

Connecticut Department of Public Health

Healthy Homes Strategic Plan

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Connecticut Healthy Homes Team and the Inter-Organizational Working Groups

Facilitated by: Asthma Regional Council of New England, a Program of Health Resource in Action



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Summary

The Connecticut Department of Public Health's (CT DPH) vision is that *"Every Connecticut resident lives in a healthy and safe home environment."* Recognizing the need for a more integrated approach to improving home-based health outcomes, a Healthy Homes Team, representing seven single-hazard focused programs and indoor air quality was formed with the mission *"to develop statewide partnerships and implement comprehensive policies and coordinated program activities that foster a healthy and safe home environment, reduce housing related health disparities, and improve the public's health."*

What follows is an introduction about what a holistic healthy homes approach means, an overview of the state of housing and health-related data in Connecticut, an overview of the planning processes, a roadmap for statewide action to make homes healthier and safer, and listing of many early successes and key accomplishments to date. CT DPH has developed six core goals to achieve their mission. The goals address 1) public education; 2) optimization of policies and standardization of practices for prevention, assessment, and remediation of home-based hazards; 3) state-wide adoption of integrated healthy homes programs; 4) workforce development; 5) sustainable funding; and 6) impact assessment.

In addition to providing an internal roadmap, CT DPH has enlisted the support for implementing shared goals among an extensive list of external, multi-disciplinary partners who represent local and state governmental and non-governmental housing and health-related agencies and organizations. These partners include the Department of Economic and Community Development (DECD), the Connecticut Housing and Finance Authority, Department of Environmental Protection (DEP), the Chief State's Attorney's Office, Department of Consumer Protection, Department of Public Safety, CT Association of Directors of Health, CT Poison Control Center, CT Environmental Health Association, , University of Connecticut (UCONN) Cooperative Extension System: Healthy Environments for Children program, New England Lead Coordinating Committee, American Lung Association, and many more.

The Asthma Regional Council of New England (ARC), a Program of Health Resources in Action (HRiA), provided facilitation and technical assistance for the strategic planning process, including writing this report.

Introduction to Healthy Homes

Over the past several decades, an increasingly large body of scientific evidence has established the link between housing conditions and inhabitants' health. Hazards in the home environment cause or exacerbate a number of illnesses and injuries. For example, dust, mold, environmental tobacco smoke (ETS) and pests trigger asthma; radon and ETS cause lung cancer; household lead-based paint hazards are the major source of lead poisoning in children; carbon monoxide and chemicals in household products can lead to poisonings; and lack of safety railings or window guards can result in preventable falls.

Poor housing conditions can result in dangerous and costly diseases and injuries that are all preventable. Further, many of the home-based health hazards have related underlying causes and interventions. For instance, water infiltration that leads to excess moisture can contribute to mold growth, dust mites, chipping lead paint, rotting structures, and pest infestation. Simply

controlling moisture or preventing water entry can prevent a number of undesirable and costly conditions.

While there is no universally accepted definition of a healthy home, several agencies have developed their own definitions. According to one widely-used definition originally developed by HRiA's ARC, a healthy home is "dry, clean, pest-free, safe, contaminant-free, ventilated, and maintained." This definition has become the basis for the National Center for Healthy Homes' seven principles for a healthy home, and simplifies what can seem like a daunting list of hazards to address.

There is a growing list of evidenced-based healthy housing interventions that demonstrably improve public health. The National Center for Healthy Housing conducted a review of those evidenced-based housing interventions and classified their findings. More information on the health-related impacts of home-based hazards and their findings are provided in Appendix A.

A Healthy Homes Approach

Traditionally, the housing and public health fields have operated separately, with housing departments enforcing codes that address safety and the structural integrity of a house, and health officials addressing sanitation issues and health hazards, such as lead paint and radon gas. In addition, Fire Departments often inspect for presence of working smoke alarms and carbon monoxide detectors. More often than not, local code and health officials are responding to complaints and do not have the resources to promote prevention-oriented actions. This multiple agency, single-hazard, reactionary approach typifies how housing hazards are addressed.

As health and housing professionals learn more about the relationship between home environments and health, the need for addressing multiple hazards in a more coordinated and systemic way is becoming increasingly apparent. According to the US Centers for Disease Control and Prevention (CDC), "*A Healthy Homes approach is holistic and comprehensive and provides public health professionals, including environmental public health practitioners, public health nurses, and housing specialists, the requisite training and tools necessary to address the broad range of housing deficiencies and hazards associated with unhealthy and unsafe homes.*"

The rationale for adopting a healthy homes approach is simple: by using education and physical interventions to simultaneously address the shared, underlying causes of multiple home hazards, agencies and organizations will decrease costs, increase efficiency, and improve health outcomes.

On June 9, 2009 the U.S. Surgeon General released his *Call to Action to Promote Healthy Homes*. He emphasized a society-wide approach that will result in the greatest possible public health impact and reduction of disparities in the availability of healthy, safe, affordable, accessible, and environmentally friendly homes. He urged everyone... "*from parents and homebuilders to community leaders and policy makers to embrace the holistic approach to creating healthy homes.*" Health care providers and government entities were identified as critical leaders in this movement.

Recognizing the efficiencies of simultaneously addressing multiple housing-related health hazards, the federal Department of Housing and Urban Development (HUD) and the CDC have combined a number of single-issue public health programs and changed their funding

requirements promote coordinated “Healthy Homes” initiatives. At the state and local level, government and non-governmental agencies, including the State of Connecticut, are now creating interdisciplinary collaborations that bridge the fields of health, safety and housing.

Overview of Housing and Health-Related Impacts in Connecticut

As part of the strategic planning process, CT DPH compiled all of its housing conditions and housing-related health data. This baseline served to foster understanding about the breadth of health and safety issues that can be alleviated by addressing substandard housing. It may also serve as a baseline to compare progress as more standardized approaches to assessment, remediation and prevention are developed and implemented.

Population and Poverty

Connecticut is the fourth most densely populated state in the nation, with 88% of residents living in urban areas. Striking disparities exist across town lines, among racial and ethnic groups, and between urban and rural populations. Poverty rates increased from 7.3% of Connecticut residents in 2001 to 9.4% in 2009. In 2009, 12.1% of Connecticut’s children lived in families with incomes below the Federal Poverty Level. (US Census, American Community Survey)

Housing Stock

There are a total of 1,445,840 housing units in Connecticut. The housing stock is considerably older than the national average. (US Census, 2000)

- Approximately 69% of the housing stock is owner occupied and 31% is renter occupied. (US Census, American Community Survey, 2009)
- 48% of Connecticut’s housing stock was built prior to 1960 compared to 35% nationally.
- 35% of Connecticut’s housing stock was built before 1950. (US Census, 2000)

Public Health Programs and the Home Environment

There are several programs within the CT DPH that directly address some aspect of the home environment, environmental or physical, that adversely impacts human health. These public health programs have the common interest of promoting a healthy home environment in order to reduce disease and illness in Connecticut residents.

Asbestos

According to the U.S. EPA, asbestos is the name given to a number of naturally occurring fibrous minerals used in a wide range of manufactured goods, including roofing shingles, ceiling and floor tiles, paper and cement products, textiles, and coatings. The substance was banned in most products in 1989, but legacy building materials still remain in housing. Asbestos has been found in over 3,000 building materials and products. Exposure to airborne, friable asbestos can increase the chance of developing lung cancer, mesothelioma and asbestosis.

Contractors are required to notify CT DPH of demolition or renovation projects involving more than 10 linear feet or more than 25 square feet of asbestos-containing material.

- Approximately 60% of the asbestos abatement notifications received involve renovation or demolition of residential properties. Of the demolition notifications received, approximately 75% involve residential properties. Between July 1, 2009 to June 30, 2010 CT DPH received:
 - 3,385 asbestos abatement notifications.
 - 229 demolition notifications

Asthma/Environmental Triggers

Asthma is a chronic disease of the medium and small airways in the lung. These airways are hypersensitive to certain “triggers” in the environment. Asthma has no cure, but symptoms can be controlled with proper environmental changes and medical management. The Institute of Medicine reviewed medical literature for causes and triggers of asthma; it found that ETS, molds, pest infestations, dust mites, cold air, dry heat and poor ventilation can all trigger asthma.

- The prevalence of asthma in Connecticut increased from 7.8% in 2000 to 9.3% in 2006, slightly higher than the U.S. as a whole.
- In 2006, 13.8% of Connecticut adults reported ever having been diagnosed with asthma and 9.3% reported currently having asthma.
- In 2005, 14.9% (123,000) of Connecticut children reported ever having been diagnosed with asthma, and 10.5% (86,000) reported currently having asthma.
- Residents of the five large cities (Bridgeport, Hartford, New Haven, Stamford, and Waterbury) were nearly three times more likely to be hospitalized or visit an emergency department for their asthma and two times more likely to die from asthma than residents from the rest of Connecticut.

Injury (Unintentional)

Many potential safety hazards in the home can lead to unintentional injuries which include poisonings, such as from carbon monoxide or chemicals; falls; drownings; electrocution; choking; fires and burns. Although Connecticut injury data does not distinguish between residential and non-residential settings, national studies have shown that falls, poisonings, fire/burns, choking/suffocation, and drowning frequently occur in the home environment. These five causes are responsible for approximately 46% of Connecticut’s injury-related deaths.

- Unintentional injuries are the leading cause of death for Connecticut residents between the ages of 1 and 44 years and the 5th leading cause for all ages.
- In 2006 unintentional poisoning surpassed motor vehicle crashes to become the leading cause of injury-related death in Connecticut
- Falls are the leading cause of non-fatal injury across the life span and the leading cause of injury death for older adults in Connecticut. The fall death rate doubled from 2000-2008.
- Inpatient hospital charges totaled \$695 million during 2005-2007 for the top 5 causes.

Average Annual Connecticut Injury Data, 2005-2007 (Numbers)			
Injury Cause	Deaths	Inpatient Hospitalizations	Emergency Department visits
Falls	247	8,804	96,516
Unintentional Poisoning	327	952	4,332
Fire/Burns	25	318	5,202
Choking/suffocation	102	70	369
Drowning	29	14	64

*Data sources: CT CTDPH Vital Statistics, CT Hospital Association

Lead Poisoning

Although lead-based paint was banned in 1978, it remains a significant health threat for children living in older homes where they may be exposed to deteriorating lead-based paint and lead-based paint hazards. Other significant sources of lead exposure include lead-contaminated dust, lead in water (from plumbing), and exterior soil (contaminated by historic use of leaded gasoline and/or the deterioration of exterior lead-based paint on dwellings). Lead hazards can be created as the result of repainting and remodeling projects in older homes. Lead can also tracked into the home by parents or caregivers whose occupations are related to the construction trades. Lead has also been identified in several consumer goods including items such as toys, ethnic remedies, and imported spices. Children are the most at-risk population for childhood lead poisoning. The CTDPH Lead Poisoning Prevention and Control Program conducts disease surveillance as a means to measure the effectiveness of the program’s goals.

In 2009, 737 Connecticut children under the age of six had blood lead levels of greater than or equal to 10µg/dL.

- Black and Hispanic children in urban areas have the highest percentages of elevated blood lead levels in Connecticut; they have approximately a 2x greater risk of lead poisoning when compared to non-black or non-hispanic children

Radon

Radon is a naturally occurring radioactive gas that can be present in indoor air from two sources – soil gases or well water. Radon from soil gases is the most common source of radon in the home. Common entry points for radon gas include dirt basements, cracks and gaps in foundations, drains, and construction joints.

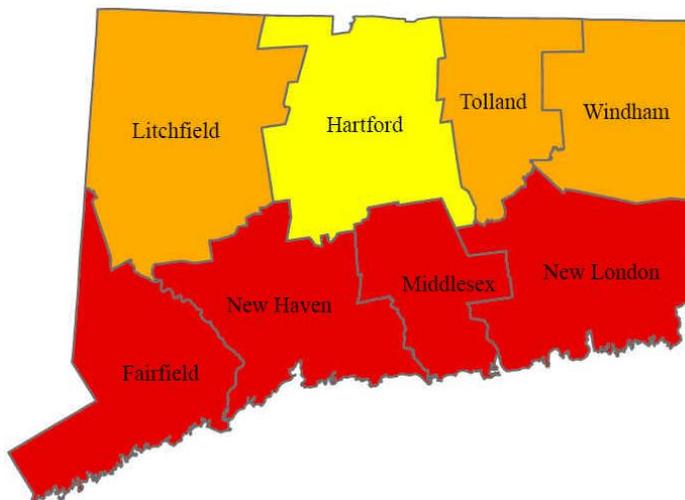
Radon is the leading cause of lung cancer among non-smokers and causes approximately 21,000 lung cancer deaths annually across the country. It is very important to understand that the current action level of 4 picocuries per liter (pCi/L) / is not a health-based standard. There is no known safe level of exposure. In fact, according to the National Academy of Sciences, ‘BEIR VI’ report (1999), and the 2003 EPA radon risk publication (EPA-402R-03-003), the estimated 21,000 radon-induced lung cancer deaths per year (across the U.S.) are based on the average indoor radon level of 1.3pCi

The Radon Program focuses on health promotion, radon awareness, radon-resistant new construction, and quality in radon testing and mitigation carried out in Connecticut homes, and schools. The program collects data on school, child daycare, and residential radon measurement and mitigation activities including the following:

- 932 public schools (>90% of all public schools) have tested for radon
- 91 schools (327 school rooms) have reduced elevated radon levels with mitigation systems

- 1,565 child daycare centers have tested for radon
- Each year, over one thousand homeowners test and reduce radon in their homes
 - Between the period of June 1, 2010 to February 28, 2011,
 - 1,064 reports of residential radon mitigation were submitted to the Department
 - 849 homeowners reduced radon in air
 - 215 homeowners reduced radon in water

Connecticut's radon potential map shows the potential for high levels (>4pCi/L) of radon in the shoreline counties (Fairfield, New Haven, Middlesex, New London) and moderate levels (2-4pCi/L) in the northeast and northwest counties (Windham, Tolland, Litchfield). Though Hartford County is considered a low potential zone for radon, there are still elevated levels of radon found in homes.



The radon potential map is meant as a tool for home construction contractors to determine if a home should be built with Radon Resistant features. The map should not be used to determine whether one should test for radon. **All homes in all Connecticut counties should be tested for radon.**

Private Wells and Drinking Water

The provision of safe water is part of having a healthy home. While public water supplies are under stringent monitoring and reporting protocols, homeowners have the primary responsibility for protecting their own private wells and water supplies. Groundwater in Connecticut can be affected by chemical contamination from a variety of sources such as leaking underground fuel storage tanks and surface spills. Chemicals and fertilizers used on the land can contaminate ground water as can contaminants discharged into septic systems. Other contaminants, such as volatile organic compounds, naturally occurring metals such as arsenic, or radiologicals such as radon, radium or uranium are also potential health hazards for citizens who obtain their drinking water from private wells. Public education about drinking water should help residents' understand from where their water comes, what tests to perform, and how to protect ground water.

- There are approximately 400,000 private wells in Connecticut.
- Nearly 15% of the State's populations, approximately 510,000 people, are served by their own drinking water supply.

Indoor Environmental Quality (IEQ)

The inside air can be many times more polluted than the outside air. Since people spend 90% of their time inside this is an important issue. Indoor air pollutants include: insects, rodents, dust/dirt, mold, bacteria/viruses, carbon monoxide (CO), chemicals such as mercury, formaldehyde, pesticides and household cleaners, and allergens such as pollen and animal

danger. Indoor pollutants can impact health, in particular, asthma and other respiratory diseases, eye and nose irritations, headaches, dizziness, and fatigue.

The goal of the IEQ program is to provide consultation, technical assistance, education, and training regarding environmental conditions in homes, schools and workplaces that can lead to poor IEQ and impact health. Activities include the *Tools for Schools* Program and specialized education and training programs about a variety of indoor environmental quality topics including mold and moisture, and the health-home connection. Activities related specifically to the home environment include trainings, factsheets and guidance documents (carbon monoxide, mold & moisture, green cleaning & disinfecting, ozone generators) for use by the local health departments, housing code enforcement officials, other state agencies, health care providers, and the public.

- Seventy percent of the calls received by the CT DPH Environmental and Occupational Health Program are related to indoor environmental quality issues.

Environmental Tobacco Smoke

Secondhand smoke, also known as environmental tobacco smoke (ETS), is the smoke that comes from both the end of a burning cigarette or other tobacco product, and the smoke exhaled by the smoker. The smoke from the end of a burning cigarette is unfiltered and contains twice as much tar and nicotine as the smoke inhaled through a filter. In 2006, the U.S. Surgeon General issued *The Health Consequences of Involuntary Exposure to Tobacco Smoke*, a comprehensive scientific report which concluded that there is no risk-free level of exposure to ETS.¹ ETS contains more than 50 cancer-causing chemicals, and is itself a known human carcinogen. ETS has been associated with many of the same health problems as smoking and has been identified as a major health risk factor in our homes. According to the U.S. Surgeon General's report, it is a known cause of sudden infant death syndrome (SIDS), respiratory problems, ear infections, and asthma attacks in infants and children. Senior citizens and individuals with chronic health problems are also vulnerable to ETS, which can exacerbate pneumonia, bronchitis, cancer, cardiovascular disease and other health problems.

It has been shown in multi-unit housing that ETS travels through light fixtures, ceiling crawl spaces, open windows, ventilation systems and doorways. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) adopted a position document that states: "At present, the only means of effectively eliminating health risks associated with indoor exposure is to ban smoking activity... No other engineering approaches, including current and advanced dilution ventilation or air cleaning technologies, have demonstrated or should be relied upon to control health risks from ETS exposure..."

In addition to health risks, smoking accounts for a large number of preventable fires and injuries. Michael D. Brown, Under Secretary of Homeland Security for Emergency Preparedness and Response and head of FEMA said "Each year, smoking fires generally result in the highest fatality rate and are among the highest injury rates for residential fires."

¹ <http://www.surgeongeneral.gov/library/secondhandsmoke/>

- Over 450,000 adults in Connecticut smoke cigarettes. Approximately 5,600 people (smokers and non-smokers) in Connecticut die each year from smoking-related causes. Of the 5,600 deaths each year approximately 700 are from ETS.
- The home is the place where children are most exposed to secondhand smoke and a major location of secondhand smoke exposure for adults. Children who live in homes where smoking is allowed have higher levels of cotinine (a biological marker of secondhand smoke exposure) than children who live in homes where smoking is not allowed. As the number of cigarettes smoked in the home increases, children's cotinine levels rise.
- In Connecticut 186,000 children are exposed to ETS at home.
- Approximately 100,000 middle and high school students in Connecticut live with someone who currently smokes cigarettes.
- According to the Connecticut Fire Incident Reporting System smoking materials (tobacco products and lighters) are responsible for 2,376 fires between 2003 and 2010 resulting in \$17,255,947 in property loss.

Connecticut Department of Public Health's Strategic Planning Initiative

CT DPH staff was inspired to initiate their Healthy Homes effort after staff attended HUD's 2008 National Healthy Homes Conference in Baltimore. After initial efforts to brainstorm program ideas with external partners, it was decided to focus first on internal operations, building a team, defining agency goals, and increasing internal coordination and integration. ARC, with initial funding from the Cox Foundation, was brought in during the spring of 2009 to offer facilitative leadership and technical support to identify opportunities for increased internal coordination and integration of Healthy Homes into existing work. With subsequent funding from the Kresge Foundation, ARC put out a request for applications in early 2010 for its' Healthy Homes strategic planning services and CT DPH won the competitive award. Eileen Gunn, Healthy Homes Project Director, facilitated the strategic planning process with support and co-facilitation from Laurie Stillman, Chief Strategy Officer at Health Resources in Action (HRiA).

In the words of CT DPH, *“the Healthy Homes Initiative encompasses several known home-based health hazards and programs, and seeks to coordinate the delivery of services through collaboration with state agencies and community stakeholders.”*

The newly formed Healthy Homes Team was comprised of representatives from CT DPH's nine single-hazard focused programs (Lead, Radon, Asbestos, Drinking Water, Tobacco, Asthma, Indoor Environmental Quality, and Injury). In Connecticut, the majority of single-hazard programs do not have staff that go into the home or provide direct services. The programs' primary functions are to set policy, and to provide guidance documents, technical assistance and funding to local health agents or direct service providers. For that reason, and due to the difficulty in developing initiatives in this economic climate, the initial strategic planning focused on identifying opportunities within existing program activities, such as grants, training and materials development, where modifications could be made to address other home-based hazards, or introduce the Healthy Homes principles.

The Team immediately began implementing many of the opportunities that were identified, and later embarked on the more traditional strategic planning process.

Connecticut Department of Public Health Healthy Homes Team Members

Program/Department	Representative
Environmental Health Section	Suzanne Blancaflor, M.S, M.P.H., Section Chief
Asbestos	Ronald Skomro, R.S., Supervising Environmental Analyst
Asthma	Eileen Boulay, R.N, B.S.N, Asthma and Injury Prevention Program Supervisor
	Salina Hargrove, B.S., Health Program Assistant
	Elizabeth D. Reynolds, RN, BSN, NCSN, Utilization Review Nurse
Environmental & Occupational Health Assessment Program/Indoor Environmental Quality	Joan Simpson, M.S.P.H., Epidemiologist
	Brian Toal, M.S.P.H., Program Coordinator
Injury Prevention	Marian Storch, B.S., Health Program Associate
Childhood Lead Poisoning Prevention and Control Program	Francesca Provenzano, M.P.H., C.H.E.S., R.S, Health Program Supervisor
	Mark Aschenbach, M.S., R.S., Environmental Analyst
	Krista Veneziano, M.P.H., C.H.E.S., R.S, Epidemiologist
Drinking Water Private Well/Recreation Program	Ray Jarema, Section Supervisor (Engineering)
Radon Program	Francesca Provenzano, M.P.H., C.H.E.S., R.S, Health Program Supervisor
	Allison Sullivan, Environmental Analyst
Tobacco Use Prevention & Control Program	Errol Roberts, M.P.A., Health Program Assistant

The Strategic Planning Process Summary

Phase 1 – Internal Coordination (Year One)

The first year was focused internally on mapping internal activities, identifying opportunities for increased coordination, and early implementation of priority activities.

- √ Established Healthy Homes Team with cross-programmatic representation.
- √ Held twelve Healthy Homes Team meetings throughout the first year to learn about other program’s roles and functions in addressing home-based hazards, identified common target populations, and potential overlapping program activities, in order to identify areas for coordination.
- √ Identified and prioritized activities for Healthy Homes integration and internal coordination.

(Year Two) – With the increased understanding of internal operations among single-hazard programs, the Team developed a baseline, and embarked on a more formal strategic plan development.

- √ ARC conducted and summarized nine individual interviews on vision, goals, objectives, and desired partnership activities.

- √ Held a summit and follow-up meetings to define Connecticut's vision and goals, objectives and strategies for a healthy homes initiative.

Phase II External Coordination (Year Two)

- √ Identified goals that needed external collaboration and coordination.
- √ Identified key external agency and organizational partners to approach for support in implementing shared goals and developing an inter-organizational action plan.
- √ Enlisted external partners and sought buy-in and support for shared goals.
- √ Developed three Inter-organizational Workgroups to develop an Action Plan for Inter-organizational Coordination.
- √ Finalized an Inter-organizational Structure for strategic plan implementation.

Connecticut Strategic Plan for Healthy Homes

Vision

Every Connecticut resident lives in a healthy and safe home environment.

Mission

The mission of the Connecticut Healthy Homes Team is to develop statewide partnerships and implement comprehensive policies and coordinated program activities that foster a healthy and safe home environment, reduce housing related health disparities, and improve the public's health.

Goals, Objectives and Strategies

Goal 1: Increase awareness of home-based hazards, health-related impacts, remedial strategies, and a preventative approach to healthy homes among targeted audiences.

Objective 1 - Promote the connection between health and housing for stakeholders.

Strategy a - Develop a health and housing data book or factsheet and presentation that conveys Connecticut's housing statistics and related health disparities.

Strategy b - Present on Connecticut's housing statistics and related health disparities at events and organizational meetings.

Strategy c - Integrate Healthy Homes messages into existing CT DPH program outreach activities.

Objective 2 - Develop and disseminate educational messages and materials on home-based hazards, prevention approaches, and remedial strategies.

Strategy a - Identify priority target audiences and develop necessary educational materials.

- Strategy b - Develop and conduct educational programs for target audiences.*
- Strategy c - Identify internal and external partners that provide public education on home-based hazards and work to incorporate healthy homes concepts into existing outreach materials.*
- Strategy d - Develop outreach, dissemination and evaluation plan for materials and trainings.*

Goal 2: Develop and improve policies, guidelines and practices to achieve a healthy and safe home environment.

Objective 1: Define the components of a healthy home.

- Strategy a - Explore and refine the Housing and Urban Development's and Center for Disease Control's definitions of a Healthy Home to suit the State of Connecticut.*
- Strategy b - Review healthy homes pilot program components to determine applicability for statewide scale.*
- Strategy c - Gain consensus among partners who work in health and housing.*

Objective 2: Develop guidelines and practices.

- Strategy a - Develop guidelines and practices for conducting healthy homes assessments for residential dwellings.*
- Strategy b - Develop guidelines and practices for preventing home-based hazards.*
- Strategy c - Develop guidelines and practices for conducting remedial activities.*

Objective 3: Develop and enhance policies.

- Strategy a - Identify and evaluate existing pertinent public health, safety, and housing policies.*
- Strategy b - Conduct a gap analysis in order to determine what policies and codes are needed to meet the standards and practices of a healthy home.*
- Strategy c - Develop new policies as needed.*

Objective 4: Enhance enforcement of existing codes.

- Strategy a - Train enforcement officials and inspectors on specific healthy homes approaches and corrective actions that fit under their regulatory authority.*

Goal 3: Establish and increase adoption of coordinated and effective healthy homes programs and efforts across the state.

Objective 1 - Increase internal coordination across the Department of Public Health's programs to promote the healthy homes approach.

- Strategy a - Maintain the Healthy Homes Team and Healthy Homes Initiative.*
- Strategy b - Identify additional programs within the Department of Public Health to enhance coordination and integration of healthy homes activities.*

Objective 2 - Increase coordination with external agency partners to promote healthy homes.

- Strategy a - Develop and disseminate a CT DPH Strategic Plan Summary briefing document.*
- Strategy b - Identify local, state, and regional partners to collaborate and promote a statewide approach to healthy home.*
- Strategy c - Form an inter-agency working group and engage partners in developing an "Inter-Agency Action Plan for Healthy and Safe Home Environments."*

Objective 3 - Support local agencies in implementing healthy home programs and services.

Strategy a - Train local health and housing officials in a healthy homes approach.

Strategy b - Utilize existing funding sources for implementation of healthy homes programs and services.

Strategy c - Seek and establish sustainable funding sources for healthy homes implementation.

Strategy d - Continually build technical capacity of local officials to carry out healthy homes activities.

Goal 4: Develop a healthy homes workforce that has comprehensive knowledge of home hazards and interventions.

Objective 1 - Develop and conduct education and training programs for target professional audiences.

Strategy a - Develop and deliver an interdisciplinary home hazard training program that will assist existing home-based hazard professionals in expanding their knowledge and capabilities.

Strategy b - Where appropriate, utilize existing healthy homes trainings for specific audiences or workers.

Strategy c - Develop a curriculum for vocational/technical schools.

Strategy e - Expand content of existing professional training programs to include healthy home concepts.

Objective 2 – Promote uniform adoption of best practices and professionalism.

Strategy a - Promote policies, guidelines, and best practices for home assessments, prevention activities, and remedial strategies.

Strategy b - Identify current healthy homes trainings that promote best practices.

Strategy c - Promote the national credential for Health Homes Specialist.

Goal 5 - Evaluate outcomes of the strategic plan goals.

Objective 1 - Develop mechanisms for tracking housing conditions, resident behaviors, and program impacts that will assist us in targeting program populations and resources.

Strategy a - Review available tracking systems, or develop a database system to capture healthy homes assessment findings and interventions.

Strategy b - Identify existing the Department of Public Health data sets that can be included and used to quantify existing hazards, risks, and geographic locations where services are most needed.

Strategy c - Generate reports that will quantify the hazards identified during the assessments and measure the impact of the interventions.

Goal 6 - Identify resources to sustain healthy homes programs.

Objective 1: Identify sources and acquire funding for sustainable healthy homes programs.

Strategy a - The Healthy Homes Team will identify funding sources to sustain healthy homes programs.

Strategy b - The Healthy Homes Team members will seek to increase flexibility of existing grant requirements to allow other home hazards to be addressed.

Strategy c - Identify and work with key partnerships to leverage funding opportunities.

Strategy d - Build healthy homes program requirements into existing grant applications.

Strategy e - Work toward insurance reimbursement for home assessments.

Objective 2: Dedicate staff at state level for healthy homes initiative.

Strategy a - Once funding is allocated or obtained, the Department of Public Health will dedicate one full -time equivalent to the Healthy Homes Initiative to coordinate inter- and intra-agency activities.

Strategy b - Maintain staff participation from each single-hazard program on the Healthy Homes Team.

Strategy c - Provide on-going, cross-training among staff of different hazard programs to ensure sustainability of the healthy homes initiative.

Early Successes and Key Accomplishments

The CT Healthy Homes Team identified and began implementation of several opportunities for policy change and integration of healthy homes into existing activities. These notable achievements are listed here.

Baseline Housing and Health Conditions

✓ CT Health and Housing Baseline

The respective representatives from each single hazard program compiled their housing-related health statistics, such as lead poisoning levels, asthma cases, radon deaths, and fatal and non-fatal injuries into one document referred to as a *Healthy Housing Databook* (modeled after Rhode Island Health Department's Healthy Housing Databook). ARC requested this for the team to see their common connections in housing, and also for a public education tool to convey the importance of healthy homes and a holistic approach.

Policy Change and Internal Program Integration Activities

✓ Developed contract language, hazard-specific deliverables and a unified healthy homes checklist.

✓ Developed a more holistic funding strategy by agreeing upon a “Healthy Homes” option for CDC's Preventive Health and Human Services Block Grant. This would allow local health agents to use monies to focus on at least three home hazards rather than the typical single hazard focus.

✓ Included a healthy homes expense line item into Lead and Radon Program grant applications.

✓ The Private Wells Program utilized public water supply data to target risk communication messaging to local health agents who, in turn, can make recommendations for private well testing.

✓ Incorporated healthy homes module into the Lead Inspector/Lead Inspector-Risk Assessor annual refresher course for code enforcement officials.

Education and Technical Capacity Building

- ✓ Presented on the Healthy Homes Initiative to the CT Environmental Health Association and CT Association of Housing Code Enforcement Officials, as well as to local health departments.
- ✓ Offered the National Center for Healthy Homes 2-day Essentials Course for CT Health and Housing Officials in June and November 2010.
- ✓ Constructed a modified course outline for the development of a Connecticut-specific healthy homes course for housing and health officials.
- ✓ Presented healthy homes concepts and principles at the annual Environmental Health Training Program Course at Southern Connecticut State University.

Materials Development

- ✓ Developed a healthy homes website.
- ✓ Updated the Real Estate Guide for Healthy Homes: Environmental Hazards in the Home.
- ✓ Developed a Healthy Homes poster

External Agency Program and Policy Coordination

- ✓ Submitted testimony and language to the Department of Economic and Community Development (DECD) for modification of the State's Consolidated Plan, which describes how the state will address lead hazards in housing. The Plan now indicates that additional home hazards will be addressed as described by HUD's Healthy Homes Strategic Plan.
- ✓ Incorporated radon testing into lead-related home visits conducted by local and regional staff.
- ✓ Gained support for the strategic plan from numerous partnering agencies and organizations across the state.
- ✓ Developed inter-organizational workgroups, a structure, and completed an Inter-Organizational Action Plan for Healthy Homes. This action plan outlines a timeline, responsible parties, partners, and the steps that will be taken to implement goals, objectives, and strategies outlined in the strategic plan.

Inter-Organizational Coordination - Action Planning for Shared Goals

To achieve the goals, objectives and strategies developed, it was recognized early on that broad partnerships were necessary for successful implementation. The Healthy Homes Team identified a broad list of potential partners who had common organizational goals, worked to gain support for a set of common objectives, and solicited a commitment for shared implementation. These consisted of both local and state governmental health and housing-related agencies, and non-governmental education and advocacy organizations.

An extremely successful “Partners Kickoff” meeting was held in October 2010 to present the plan and gather input. After discussion, there was consensus that the plan was complete and offered a solid roadmap for statewide action. Then, four shared goal areas were set up and participants spent a lively hour indicating their current supporting activities, ideas, and willingness to partner in implementation activities. The information was used to prioritize areas for action, determine participants, and develop a proposal for moving forward.

In a follow-up meeting in December 2010, the Team and ARC presented the compiled results from the previous meeting, and proposed a structure of three workgroups (Public Awareness, Policies and Practices, Workforce Development), prioritized strategies for action planning, and created a timeline of three months to complete an Inter-organizational Action Plan for Healthy Homes. The group was in full agreement with the proposal; members self-assigned themselves to a workgroup, and began the process of planning coordinated activities. The workgroup members are listed below. After a series of meetings, the three workgroups convened to present their action plans, which outline specific steps to be taken to implement the strategies, a timeline, and responsible parties. Final comments were incorporated in the workgroup plans and structures were agreed upon.

The Inter-organizational Action Plan for Healthy Homes is a working document that will provide the roadmap for the first three years of implementation of Connecticut's Healthy Homes Strategic Plan.

Members of the Healthy Homes External Partners Workgroups

Workgroup #1 – Public Awareness

Joan Bothell	University of Connecticut, Healthy Environments for Children
Mary Buckley Davis	Ledgelight Health District
Mary-Margaret Gaudio	University of Connecticut, Healthy Environments for Children
Amy Hanoian-Fontana	CT Poison Control Center, University of Connecticut Health Center
Dawn Mays- Hardy	American Lung Association CT and MATCH Coalition
Hilary Norcia Co Facilitator	Central CT Health District
Marilyn Parks-Jones	CT Department of Public Health, Day Care Licensing Program
Judy Prill	CT Department of Environmental Protection
Mary Sherwin	CT Department of Environmental Protection
Liz Reynolds	CT Department of Public Health, Asthma Program
Errol Roberts	CT Department of Public Health, Tobacco Use Prevention and Control Program
Joan Simpson DPH Facilitator	CT Department of Public Health, Environmental and Occupational Health Assessment Program/Indoor Environmental Quality
Mary Beth Smuts	Environmental Protection Agency, New England Region
Marian Storch	CT Department of Public Health, Injury Prevention Program

Workgroup #2: Workforce Development:

Francesca Provenzano DPH Facilitator	CT DPH-Lead, Radon, HH
Chris Corcoran Co-facilitator	Lead Action for Medicaid Primary Prevention (LAMPP)
Salina Hargrove	CT DPH-Asthma
Kathi Traugh	Yale School of Public Health, Office of Workforce Development

	(and also representing CT Public Health Workforce Development Committee)
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Workgroup #3: Policies, Guidelines and Practices

Mark Aschenbach DPH Facilitator	CT DPH-Childhood Lead Poisoning Prevention and Control Program
Allison Sullivan	CT DPH – Radon program
Amy Hanoian-Fontana	CT Poison Control Center
Amy Salls	NCHH (formerly LAMPP Lead and HH)
Bob Nakano	Department of Consumer Protection
Edith Pestana	Department of Environmental Protection – Environmental Justice
Eileen Boulay	CT DPH - Asthma
Gus Sarno	CT Housing and Finance Authority
Janita Hamel	Department of Consumer Protection
Jennifer Martin	CT Housing and Finance Authority
Judith Dicine	Supervisory Asst. State’s Attorney (Statewide Housing Matters)
Julia Hatton	United Illumination Corp., (DoE grant)
Sabine Kuczo	Bridgeport Lead-Free Families
Lisa Humble	CT Department of Public Safety -State Building Official
Lydia Brannin	Naugatuck Valley Health District (HUD Lead Grant Recipient)
Marco Palmieri	Plainville Health Department CT Environmental Health Association representative
Michael Santoro Co-Facilitator	CT Department of Economic and Community Development
Mike Nintean	Building Official (Mansfield, CT)
Pat Checko	MATCH Coalition (tobacco)
Ray Jarema	CT DPH – Private Wells Program
Ron Skomro	CT DPH – Asbestos Program
Ronald Kraatz	LAMPP
Tammy Talton	Bridgeport Neighborhood Trust (HUD Lead Grantee)
Terri Trenholm	Department of Social Services – weatherization staff member

Appendix A: Evidenced-based Housing Interventions that Improve Public Health

The National Center for Healthy Housing conducted a review of evidenced-based housing interventions that demonstrably improve public health. They classified their findings into four categories based on the evidence that the intervention improves public health: sufficient evidence needs more field evaluation, needs formative research, and no evidence of effectiveness. The following are excerpts from that report and a listing of the interventions in the first two classifications. For the entire report, see <http://www.nchh.org/Portals/o/Contents/HousingInterventionsandHealth.pdf>

I. Indoor Biologic Agents and Asthma Control

Excess moisture in a home can support the growth of mold and also provides an environment favorable to dust mites, cockroaches, mice, rats and other pests. Structural and plumbing deficiencies in a home are a source of water intrusion and also provide a mechanism for rodents, cockroaches, and other pests to gain entry into the home. The National Academy of Sciences (2000) examined the current knowledge of the association between exposure to biologic agents in the home and the development and exacerbation of asthma. The review found sufficient evidence to establish a casual association between a number of respiratory conditions, including asthma exacerbation, and the presence of house dust mites, cockroaches, fungi (mold), and pet dander (Institute of Medicine 2000). In addition, subsequent studies have shown that rodents may be an important indoor allergen affecting inner-city and suburban children with asthma.

Sufficient Evidence of an Effective Intervention

1. **Multi-faceted in-home interventions for asthma** tailored to the individual, as exemplified by the National Cooperative Inner City Asthma Study, are effective in controlling asthma symptoms and reducing other measures of asthma morbidity. These interventions include home environmental assessment; education; use of mattress and pillow covers; use of HEPA vacuums and HEPA air filters; smoking cessation and reduction in environmental tobacco smoke exposure; cockroach and rodent management; minor repairs, and intensive household cleaning.
2. **Cockroach control through Integrated Pest Management (IPM)** was found to be an effective intervention in reducing exposures to pests, as well as reducing exposures to pesticides. IPM includes household cleaning and tool dispensing, professional cleaning, education of residents, baits and structural repairs and when necessary, intensive application of low-toxicity, non-spray pesticides.
3. **Mold and Moisture Control** - When implemented together, eliminating moisture intrusion and leaks and removal of moldy items were found to be effective in reducing asthma triggers and reducing exposures.

Promising Interventions That Need More Field Evaluation

4. **Moisture control** through dehumidification, improved general and local exhaust ventilation, use of air cleaning devices, repeated dry-steam cleaning, and repeated vacuuming were all identified as promising interventions that need more field testing.

II. Indoor Chemical Agents

Indoor chemical agents have been associated with neurotoxicity and developmental disorders, asthma and other respiratory illnesses, and cancer. Indoor chemical agents include lead, pesticides, environmental tobacco smoke, carbon monoxide, volatile organic compounds, radon and others. Exposure to high levels of substances such as carbon monoxide has been associated with fatalities. Structural deficiencies, gas stoves, introduction of source materials that off-gas or otherwise release toxic agents are all housing factors that can increase the presence of chemical agents in or around a dwelling. Because most homes in the U.S. do not have a planned supply of fresh air delivered to the building space and instead rely on operation of windows and intermittent or inadequate building leakage, indoor airborne contaminants can increase. The absence of smooth and cleanable surfaces can also contribute to increases in pesticide residues, lead contaminated house dust and other accumulated toxicants.

Sufficient Evidence of an Effective Intervention

1. **Active radon mitigation** in high-risk areas is effective in reducing exposure to radon in air to less than 4 pCi/L.
2. **IPM** is effective as a means of reducing exposure to pesticide residues.
3. **Smoking bans** are effective in reducing exposure to environmental tobacco smoke.
4. **Residential lead hazard control** is effective in reducing exposure to deteriorated lead-based paint, dust lead and soil lead.

Promising Interventions That Need More Field Evaluation

1. **Radon mitigation for drinking water using activated charcoal and aeration.**
2. **Portable HEPA Air Cleaners for indoor particulate control.**
3. **Garage sealing** to reduce benzene and other VOC Exposures.
4. **Particulate intrusion reduction and improved ventilation.**

III. Drinking water

Approximately 15 percent of homes in the United States rely on their own private drinking water supplies. Although some state and local governments set rules to protect users of these wells, these supplies are not subject to EPA standards. Unlike public drinking water systems that serve many people, households that have private water supplies generally do not have experts who routinely check the water's source and its quality before it is sent to the tap. These households must take special precautions to ensure the protection and maintenance of their drinking water supplies.

Sufficient Evidence of an Effective Intervention

1. **National voluntary treatment standards** for drinking water and wastewater in decentralized, unregulated systems.

2. **Enhance training centers** by providing on-site hands-on training.
3. **Guidelines for immuno-compromised individuals.**

Promising Interventions That Need More Field Evaluation

1. **UV and Other Filtration Point of Use Systems.**
2. **Location of failed water systems and privies.**

IV. Structural Deficiencies

Structural and other deficiencies in housing are important causes of fatal and non-fatal injury and encompass factors related to construction, design, installation, and lack of maintenance. Structural deficiencies in a house can cause falls, fires, burns and scalds, carbon monoxide and other poisoning, drowning and other injuries.

Sufficient Evidence of an Effective Intervention

1. **Installed, working smoke alarms.**
2. **Isolation 4-sided pool fencing.**
3. **Pre-set safe temperature hot water heaters.**

Promising Interventions That Need More Field Evaluation

1. **Fall prevention through home modifications** such as installation of stair gates, window guards, handrails, grab bars, window guards and improved lighting.
2. **Temperature-controlled mixer faucets.**
3. **Safe ignition sources** (e.g., electrical and heating systems).
4. **Home modification to improve ability to escape fires** (e.g., egress windows and doors, exit signage, protected stairways).
5. **Working air conditioning** during heat waves.

V. Intersection of Housing and Neighborhood

Sufficient Evidence of an Effective Intervention

1. **Rental Vouchers.**

Promising Interventions That Need More Field Evaluation

1. **Health Impact Assessments (HIA).**
2. The Moving to Opportunity Demonstration Program (MTO): **Relocation to Low-poverty Neighborhoods.**
3. HOPE VI – **Demolition of Distressed Public Housing and Relocation of Residents**