode Island homes. These systems regularly conduct tests for more than 100 potential contaminants and report findings in their annual *Consumer Confidence Report*. Private wells, regulated by local housing officials with assistance from the State’s Private Well Program, must be tested prior to occupancy of new homes, transfer of ownership, or the connection of new wells to existing homes.

Protecting drinking water reservoirs and aquifers from sources of contamination enhances confidence in the safety of drinking water.

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND DRINKING WATER?

Safe drinking water is one of the basic requirements of healthy housing. Protecting drinking water reservoirs and aquifers from sources of contamination enhances confidence in the safety of drinking water. Poorly controlled sources of contamination include septic systems, fertilizers, insecticides, and herbicides as well as gas stations, petrochemical tank farms, and landfills. Certain contaminants, such as coliform bacteria and lead, also tend to have residence-specific sources that are more prevalent in older, poorly maintained homes, regardless of whether the water source is public or private.



WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

Routine water quality monitoring provides direct evidence of the presence or absence of contaminants in drinking water. Public water systems have the advantage of the shared resources of their rate-paying customer base to comprehensively monitor potential contaminants. Public water systems provide monitoring data to their customers by mailing them a *Consumer Confidence Report* each year, generally with their water bill. In contrast, private well owners generally conduct minimal, if any, monitoring.

In addition to monitoring for contaminants at the drinking water plant, public water systems analyze water from a representative sample of their customers' homes, particularly those customers at the highest risk for having copper or lead contamination in their water. Even when the water supply is free of lead contamination, pipes, fittings, and fixtures, especially in older housing, can contain lead. The Department of Health also tests drinking water at the homes of families with children with significant lead poisoning. Significant lead poisoning is defined as a venous blood lead level greater than or equal to 20 micrograms per deciliter ($\mu\text{g}/\text{dL}$) in a child younger than six years of age, or two venous blood lead levels in the 15 to 19 $\mu\text{g}/\text{dL}$ range in a child younger than six years of age tested between 90 and 365 days apart. In 2009, all water samples taken when conducting a lead inspection offered by the Department of Health had lead levels below the EPA action level (15 parts per billion).

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY DRINKING WATER PROBLEMS?

Municipal financial shortfalls are often associated with delayed repair of public water systems and distribution lines. Low water pressure, broken faucets, unsanitary storage reservoirs, dead end lines, and stagnation increase the risk of bacteria in the water. In some homes, high lead levels are associated with older plumbing, where lead solder was used to connect pipes and where taps were made with brass alloys containing lead.

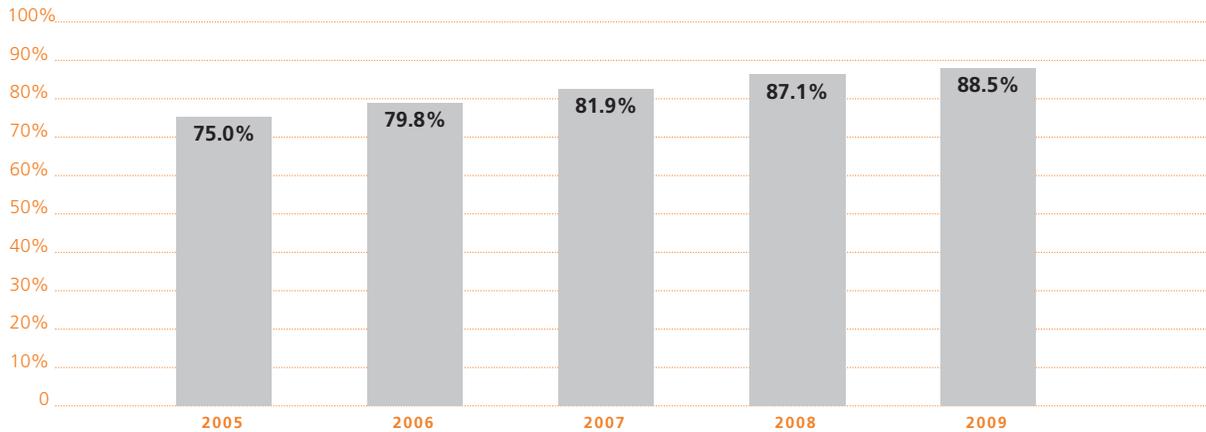
Although the age of housing is a risk factor for lead pipes and solder, recent remodeling activity or service line replacement may be risk factors for lead in drinking water. New fixtures leach lead if they are made with lead-containing brass parts. Replacing lead service lines and pipes can dislodge lead that gets caught in tap aerators. Routinely flushing lines whenever water hasn't been used for six hours or more and routinely cleaning aerators after plumbing work will reduce lead exposure.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THIS PROBLEM?

One measure of water system performance is the percent of community systems that meet State standards. The graph on the facing page indicates that several systems have improved over the past five years.

The best source of information about the quality of water provided by your public water system is the *Consumer Confidence Report*. These reports are available online at <http://yosemite.epa.gov/ogwdw/ccr.nsf/Rhode+Island>. To date, there is no reliable way to estimate the quality of private well water across the state.

TREND IN COMMUNITY WATER SYSTEMS MEETING RHODE ISLAND DRINKING WATER STANDARDS



Source: United States Environmental Protection Agency Safe Drinking Water Information System

WHAT CAN INDIVIDUALS, FAMILIES, PROPERTY OWNERS, AND MAINTENANCE WORKERS DO TO ADDRESS DRINKING WATER?

Homeowners and landlords can help to ensure safe drinking water through their attention and diligence. All consumers should be knowledgeable about areas where bacteria can proliferate, how inadvertent connections between faucets, pipes, and storage systems can occur, and that good maintenance can reduce risks whether the supply is public or private. Consumers and maintenance workers can reduce lead and other plumbing-related risks through the following strategies:

- If the tap has not been used for more than six hours, let the water run for one minute before using it for cooking or drinking.

- Always use water from the cold water tap for drinking and cooking.
- Clean faucet aerators every month.
- Use a kit (about \$25 from State-certified labs) to test your tap water for lead.
- Consider an in-line filtration unit.

For private well owners:

- Keep the area around your wellhead free of potential sources of contamination, like pets' waste, fuels, or household chemicals.
- Regularly check for a missing cap, cracks and corrosion, and tight surface seals.
- If you have problems, ask a Rhode Island Department of Environmental Management registered well driller to check your well construction and maintenance records. Keep those records current.

INFORMATION AND USEFUL CONTACTS

Rhode Island Office of Drinking Water: www.health.ri.gov/environment/dwq

United States Environmental Protection Agency Safewater: www.epa.gov/safewater

The University of Rhode Island "Home A Syst", a nationally recognized program serving the state's citizens who want to know more about the safety of private drinking water wells: www.uri.edu/ce/wq/has/Private%20Wells/private.htm

FORECLOSURE

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND FORECLOSURE?

Foreclosures threaten the stability of a community and the health of its housing. Properties that are unoccupied are often damaged when doors and windows are broken and copper, boilers, and fixtures are removed. Neighborhood safety hazards resulting from this type of damage include deteriorating lead paint conditions, distressed exteriors that allow for the introduction of water and pests, yards filled with garbage and broken glass, and exposure to additional damage from vandalism.

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY FORECLOSURE?

Homes with pending foreclosures also pose risks to their occupants. Maintenance and repairs are deferred when a property owner is unable or unwilling to keep up the property. Utilities may be shut off, leaving households without heat and water. These conditions may not only affect the owner, but also the tenants in rental housing.

WHAT IS BEING DONE TO ADDRESS FORECLOSURE?

The United States Department of Housing and Community Development Neighborhood Stabilization Program (NSP) is addressing the foreclosure crisis and returning properties to use. To implement the NSP, homes are required to comply with radon testing, state and federal regulations on lead-based paint hazards, and state fire codes. To reduce the number of vacant properties and to keep people in their homes, federal programs are being implemented.



HOMELESSNESS

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND HOMELESSNESS?

Living in substandard homes contributes to poor health, which deteriorates even more when a person is homeless and moving from shelter to shelter or living on the street. Lack of consistent or available healthcare, poor nutrition, and crowded conditions all contribute to a high rate of poor health as reported by homeless housing service providers and those who are homeless.

Homeless youth are at risk for a number of health problems due to life on the streets, including sexually transmitted disease, HIV/AIDS, and untreated health and mental health conditions (2009 Rhode Island Kids Count Factbook). The homeless experience a higher percentage of chronic health problems than the general population. The Rhode Island Emergency Shelter Annual Report for 2006-2007 indicates that 38.4% of homeless people have medical problems.

Rhode Island KIDS COUNT reports that homeless children are “more likely to experience illnesses such as stomach problems, ear infections and asthma” (2009 Rhode Island Kids Count Factbook). These health concerns, and living in crowded conditions, indicate housing problems before entry into a shelter.

WHAT CAN BE DONE TO ADDRESS HOMELESSNESS?

Housing First Rhode Island, a supportive housing program, indicated in their 2008 evaluation that 46% of those who had been chronically homeless reported, in a baseline interview about their experiences during the year prior to entering the program, that their health was poor or very poor. At a follow-up interview one year after entering an apartment, this number was reduced to 21%. Hospital overnights during the preceding year for the same population were reduced from 534 to 137.

HEALTH AMONG RHODE ISLANDERS MOVING FROM HOMELESSNESS TO HOUSING

	YEAR PRIOR TO ENTERING APARTMENT (n = 48)	YEAR AFTER ENTERING APARTMENT (n = 48)
Hospital overnights	534	137
Mental health overnights	73	58
Alcohol/drug overnights	538	75
Emergency room visits	177	81
Jail/prison overnights	919	190
Emergency shelter	9,600	384

Source: Housing First Rhode Island, evaluation conducted December 2008

This data from Housing First Rhode Island demonstrates that the health of individuals is improved when people move from homelessness into housing.

Housing conditions can further improve the health of people who have recently moved from homelessness into housing through the following strategies:

- Install, maintain, and consistently use safety devices (e.g., smoke alarms; carbon monoxide alarms; stair gates in homes with young children; grab bars in bathrooms; adequate outside lighting; locks on cabinets used to store medicines, cleaning solutions, automotive supplies, firearms and ammunition, pool chemicals, and pesticides; four-sided

isolation fencing with self-closing, self-latching doors around pools).

- Consider integrated pest management, including natural, biological, and chemical methods, with the least impact on health and the environment.
- Complete a home fall-prevention checklist for homes with older adults (www.cdc.gov/ncipc/pub-res/toolkit/ChecklistforSafety.htm).
- Prepare and practice an emergency fire escape plan (www.firesafety.gov/citizens/escape).
- Prepare shelter-in-place and evacuation plans for weather and other disaster situations (www.redcross.org/preparedness/cdc_english/home.asp).



LEAD

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND LEAD?

The most common source of lead poisoning in young children is lead-based paint from older homes. Lead-based paint was banned from use in the United States in 1978. An estimated 80% of Rhode Island homes were built before this time and are likely to contain lead-based paint.

Lead becomes a hazard when lead paint is chipping or peeling, creating lead dust. Lead dust is commonly created by friction, such as when windows and doors are opened and closed. Young children who play on the floor and put their toys and their hands in their mouths can ingest this lead dust and become lead poisoned.

Lead is also present in soil and dirt and in water from lead pipes. In addition, lead may be found in a number of household products including pottery, crystal, ceramic dishes, and some folk medicines.

WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

Lead poisoning continues to be a public health problem in Rhode Island. While we continue to see a decline in the number of children with an elevated blood lead level (greater than or equal to 10 µg/dL) for the first time in their lives, there were still 324 children younger than six years of age in 2009 who

More than 70% of the state's housing has potential lead hazards that can poison the children of Rhode Island.

were affected by this preventable disease.

New cases of lead poisoning continue to

be concentrated in the core cities. In 2009, the incidence of lead poisoning in the core cities (Central Falls, Newport, Pawtucket, Providence, West Warwick, and Woonsocket) was 1.8% compared to 0.6% in the rest of the state. Incidence is the proportion of new cases of a disease that develop during a specified period of time among the population at risk for developing the disease.

An elevated blood lead level may have a negative impact on children's learning and school performance. Our data shows that of the 12,384 children who will enter kindergarten in 2011, 2.4% (302) have had an elevated blood lead level at one time.

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY LEAD EXPOSURE?

The most common source of lead poisoning is cracking or chipping lead-based paint in homes built before 1978. Issues like the economy, foreclosures, the real estate market, cost of renovations, and housing laws can affect a property owner's ability to maintain these homes.

In addition, it is important to consider that although lead-based paint is the most common source of lead poisoning, it is not a hazard if the paint is intact. It becomes a hazard only when the

paint is chipping and peeling or is disturbed through renovations or repairs. As a result, proper maintenance and upkeep of the property is important in keeping the premises lead-safe.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THIS PROBLEM?

The age of the housing and the socioeconomic status of the neighborhood are good indicators of the magnitude of the problem. The CDC has estimated that 83% of houses built before 1978 still have potential lead hazards that could poison children living inside of them.² Older housing is more likely to have lead-based paint, and poor areas are likely to have a greater percentage of housing in need of repair. The Housing Resources Commission estimates that there are 300,000 houses (70% of the state's housing) in Rhode Island that were built before 1978. Of those houses, 30,000 are high risk and in desperate need of repair. The remaining 270,000 are in need of good maintenance practices. This data suggest that more than 70% of the state's housing has potential lead hazards that can poison the children of Rhode Island.



WHAT CAN FAMILIES, PROPERTY OWNERS, AND MAINTENANCE WORKERS DO TO ADDRESS LEAD?

For families

- Make sure any child younger than six years of age is tested for lead and that you know what to do about their blood lead levels.
- Clean regularly with a wet rag or mop to decrease the amount of lead dust in the home.
- Use a vacuum with a high efficiency particulate air (HEPA) filter to trap lead dust.
- Block areas of chipping or peeling paint with duct tape or furniture.
- Discourage children from playing near or on the windowsills.
- Notify your landlord of deteriorating paint conditions.
- As of May 2010, a licensed Lead Hazard Control Firm is required when renovations will disturb more than 6 square feet of interior paint per room or 20 square feet of exterior paint. The firm should give the owner and any tenants the *Renovate Right* booklet before beginning work on your home. For a list of licensed Lead Hazard Control Firms, visit www.health.ri.gov/leadpoisoning/about/licenseverification.

For property owners

- Take the three-hour lead hazard awareness class to learn how to identify lead hazards on your property.
- Visually inspect your property to identify lead hazards.
- Use lead-safe work practices to do any repairs.
- If renovations will disturb more than 6 square

² Centers for Disease Control and Prevention. *Screening Young Children for Lead Poisoning*, November 1997.

feet of interior paint per room or 20 square feet of exterior paint, hire a licensed Lead Hazard Control Firm to do the work or take an eight-hour Lead-Safe Remodeler/Renovator class and get licensed through the Department of Health.

- If you rent your property to other occupants, comply with the federal lead hazard disclosure requirements and provide incoming tenants with a copy of the booklet titled *Protect Your Family From Lead in Your Home*.
- Comply with the Renovation, Repair, and Painting Rule by distributing the brochure titled *Renovate Right* to occupants before beginning renovations.

For maintenance workers

- Become affiliated with a Lead Hazard Control Firm.
- Use lead-safe work practices to do any repairs.
- Use a vacuum with a high efficiency particulate air (HEPA) filter to trap lead dust.
- Consider taking the eight-hour Lead-Safe Remodeler/Renovator course to obtain a license from the Department of Health.
- Comply with the Renovation, Repair, and Painting Rule by distributing the *Renovate Right* booklet to owners and occupants before beginning renovations.



LEAD AND EDUCATION

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND LEAD?

In most communities, where a family lives determines where their children will go to school. Recent evidence suggests that where a family lives may also impact their child's reading readiness when he or she enters kindergarten. After adjusting for sex, race, age, child language, and free/reduced lunch status, data collected in Providence found that children whose blood lead levels measured 5 to 9 $\mu\text{g}/\text{dL}$ and $\geq 10 \mu\text{g}/\text{dL}$ were 1.43 and 2.49 times more likely, respectively, to score below national benchmark standards for reading readiness than their same-aged peers whose blood lead levels were lower than 5 $\mu\text{g}/\text{dL}$. Given the preponderance of housing built before 1950 in Rhode Island, particularly in urban areas, many children may be exposed to blood lead levels that fall below the public health threshold for medical intervention, 15 $\mu\text{g}/\text{dL}$.



WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

The health impacts of lead exposure are well documented. Elevated blood lead levels among young children can result in irreversible cognitive, neurological, and other developmental damage. In rare cases, acute poisoning can result in serious illness or even death. The recent data on

kindergarten reading scores and blood lead levels suggest that even low levels of lead can have a significant impact on reading readiness for children entering kindergarten. Children who enter kindergarten not ready to read are more likely to complete kindergarten behind their peers with blood lead levels below 5 $\mu\text{g}/\text{dL}$.

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY LEAD EXPOSURE?

Older homes with lead-painted surfaces, moisture problems, or water leaks can all increase exposure to lead hazards. Interior house dust can become contaminated with lead due to the deterioration or disturbance of lead-based paint and from contaminated soil being tracked or blown into the home. Hazards are more common in older urban neighborhoods, in older homes with limited

maintenance, and in homes undergoing renovation, remodeling, repainting, demolition, or where painted surfaces are otherwise disturbed.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THIS PROBLEM?

From 1999 to 2006, the percent of Rhode Island children with elevated blood lead levels has dropped from 6.9% to 2.4%. Despite this progress, our state's rate of children with elevated blood lead levels still surpasses the national average and is second highest among 34 comparable states. Furthermore, the percentage of children with elevated blood lead levels is higher among children whose families are poor. For example, in 2010, 7.4% of Providence kindergarteners and 6% of Central Falls kindergarteners had a confirmed blood lead level of ≥ 10 $\mu\text{g}/\text{dL}$. In all, the 3.1% of all children entering kindergarten in 2010 had blood lead levels of ≥ 10 $\mu\text{g}/\text{dL}$, with the rate jumping to 5.2% in the core cities.

WHAT CAN POLICY MAKERS, FAMILIES, PROPERTY OWNERS, AND MAINTENANCE WORKERS DO TO ADDRESS LEAD?

- Revise the eligibility criteria for Early Intervention to allow for automatic enrollment of children younger than age three who have blood lead levels ≥ 5 $\mu\text{g}/\text{dL}$.
- Encourage school nurses to consistently use KIDSNET to identify children whose blood lead levels place them at greater risk for lower reading scores and to provide those children with increased support and instruction.
- Test houses occupied by children younger than six years old for lead and control or eliminate lead hazards.
- Ensure that providers working with children enrolled in Early Intervention and other home visiting programs are aware of the effects of lead on early learning, development, and school readiness.
- Support high quality early childhood development programs that are believed to positively influence children with elevated blood lead levels.
- Ensure that all children younger than six years old are tested every year with a blood lead test and followed-up with if the blood lead level is elevated.
- Increase enforcement of minimum housing standards. The existing high housing supply affords the opportunity to become more stringent with regulations and enforcement and possibly remove chronically problematic units from the housing supply.
- Encourage families to minimize exposure to dust and peeling or chipping paint by keeping floors and window surfaces clean, using mats at entrances to the home, removing shoes when coming indoors, and washing hands regularly.
- Maintain older housing by repairing plumbing leaks quickly, making sure the roof and gutter system are in good condition, and controlling other sources of moisture in your home. Use lead-safe work practices for repainting areas that are peeling or chipping.
- Use lead-safe work practices when disturbing paint in houses built before 1978. This includes repainting, remodeling, and renovation work. Contact the HEALTH Information Line at 401-222-5960 for more information.

OBESITY

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND OBESITY?

Neighborhood quality, which includes housing, has been shown to be a significant determinant of health. Perceived safety, traffic hazards, and poor access to fresh and healthy foods are neighborhood characteristics that are closely related to overweight and obesity risk and prevalence. As a result of the strong relationship between neighborhood-level factors and health, obesity prevention has become more focused on the built environment as a means of prevention. The built environment refers to man-made surroundings that provide opportunities or act as barriers to human activity, such as housing developments, parks, transportation systems, land-use decisions, and food establishments. Consequently, the health impact must be considered in the planning, construction, and management of housing and neighborhoods to create an environment where people can eat smart and move more.

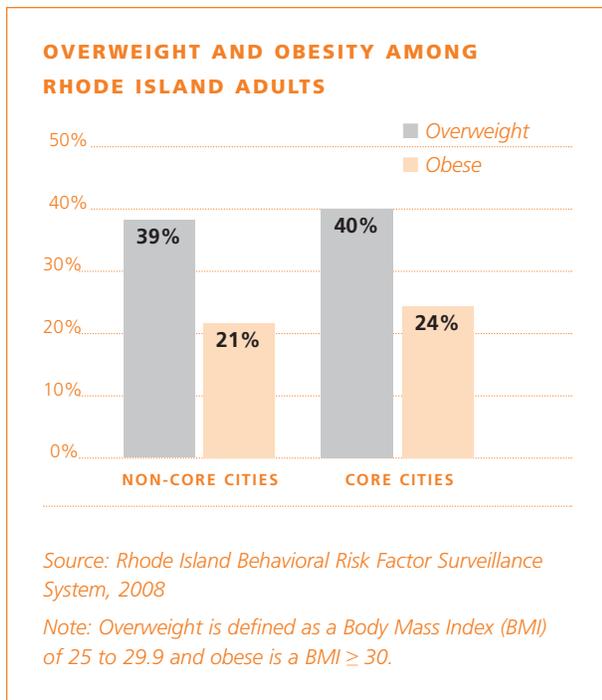
WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

A growing body of research has shown that the environment significantly influences individual choices. The availability of affordable and healthy foods and high-energy dense foods, the oversaturation of fast-food establishments, and the dependence on corner stores to purchase foods have been closely linked to obesity rates. Similarly, research in transportation has shown that neighborhood environmental variables influence whether people walk, bike, or drive to their

destinations. Neighborhoods must be highly walkable, mixed-use, dense, and safe in order to facilitate active living or promote other means of transportation besides driving. Neighborhoods should also contain elements that promote recreation, such as safe streets and public open spaces, as it has been shown that people who live in neighborhoods with safe opportunities for walking and recreation are more physically active. Based upon the growing body of evidence, it is important to create environments that integrate physical activity and healthy eating into daily routines in order to make healthy choices easier choices.

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY OBESITY?

The quality of neighborhoods has a significant relationship with overweight and obesity, and housing contributes to these rising trends. Emphasis is increasingly placed on the Ecological Model, which highlights the social, political, and physical environments that influence human behavior. In order to influence and sustain behavior change, both the individual and outside forces that affect the individual must be targeted. The Ecological Model acknowledges that while individuals have choices, we must also recognize and address the environmental influences on individual decisions. The goal is to create an environment that provides the infrastructure and social support to enable people to develop healthier lifestyles.



WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THE PROBLEM?

In Rhode Island, data has shown that there is a slight difference in weight for individuals residing in core and non-core cities. Local data indicate that there were more overweight (40%) and obese (24%) individuals residing in core cities compared to overweight (39%) and obese (21%) individuals in non-core cities. While a direct relationship between residence and obesity risk has not been established, urban core areas are often particularly challenged with limited access to fresh fruits and vegetables, safe areas for play, and opportunities for community recreation.^{3,4} A recent study utilized data from the National Survey of Children’s Health to examine the impact of neighborhood conditions

and the built environment on overweight and obesity prevalence among children in the United States. Children residing in unsafe neighborhoods or neighborhoods with a concentration of poor housing and the presence of garbage and litter had about a 30% to 60% higher chance of becoming obese or overweight than children living in better neighborhoods.⁵ The neighborhood environment must improve quality and access to healthy options in order to facilitate healthy behavior change.

WHAT CAN POLICY MAKERS, MUNICIPALITIES, AND COMMUNITIES DO TO ADDRESS OBESITY?

Decisions about zoning, transportation, and community design should be made with the health of the community in mind. Policy makers, municipalities, and communities can:

- Mobilize community members and key stakeholders to advocate for community change.
- Assess the food, activity, and housing environments to identify strengths and gaps.
- Strengthen city and town comprehensive plans to ensure that healthy eating and active living are considered.
- Support bicycling and walking, locating schools closer to residential areas to encourage non-motorized travel to and from school, zoning to allow mixed-use areas that combine residential with commercial and institutional uses, improving access to public transportation, and improving personal and traffic safety in areas where persons are or could be physically active.

³ Moore LV, Roux AV, Nettleton JA, Jacobs DR. Association of the Local Food Environment with Diet Quality—A Comparison of Assessments based on Surveys and Geographic Information Systems. *American Journal of Epidemiology* 2008; 167(8):917-924.

⁴ Larson NI, Story MI, Nelson MC. Neighborhood environments: disparities to access in healthy foods in the U.S. *American Journal of Preventive Medicine* 2009; 36(1):74-81.

⁵ Singh GK, Siahpush M, Kogan MD. Neighborhoods socioeconomic conditions, built environments, and childhood obesity. *Health Affairs* 2010; 29(3):503-512.

RADON

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND RADON?

Radon is an invisible, odorless, tasteless radioactive gas that can cause lung cancer. It comes from the natural decay of uranium that is found in soil. The gas seeps into homes and buildings through cracks and openings in the basement floor or building foundation. Radon gas can also dissolve in ground water, diffusing into the home as well water is used. High radon levels inside the home increase an occupant's risk for lung cancer.

WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

Health risks of radon exposure in the home stem from its breakdown into “radon daughters” which emit high-energy alpha particles. These progeny enter the lungs, attach themselves, and eventually lead to lung cancer. According to the EPA, this exposure in homes is believed to contribute to 21,000 lung cancer deaths in the United States each year. Prolonged exposure to high levels of indoor radon gas is second only to cigarette smoking as a cause of lung cancer. Smokers who are exposed to high levels of radon in the home are at an even greater risk of developing lung cancer. EPA has identified radon levels at or greater than four picocuries per liter as levels at which remedial action should take place.

Prolonged exposure to high levels of indoor radon gas is second only to cigarette smoking as a cause of lung cancer.

HOW CAN HOUSING PROBLEMS CAUSE OR MAGNIFY RADON EXPOSURE?

The condition of a home's foundation and basement floor can have a significant impact on the occupants' exposure. Homes are often constructed with loose fill under a basement slab and between the walls and the exterior ground. This fill is more permeable than the original ground. Houses typically draw less than 1% of their indoor air from the soil. However, houses with low indoor air pressures, poorly sealed foundations, and several entry points for soil air may draw up to 20% of their indoor air from soil, significantly increasing the occupants' exposure. Inadequate ventilation in the home may also contribute to increased radon exposure and further reduce indoor air quality.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THE PROBLEM?

The EPA data indicates that one in 15 homes in the United States is found to contain radon at or above the EPA's action level of four picocuries per liter. In Rhode Island, approximately one in four homes contain radon at or above this action level.⁶ Mapping of test results in Rhode Island in 2008 revealed the highest percentage of elevated radon levels were in Washington and Kent Counties, as indicated in the figure on the facing page. In Exeter and Richmond, more than 50% of tested homes exceeded the EPA action level.

⁶ Rhode Island Department of Health Radon Database.

WHAT CAN INDIVIDUALS, FAMILIES, PROPERTY OWNERS, AND MAINTENANCE WORKERS DO TO ADDRESS RADON?

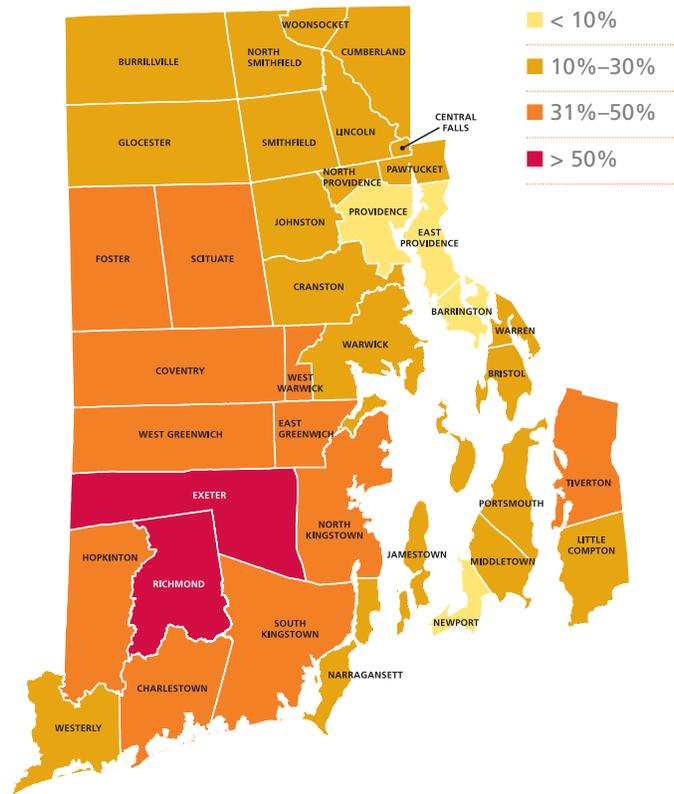
- Test houses for radon every three to five years. Radon in the home can be measured by the occupant or by a professional. Radon levels vary from day to day and season to season. Short-term tests (2 to 90 days) are best if quick results are needed, but long-term tests (more than three months) yield better information on average, year-round exposure.

The simplest devices are passive, require no electricity, and include a charcoal canister, charcoal liquid scintillation device, or alpha track detector. Measurement devices are typically placed in the lowest occupied level of the home.

- Install a mitigation system if the test result is four picocuries or higher.
- Consider radon-resistant new construction techniques when adding to or building a house.
- Become educated on the risks of radon exposure.

RHODE ISLAND HOMES ≥ 4.0 pCi/L RADON

TOWN	PERCENT
Barrington	10
Bristol	20
Burrillville	26
Central Falls	11
Charlestown	50
Coventry	32
Cranston	17
Cumberland	23
East Greenwich	47
East Providence	10
Exeter	56
Foster	35
Glocester	22
Hopkinton	48
Jamestown	26
Johnston	25
Lincoln	25
Little Compton	25
Middletown	18
Narragansett	25
New Shoreham	5
Newport	8
North Kingstown	36
North Providence	12
North Smithfield	25
Pawtucket	17
Portsmouth	28
Providence	9
Richmond	61
Scituate	35
Smithfield	26
South Kingstown	43
Tiverton	32
Warren	15
Warwick	13
West Greenwich	48
West Warwick	33
Westerly	24
Woonsocket	17



Source: Rhode Island Department of Health Radon Database, December 2008
 Note: Data represents 43,463 houses tested for radon.

REFUGEE HEALTH

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND REFUGEE HEALTH?

Rhode Island resettles between 150 and 200 refugees yearly who have fled from their countries due to war or the threat of persecution. In 2007, the number of refugees world-wide rose to 25.1 million. That same year, 173 refugees were resettled in Rhode Island. Those refugees came primarily from Africa and Southeast Asia.

WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

The resettlement of refugees is challenging. To address their healthcare needs, refugees require easy access to healthcare providers who are experts at treating diseases endemic to their home countries. Healthcare provider offices located on the bus route to Hasbro and Rhode Island Hospitals are usually the most accessible. To address their social and cultural needs, newly resettled refugees need to live near others who speak their languages or share in their customs. Their housing needs to be sanitary, safe, and conducive to good health. Prior to coming to the United States, refugees families have often spent years in camps and suffer a variety of health problems that make them more vulnerable to health threats like lead and other hazards.

Housing for newly settled refugees needs to be sanitary, safe, and conducive to good health.

WHAT DATA ARE AVAILABLE TO SHOW THE MAGNITUDE OF THIS PROBLEM?

As part of their resettlement to the United States, refugees receive healthcare. Routine pediatric care is provided to refugee children, including screening for lead exposure. Because of the concerns that even older refugee children may be vulnerable to lead exposure, either because of previous exposure in their home countries or recent exposure in Rhode Island, screening is not stopped at age six but continues until the age of 18.

An analysis of lead screening data for refugee families in Rhode Island, most of whom are resettled in Providence, shows that refugee children have lead poisoning rates more than four times higher than average levels in Providence. Between 2005 and 2008, prevalence rates for refugee children declined from 39.4% to 14.1% compared to rates for other Providence children, which declined from 8.9% to 3.8%. These data point to the failure to resettle refugee families in homes that are safe from lead hazards.

In contrast to young refugee children, refugee children older than six years of age, like older children born in the United States, are at lower risk for lead poisoning. Of 24 refugee children between the ages of 7 and 17 years tested in 2008, none had lead levels higher than 10 µg/dL.



WHAT CAN PROPERTY OWNERS, SERVICE PROVIDERS, AND MAINTENANCE WORKERS DO TO ADDRESS REFUGEE HEALTH?

Resettlement agencies face extraordinary financial and time pressures in finding housing for refugee families. Resettlement stipends are not adequate to pay prevailing rents and advance notice of the arrival of a new family is often only one week or less. The need to locate refugee families near service providers further narrows the pool of available housing. Partnerships between resettlement agencies and advocates for refugee health are needed to identify more resources for finding refugees safe and affordable housing. Landlords need to obey the law and obtain a

Certificate of Conformance to demonstrate to the refugee families that become their tenants that their units are safe from lead hazards.

Identifying safe and affordable housing can be simplified by the expansion of HomeLocatorRI.net, a web-based resource that provides information about available rental properties that have certain safe characteristics, such as having a Certificate of Conformance. Until the number of properties listed on HomeLocatorRI.net expands, this tool will have limited utility for refugee resettlement. By encouraging landlords to list their properties on HomeLocatorRI.net, resettlement agencies will have an easier time locating safe and affordable housing for Rhode Island's most vulnerable families.

SMART GROWTH

WHAT ARE THE CONNECTIONS BETWEEN HOUSING AND SMART GROWTH?

Where housing is located within a community and what types of housing are available have a major impact on individual, family, and public health. Is housing located close enough to schools, stores, and community facilities so that people can enjoy the health benefits of conducting daily errands on foot or bike? Do children and adults living in homes that do not have yards still have easy access to playgrounds and parks? Do senior citizens have housing options that enable them to walk or use public transportation to continue to participate in community life? Does the community offer a range of rental and purchase prices so that Rhode Islanders at all levels of the economic spectrum can afford safe and healthy housing?

Smart growth, a concept at the heart of Rhode Island's state policies concerning land use, is based on the recognition that well-designed communities

Smart growth is based on the recognition that well-designed communities provide health, social, economic, and environmental benefits for all.



provide health, social, economic, and environmental benefits for all. It calls for a pattern of development that locates the majority of a community's housing and community facilities in compact, mixed-use, walkable centers, and preserves farms, forests, and open space outside of those centers. In general, smart growth encourages communities to invest time, attention, and resources into restoring vitality to existing cities and town centers through rehabilitation of existing buildings and infill

construction. It encourages municipalities that don't have existing centers to develop community plans that call for one or more mixed-use centers that combine housing, commercial, and retail uses and are transit- and pedestrian-oriented. Whether a community is revitalizing an existing center or planning a new center, smart growth emphasizes the importance of good design, sustainable development, and the incorporation of parks and green space.

WHAT IS THE EVIDENCE FOR THESE CONNECTIONS?

Many of our current environmental challenges—air and water pollution, global warming, habitat fragmentation and conversion—are due in part to the way we have built our neighborhoods, communities, and metropolitan areas during the past half-century. Smart growth promotes a community framework that addresses these environmental concerns.

Smart growth protects public health and environmental quality, conserves energy, and improves the quality of life in communities in a number of ways:

- Smart growth promotes new transportation choices. Mixed-use, compact development, combined with design elements such as bike lanes and pedestrian-friendly features, encourages people to walk, bike, and use public transportation. This conserves energy, reduces air pollution, and engages residents and workers in a more active, healthy lifestyle.
- Smart growth promotes housing options for diverse lifestyles and socioeconomic levels.
- Smart growth promotes resource-efficient building design, which reduces health threats from air and water pollution and indoor air contaminants.
- Smart growth promotes conservation of forests and farmlands in our outlying areas and emphasizes the importance of creating parks and greenways in our city and town centers and taking advantage of natural amenities including our shorelines and rivers.

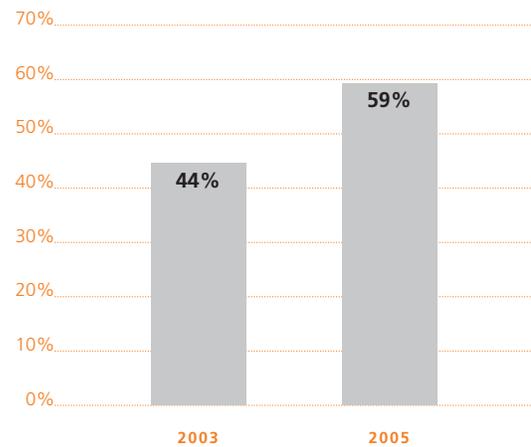
HOW CAN SMART GROWTH REDUCE OR ELIMINATE HOUSING PROBLEMS?

Rhode Island's abundance of older housing and neighborhoods present both an opportunity and a challenge. Our historic city and town centers exemplify the compact, mixed-use neighborhoods

Top Five Expectations About Traditionally-Designed Communities

1. Allow kids to walk to school
2. Be safe for kids to play in neighborhood
3. Enable people to walk/bike to public transit
4. Enable people to walk/bike to shopping
5. Enable older adults to live independently

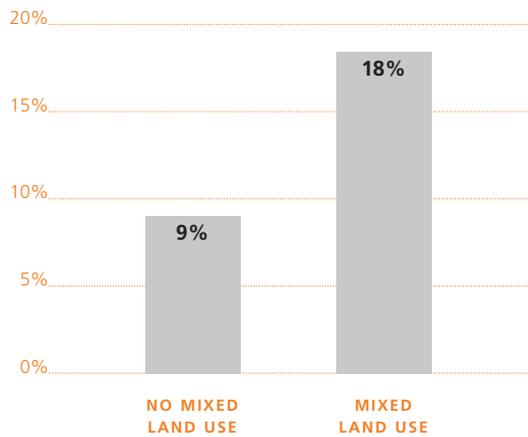
SUPPORT FOR TRADITIONALLY-DESIGNED COMMUNITIES



Source: Handy S, Sallis F, Weber D, Maibachd E, Hollander M. Is Support for Traditionally Designed Communities Growing? Evidence From Two National Surveys. *Journal of the American Planning Association* 2008; 74(2):209-221.

that smart growth promotes. When carefully rehabilitated, their compact siting, traditional details, and historic materials provide a character that greatly contributes to community livability. When allowed to sit in disrepair, they are a blight on residential neighborhoods and a hazard to people seeking housing in those neighborhoods. For this reason, smart growth places a high priority on providing rehabilitation incentives and other assistance to developers and individual property owners.

WALKING TRIP FREQUENCY AMONG URBAN YOUTH



Source: Frank L, Kerr J, Chapman J, Sallis J. Urban Form Relationships With Walk Trip Frequency and Distance Among Youth. *American Journal of Health Promotion* 2007; 21(4 Supplement):305.

Note: Data represents Atlanta youth ages 5 to 18 (n = 3,161) who had a walking trip over a two-day period.

WHAT DATA/INDICATORS ARE AVAILABLE TO SHOW THE MAGNITUDE OF THIS PROBLEM?

As illustrated in the graph above, a review of original studies published in 2005 to 2006 found that walking for transportation is most strongly related to living in a neighborhood with high residential density, mixed land use, and short distances to destinations.

WHAT CAN POLICY MAKERS, MUNICIPALITIES, AND COMMUNITIES DO TO CONTRIBUTE TO SMART GROWTH?

Successful communities tend to share a common vision—a vision of where they want to go and of what they value in their communities—and their plans for development reflect this vision. Communities can promote healthy housing and smart growth in the following ways:

- Advocate for a variety of *transportation choices*, which can include places for people to walk, ride bicycles, ride the bus, ride light rail, take the train, or carpool.
- Offer *housing choices* where people can live and create opportunities for the variety of people who need them—families, singles, seniors, and people with special needs.
- Take advantage of *compact development*, which involves creating environments that use space in an efficient but more aesthetic manner and can encourage more walking, biking, and public transit use.
- Use *existing assets* to develop communities, vacant land, or underutilized land and make better use of public infrastructure, including roads.
- Building homes together with small businesses or even light industry is called “*mixed-use development*,” and it has proven to create active, vital neighborhoods.
- Preserve open space, farmland, and natural beauty through *natural resources conservation*. Our quality of life is better when we have clean air to breathe and water to drink and when we can experience the outdoors in parks and greenbelts or in other natural places.
- Use *quality design* to make attractive communities, which influences how much people like to walk or bike and contributes to a sense of pride and ownership.
- Encourage community and *stakeholder collaboration* so that the people who live and work in a community define their own needs and solutions.
- Foster attractive communities with a strong sense of place that reflects the values and cultures of the people who reside in those communities.
- Make development decisions predictable, fair, and cost-effective by embracing the private sector.



ANSWERING THE CALL TO ACTION

Rhode Island is making great strides to promote healthy homes by implementing innovative ideas that can keep children and families living in healthy environments. Collecting data, formulating indicators, mapping environmental risks to identify healthy and unhealthy neighborhoods, and involving key partners in statewide efforts are all examples of the consistent and important participation of a wide array of agencies in the private and public sectors.

To ensure a healthier environment for the future, the Surgeon General's *Call to Action to Promote Healthy Homes* outlines four main goals:

1. Ensure Healthy, Safe, Affordable, and Accessible Homes
2. Increase Public Awareness and Promote Health Literacy
3. Conduct Healthy Homes Research
4. Translate Research into Practice and Policy

These goals call on people from many walks of life to join in a discussion about healthy homes; to make informed, shared, and compassionate decisions; and to develop imaginative and realistic solutions that will help to ensure that a safe, healthy, affordable, and accessible home is available to every person in the United States.

Rhode Island has committed to making healthy housing a reality, and is answering the *Call to Action* through a number of innovative programs. Four case studies of successful efforts to improve housing conditions for individuals and families are presented here to illustrate what a few dedicated

individuals and organizations can achieve through their vision and creativity.

GOAL 1: ENSURE HEALTHY, SAFE, AFFORDABLE, AND ACCESSIBLE HOMES

NeighborWorks

Blackstone River Valley

NeighborWorks Blackstone River Valley (NWBRV) strives to create affordable homes for healthy living by working to revitalize neighborhoods across Northern Rhode Island, one home at a time.

In the past 15 years, NWBRV has developed more than 230 units of affordable living space, including new construction of single and multi-family homes and renovation of rental units for the elderly and families. These affordable units are sold or rented to accommodate different needs and income levels.

NWBRV creates environmentally-friendly units that are safe for families, in part by striving to achieve a lead-free status. In order to promote smart growth, NWBRV works to select locations within walking distance of community services, commerce, and amenities. It incorporates "green" building materials and methods into its building and/or rehabilitation programs whenever feasible.

NWBRV has used innovative funding methods to bring vacant, historic properties back to life, and has creatively leveraged federal and state funding sources to develop land trusts that maintain long-term affordability for first-time buyers.



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Executive Director Joe Garlick believes that building affordable, healthy housing is the foundation of creating neighborhoods of opportunity. Since he joined NWBRV in 1994, he's been working to expand the organization's scope to include broader community-building efforts, including after school care for children, an Artist-In-Residence program, a partnership with the Woonsocket Area Career and Technical Center, and an annual youth-led Martin Luther King, Jr. Day celebration.

NWBRV has also created forums for community planning and a Regional Affordable Housing Coalition. They've even planted a community garden.



NEIGHBORWORKS BLACKSTONE RIVER VALLEY PROJECTS

NWBRV renovated 40 abandoned houses into 110 affordable apartments in Constitution Hill. The project transformed a formerly blighted neighborhood into a vibrant area with a community center, art center, garden and orchard, playground, and social service offices. NWBRV developed several different housing options, including homes for families and the elderly and permanent supportive housing.

NWBRV transformed an abandoned shopping center at Heritage Place into a mixed-use development with 43 affordable apartments, a community center, a regional Homeownership Center, and 16,500 square feet of commercial space.

In a conservation development project at Woodridge Estates, NWBRV creatively used a land trust to preserve affordability and set aside two-thirds of the site as conservation land. The project created a subdivision of 26 new homes for first-time buyers.

Four apartments were designed for home child care providers and a formerly abandoned historic school was transformed into a new child care center. The child care center is the first facility in the United States to use New Market Tax Credits in its financial structure. In efforts to meet the child care needs of the community, the child care project injected fresh thinking into the concept of affordable housing.

NWBRV formed a partnership with the Woonsocket Area Career and Technical Center where students are provided the site, materials, and coordination to build a house. Once completed, the house is sold to a low-income buyer. The program has produced homes for 12 families.

For more than six years, NWBRV has run an after school program for more than 125 children living in NWBRV apartments. NWBRV provides 25 class hours of teaching per week, quarterly tracking of student grades, and college application counseling for high school students. The program has increased academic achievement for all participating students.

To stimulate the local economy, NWBRV sponsors lead abatement certification trainings for contractors and then uses these local contractors to work on affordable housing projects.

NWBRV created an Artist-in-Residence program, in which an artist is given free housing in exchange for providing 20 hours of free arts instruction and mentoring per week. NWBRV also developed an arts center with more than 15 hours of weekly programming.

**GOAL 2: INCREASE PUBLIC AWARENESS
AND PROMOTE HEALTH LITERACY**

Environmental Justice

League of Rhode Island

Since November 2008, the Environmental Justice League of Rhode Island (EJLRI) has worked with Providence community residents to learn about healthy housing and to take steps to reduce exposure to household chemicals and other



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common housing safety hazards. Providence is Rhode Island's capital city, its largest environmental justice community, and EJLRI's primary focus area.

EJLRI's mission is to engage and activate low-income communities and communities of color, those who are most affected by environmental burdens, by developing leaders who take action to promote safe and healthy environments for all. In 2008, EJLRI was one of only 13 groups chosen to receive the EPA's Community Action for a Renewed Environment (CARE) grant. Through the CARE

ENVIRONMENTAL JUSTICE LEAGUE OF RHODE ISLAND PROJECTS

Green Teenz, a 10-week after school youth program in the spring of 2009, taught 10 Providence high school youth about toxics found in conventional household cleaners, asthma triggers, and indoor air quality. The youth created a five-minute video on ways families can use alternatives to conventional cleaners to clean their homes, including making their own cleaners or purchasing environmentally-friendly brands.

The Community Environmental College youth program, an eight-week collaboration with Brown University in the summer of 2009, covered a range of environmental issues for 10 Providence high school students, including non-toxic alternatives to conventional household cleaners.

EJLRI translated the West Michigan Environmental Action Council's *Green Cleaning for Your Healthy Home* recipe booklet into Spanish.

EJLRI hosted a lead-safe gardening workshop in August 2009 for 14 English-language learners at English for Action. The workshop used a brochure that instructs users how to build raised beds



and grow food in container gardens. The brochure was originally developed by the Childhood Lead Action Project and Southside Community Land Trust. EJLRI translated this brochure into Spanish and made it available at the workshop.

EJLRI collaborated with the Department of Health in the fall of 2009 to create an interactive Healthy Housing presentation, which has been delivered to more than 50 Providence adult residents through a partnership with Ready 2 Learn, Providence's child care provider network, and to more than 60 middle school youth through the Providence After School Alliance. The presentation focuses on the *Seven Steps to a Healthy Home* and teaches participants about alternatives to conventional household cleaners and pesticides.

EJLRI has led the first effort of its kind in the state to coordinate community-based home weatherization projects. EJLRI has weatherized three homes and trained more than 80 Providence area residents to perform basic home weatherization tasks since October 2009. The Department of Health has donated carbon monoxide detectors for each of the homes that are weatherized, and EJLRI provides the Department of Health's *Seven Steps to a Healthy Home* planners, bookmarks, and other informational materials to all event participants. EJLRI has 10 weatherization events planned between May and September 2010.

EJLRI trained 36 Providence residents to be recycling "block captains" to help implement the city's new recycling policy in the fall of 2009, and led a two-session follow-up training for 15 residents in March 2010 on recycling and proper methods to dispose of electronic waste and household hazardous waste.

Alliance, EJLRI has reached hundreds of Providence residents on various topics related to toxic burdens. EJLRI has brought together more than 40 stakeholders—community residents, local and state government staff, businesses, and representatives from various community organizations—who meet monthly to learn about and discuss environmental concerns. Over time, this alliance will develop a city-wide action plan to reduce toxic exposure for Providence residents.

In the first few months of the CARE Alliance, community participants identified healthy housing as a top concern, especially with respect to lead poisoning hazards and exposure to common household chemicals. Two CARE Alliance meetings have focused on issues related to healthy housing: one on indoor air quality and another on lead poisoning and housing code enforcement. In addition, in 2009, EJLRI initiated a number of workshops, youth programs, and other events that addressed the issue of healthy housing.



GOAL 3: CONDUCT HEALTHY HOMES RESEARCH

Brown University

Brown University understands the importance of the Surgeon General's goal to conduct healthy homes research.

Brown University, together with its Rhode Island partners, will enroll 1,000 Providence County children in research during the next four years as part of a larger national effort



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called the National Children's Study (NCS). The Study will follow 100,000 children from before birth until the age of 21 to examine the effects of environmental influences on their health and well-being.

The NCS defines "environment" broadly, taking a number of natural and man-made environmental, biological, genetic, and psychosocial factors into account. By studying children through different phases of growth and development, researchers will be better able to understand the role that factors, such as those directly related to healthy housing, have on health and disease. Findings from the NCS will be made available as the research progresses, making potential benefits known to the public as soon as possible.

As part of the NCS, environmental samples, including dust, air, and soil, will be collected to assess potential contaminants in a child's home and community. These data will be evaluated with respect to a broad spectrum of health outcomes ranging from autism and learning to measures of growth and well-being.

Ultimately, the NCS will be one of the richest research efforts for studying children's health and development and will form the basis of child health

guidance, interventions, and policy for generations to come.

By linking to a larger, national effort, Brown University and its research partners have the opportunity to develop a better understanding of the links between environmental factors and health and well-being.

This research complements Brown University's Healthy Communities study of 1,000 Rhode Island women and their newborns. Like the NCS, this study is assessing connections between environmental conditions and health outcomes. Blood lead data, as well as other housing and related data, are being evaluated with respect to health outcomes such as common childhood illness, emergency department visits, and healthcare utilization measures.

Brown University and its research partners agree with the Surgeon General that important advances in public health can be achieved with a more holistic understanding of how housing affects people's health. These two research projects will significantly contribute to that understanding.



GOAL 4: TRANSLATE RESEARCH INTO PRACTICE AND POLICY

Rhode Island Housing Resources Commission

The Rhode Island Housing Resources Commission (HRC) was created by the Rhode General Assembly in 1998



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“for the purposes of improving housing conditions, promoting housing affordability, engaging in community development activities, and assisting the urban, suburban, and rural communities of the state” (Rhode Island General Laws 42-128-1 (l)). In order to fulfill this mission, the HRC has utilized health-related data and research to determine priorities for action during the first decade of its work.

As required by the 1999 Lead Poisoning Prevention Act (23.24-6), the Department of Health collects all lead screening data, sets standards to conduct environmental inspections in the homes of significantly lead poisoned children, and enforces removal of lead hazards identified in these homes. While these activities resulted in better housing conditions for some homeowners and tenants who voluntarily carried out lead abatement work, a preventive, less costly, universal effort was required.

In 2002, the General Assembly passed the Lead Hazard Mitigation Act, which gave the HRC responsibility for mandating that property owners, at the time of sale or rental, certify that the home meets standards for mitigation. Since that time, more than 24,000 property owners and realtors have taken a three-hour course in lead hazard awareness and more than 25,000 properties have received Certificates of Conformance. As a result, elevated blood levels have decreased from 6% to 1.6% since implementation of the law in 2005.



Following the implementation of lead hazard mitigation, the HRC broadened its emphasis to include other healthy housing initiatives that impact housing quality. Influenced by the evolving knowledge of green building technology and energy efficiency, the HRC updated its policies and practices to promote healthy and sustainable development. For any programs or policies that utilize state funds, the following healthy housing priorities are in place:

- Sound project location, siting, and design
- Energy efficiency and green building
- Healthy and accessible living environments
- Access to transportation, jobs, and services
- Long-term affordability
- Promotion of smart growth
- Brownfield redevelopment

The HRC has required these priorities for both new construction and rehabilitation. As a result, nearly 2,000 additional affordable and healthy homes are available in Rhode Island. Each home is free of lead and other environmental hazards and improves the neighborhood and the larger community. Use of lead- and asbestos-certified contractors, removal standards, use of approved building materials and low volatile organic compound paints, removal of contaminated soil, and development where infrastructure includes public water and sewers are some of the universally accepted practices stemming from funding requirements.

Responding to Rhode Island's recent high rate of foreclosures, the HRC has combined federal and state housing funds to quickly return abandoned and blighted properties into housing opportunities for low- and moderate-income Rhode Islanders.

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