National Center for Healthy Housing

National Healthy Homes Training Center and Network

Essentials for Healthy Homes Practitioners Course

Index to References

Summary of Two Key Institute of Medicine Reports Regarding Asthma, Indoor Air Quality, Damp Indoor Spaces, and Mold

Association Between Biological and Chemical Exposures in the Home and			
Development of Asthma in Sensitive Individuals		**Exacerbation of Asthma in Sensitive Individuals**	
Biological Agents	**Chemical Agents**	**Biological Agents**	**Chemical Agents**
Sufficient Evidence of a Causal Relationship			
• House dust mite	*No agents met this definition*	• Cat • Cockroach • House dust mite	• ETS (in preschool-aged children)
Sufficient Evidence of an Association			
No agents met this definition	• ETS (in preschool-aged children)	• Dog • Fungi or molds • Rhinovirus	• Nitrogen oxides (high-level exposures)[1]
Limited or Suggestive Evidence of an Association			
• Cockroach (in preschool-aged children) • Respiratory Syncytial Virus	*No agents met this definition*	• Domestic birds • *Chlamydia pneumoniae* • *Mycoplasma pneumoniae* • Respiratory Syncytial Virus	• ETS (in school aged and older children, & adults) • Formaldehyde • Fragrances
Inadequate or Insufficient Evidence to Determine Whether or Not an Association Exists			
• Cat, Dog, Domestic Birds • Rodents • Cockroaches (except for preschool-aged children) • Endotoxins • Fungi or molds • *Chlamydia pneumoniae* • *Mycoplasma pneumoniae* • *Chlamydia trachomatis* • Houseplants • Pollen	• Nitrogen oxides • Pesticides • Plasticizers • Volatile organic compounds (VOCs) • Formaldehyde • Fragrances • ETS (in older children and adults)	• Rodents (as pets or feral animals)[2] • *Chlamydia trachomatis* • Endotoxins • Houseplants • Pollen exposure in indoor environments • Insects other than Cockroaches	• Pesticides • Plasticizers • Volatile organic compounds (VOCs)
Limited or Suggestive Evidence of No Association			
• Rhinovirus (adults)	*No agents met this definition*	*No agents met this definition*	*No agents met this definition*

Source: ***National Academies Press, 2000****. Clearing the Air: Asthma and Indoor Air Exposures. Executive Summary Institute of Medicine. ISBN 0-309-06496-1 See www.nap.edu/books/0309064961/html/.*

[1] At concentrations that may occur only when gas appliances are used in poorly ventilated kitchens.

- **Sufficient Evidence of a Causal Relationship:** Evidence fulfills association criteria and in addition satisfies criteria regarding the strength of association, biologic gradient (dose-response effect), consistency of association, biologic plausibility and coherence, and temporality used to assess causality.
- **Sufficient Evidence of an Association:** Association has been observed in studies in which chance, bias, and confounding factors can be ruled out with reasonable confidence (e.g. several small bias free studies showing an association that is consistent in magnitude and direction
- **Limited or Suggestive Evidence of an Association:** Evidence is suggestive of an association but is limited because chance, bias, and confounding cannot be ruled out with confidence (e.g. one high quality study shows association, but results of other studies are inconsistent)
- **Inadequate or Insufficient Evidence to Determine Whether or Not an Association Exists:** Available studies are of insufficient quality, consistency, or statistical power to permit a conclusion; or no studies exist
- **Limited or Suggestive Evidence of No Association:** Several adequate studies are mutually consistent in not showing an association (but limited to the conditions, level of exposure, and length of observation covered in the study).

Summary of Two Key Institute of Medicine Reports Regarding Asthma, Indoor Air Quality, Damp Indoor Spaces, and Mold

Summary of Findings Regarding Association Between Health Outcomes and	
Exposure to Damp Indoor Environments	**Presence of Mold or Other Agents in Damp Indoor Environments**
Sufficient Evidence of a Causal Relationship	
Sufficient Evidence of an Association	
• Upper respiratory (nasal and throat) tract symptoms • Cough • Wheeze • Asthma symptoms in sensitized persons	• Upper respiratory (nasal and throat) tract symptoms • Cough • Hypersensitivity pneumonitis in susceptible persons • Wheeze • Asthma symptoms in sensitized persons
Limited or Suggestive Evidence of an Association	
• Dyspnea (shortness of breath) • Lower respiratory illness in otherwise healthy children • Asthma development	• Lower respiratory illness in otherwise healthy children
Inadequate or Insufficient Evidence to Determine Whether or Not an Association Exists	
• Airflow obstruction (in otherwise healthy persons) • Skin symptoms • Mucous membrane irritation syndrome • Gastrointestinal tract problems • Chronic obstructive pulmonary disease • Fatigue • Inhalation fevers (nonoccupational exposures) • Neuropsychiatric symptoms • Lower respiratory illness in otherwise healthy adults • Cancer • Acute idiopathic pulmonary hemorrhage in infants • Reproductive effects • Rheumatologic and other immune diseases	• Dyspnea (shortness of breath) • Skin symptoms • Asthma development • Gastrointestinal tract problems • Airflow obstruction (in otherwise healthy persons) • Fatigue • Mucous membrane irritation syndrome • Neuropsychiatric symptoms • Chronic obstructive pulmonary disease • Cancer • Inhalation fevers (nonoccupational exposures) • Reproductive effects • Lower respiratory illness in otherwise healthy adults • Rheumatologic and other immune diseases • Acute idiopathic pulmonary hemorrhage in infants

Source: ***National Academies Press, 2004****. Damp Indoor Spaces and Health. Tables ES-1 and ES-2*
Institute of Medicine of the National Academies, ISBN 0-309-09246-9.
See www.nap.edu/books/0309091934/html/.

- **Sufficient Evidence of a Causal Relationship:** Evidence is sufficient to conclude that a causal relationship exists between the agent and the outcome. That is, the evidence fulfills the criteria for "sufficient evidence of an association" and, in addition, satisfies the following criteria: strength of association, biologic gradient, consistency of association, biologic plausibility and coherence, and temporally correct association.

- **Sufficient Evidence of an Association:** Evidence is sufficient to conclude that there is an association. That is, an association between the agent and the outcome has been observed in studies in which chance, bias, and confounding can be ruled out with reasonable confidence.

- **Limited or Suggestive Evidence of an Association:** Evidence is suggestive of an association between the agent and the outcome but is limited because chance, bias, and confounding cannot be ruled out with confidence.

- **Inadequate or Insufficient Evidence to Determine Whether an Association Exists:** The available studies are of insufficient quality, consistency, or statistical power to permit a conclusion regarding the presence of an association. Alternatively, no studies exist that examine the relationship.

World Health Organization Regional Office for Europe
Quantifying Disease from Inadequate Housing

Housing Inadequacy	Disease
*Linkages with **sufficient evidence** for estimating burden of disease*	
Heat	Related cardiovascular effects and/or excess mortality
Cold indoor temperatures	Winter excess mortality
Energy efficiency of housing	Health
Radon exposure in dwellings	Cancer
Neighbourhood and building noise	Related health effects
Environmental tobacco smoke in dwellings	Respiratory and allergic effects
Lead in paint, dust, soil, and drinking water	Lead-related health effects
Humidity and mould in dwellings	Related health effects
Hygrothermal conditions	House dust mite exposure & respiratory disease
Building and equipment factors	Injuries / domestic accidents
Injury Database on domestic accidents	Injuries
Multifamily housing, high-rise housing, and housing quality	Mental health
*Linkages with **some evidence** for estimating burden of disease*	
Ventilation in the dwelling	Respiratory and allergic effects
Volatile organic compounds	Respiratory, cardiovascular and allergic effects
Cockroaches and rodents in dwellings	Respiratory and allergic effects
Cats, dogs, and mites in dwellings	Respiratory and allergic effects
Pets and mites	Respiratory, allergic or asthmatic effects
Sanitation and hygiene conditions	Related physical health effects
Social conditions of housing	Fear / fear of crime
Poverty and social exclusion	Related health effects
Crowding	Related health effects
Social factors / social climate	Mental health
*Linkages with **insufficient evidence** for estimating burden of disease*	
Lighting conditions in the dwelling	Mental and other health effects
Particulate matter in indoor air	Respiratory and allergic effects

Summary Report prepared by National Center for Healthy Housing from the "Report on the WHO technical meeting on quantifying disease from inadequate housing," Bonn, Germany, 28-30 November, 2005. See www.euro.who.int/Document/HOH/EBD_Bonn_Report.pdf. For more information on WHO Regional Office for Europe's work on housing and health, see www.euro.who.int/Housing/20060519_2.

Percentage of Households reporting smoke-free home rules, by state/area - Current population Survey, United States, 1992-93, 1998-99, and 2003				
State/Area	**1992 - 1993**	**1998 - 1999**	**2003**	**% change from 1992-1993 to 2003**
Utah	69.6	81.1	88.8	27.6
California	59.1	72.7	84.4	42.9
Arizona	54.4	71.6	82.4	51.5
Oregon	50.0	68.0	81.2	62.4
Hawaii	51.5	65.0	79.7	54.9
Nevada	45.5	63.7	79.6	74.9
Colorado	48.3	65.2	79.3	64.3
Washington	54.3	68.9	79.3	46.2
Idaho	50.6	70.3	78.8	55.9
Texas	46.3	65.3	78.5	69.5
Florida	50.2	66.0	78.5	56.4
Georgia	41.8	61.9	77.4	85.4
Maryland	43.0	64.3	75.9	76.6
Alaska	50.9	60.9	75.8	48.8
Massachusetts	40.3	60.1	75.5	87.6
New Mexico	45.6	62.7	75.5	65.8
New Hampshire	38.4	56.5	74.6	94.4
New Jersey	45.5	61.3	74.0	62.5
Connecticut	44.7	60.1	73.4	64.2
Virginia	39.3	58.4	72.7	85.1
Minnesota	39.7	61.5	71.5	80.1
South Dakota	36.8	57.1	71.1	93.2
Alabama	38.9	59.1	70.9	82.1
New York	41.6	58.3	70.5	69.5
Montana	43.1	61.0	70.0	62.5
Rhode Island	38.9	60.4	69.8	79.6
Delaware	40.1	55.4	69.7	73.7
Mississippi	41.2	54.9	69.6	69.1
Vermont	39.1	59.7	69.3	77.5
Nebraska	39.9	59.5	69.2	73.3
Maine	39.4	54.4	69.0	75.1
Louisiana	37.3	58.2	68.6	83.9
North Dakota	41.2	56.4	68.2	65.7
District of Columbia	41.4	56.6	68.1	64.7
Iowa	36.1	52.9	68.0	88.6
Pennsylvania	39.9	56.3	67.5	69.0
South Carolina	40.2	58.6	67.5	67.9
Kansas	39.9	59.3	66.9	67.8
Wisconsin	36.7	55.4	66.4	81.1
Wyoming	38.6	58.0	65.5	69.8
North Carolina	34.3	53.0	65.4	90.8
Illinois	38.6	54.6	64.8	68.0
Oklahoma	39.2	54.1	64.7	64.9
Tennesse	34.1	52.0	64.2	88.3
Missouri	34.5	53.7	64.0	85.7
Indiana	33.9	47.9	62.7	85.2
Ohio	35.1	51.4	60.8	73.2
Michigan	35.4	51.2	60.7	71.7
Arkansas	33.2	53.0	60.1	81.0
West Virginia	27.8	42.8	57.1	105.5
Kentucky	25.7	38.9	53.4	107.9
Minimum	*25.7*	*38.9*	*53.4*	*27.6*
Maximum	*69.6*	*81.1*	*88.8*	*107.9*
Range	*43.9*	*42.3*	*35.4*	*80.2*
Median	*39.9*	*58.6*	*69.8*	*71.7*
Total	**43.2**	**60.2**	**72.2**	**67.1**

U.S. Centers for Disease Control and Prevention, Morbidity Mortality Weekly Report, May 25, 2007, 56(20);501-504. See www.cdc.gov/mmwr/preview/mmwrhtml/mm5620a3.htm.

Midcourse Review

HEALTHY PEOPLE 2010

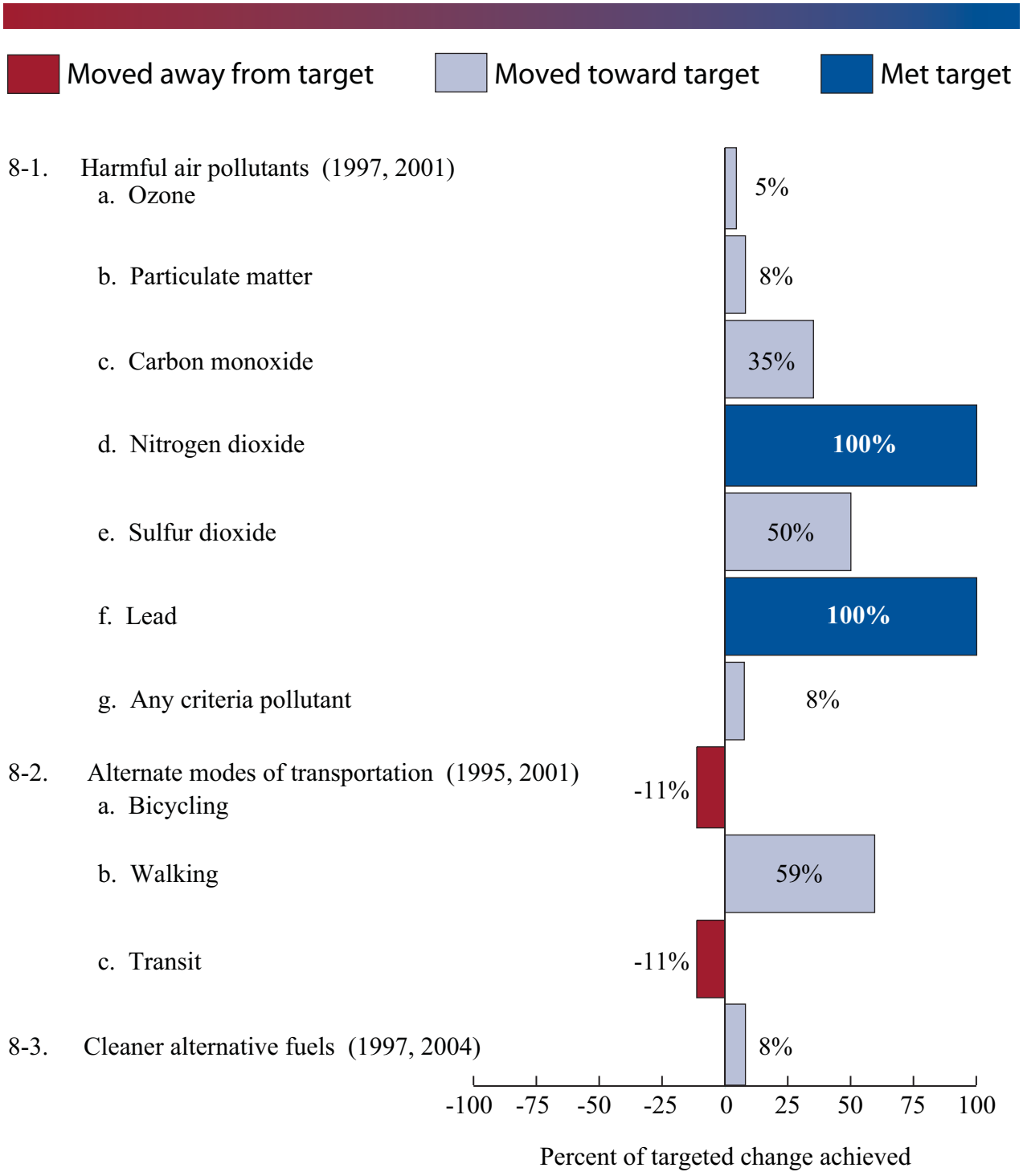
Environmental Health 8

Co-Lead Agencies:

Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
National Institutes of Health

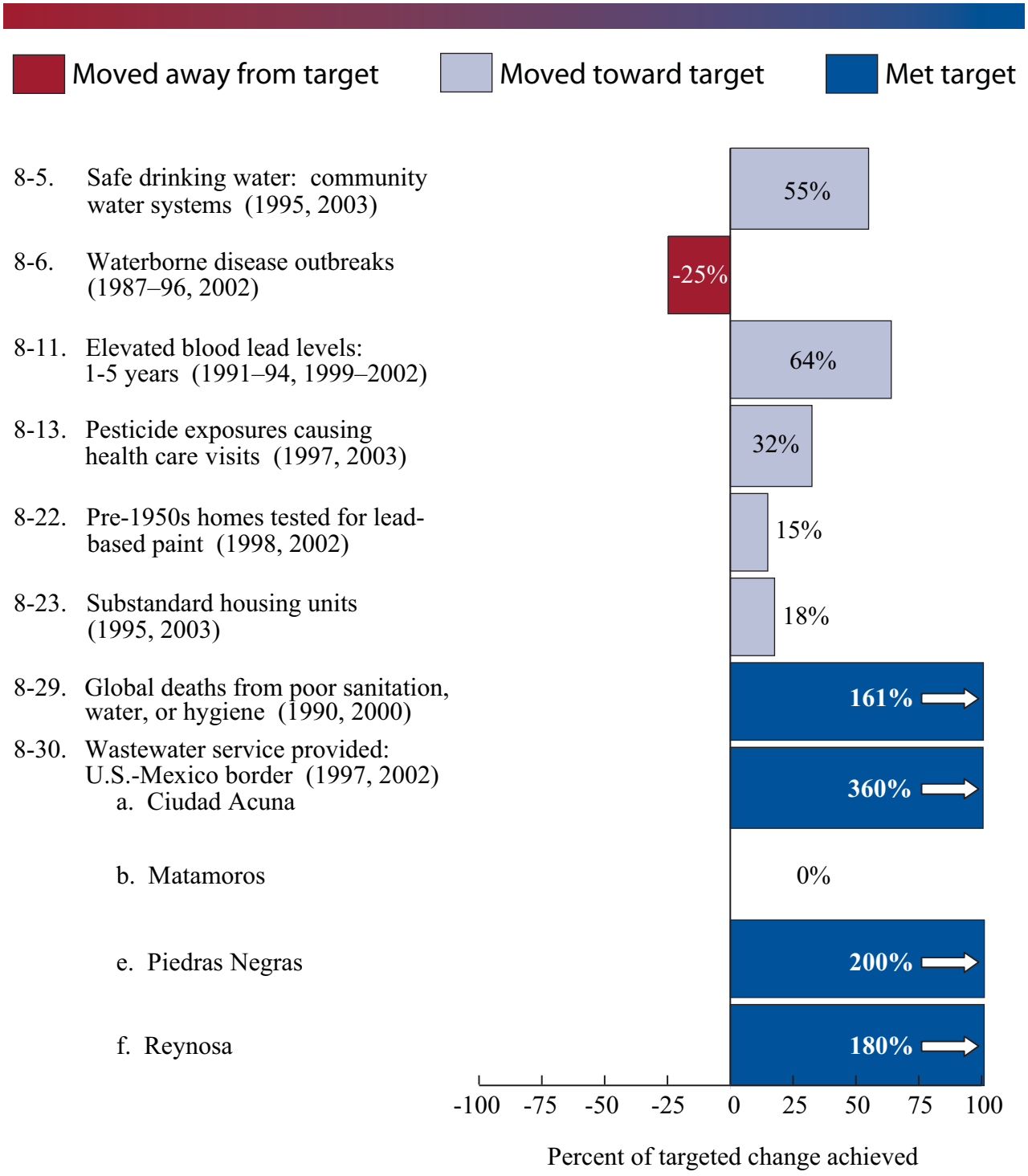
Contents

Figure 8-1. Progress Quotient for Focus Area 8: Environmental Health



See notes at end of chart. *(continued)*

Figure 8-1. *(continued)*



See notes at end of chart. *(continued)*

Healthy People 2010 Objectives Related to Healthy Homes
Mid-Course Review – 2005

NO CHANGE IN OBJECTIVE

8-11. Eliminate elevated blood lead levels in children.

Target: Zero percent.

Baseline: 4.4 percent of children aged 1 to 5 years had blood lead levels exceeding 10 µg/dL during 1991–94.

Target setting method: Total elimination.

Data source: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

NO CHANGE IN OBJECTIVE
(Data updated and footnoted)

8-13. Reduce pesticide exposures that result in visits to a health care facility.

Target: 11,398[1] visits per year.

Baseline: 22,933[2] visits to health care facilities were due to pesticides in 1997. (A total of 172,088[3] pesticide exposures were documented in 1997.)

REVISED OBJECTIVE

8-16. Reduce indoor allergen levels.

Target and baseline:

Objective	Reduction in Proportion of Homes With Measured Allergens	1998 Baseline	2010 Target
		Percent	
8-16a.	Group I dust mite allergens that exceed 2 micrograms per gram of dust in the bed	46.2	37.0
8-16b.	Group I dust mite allergens that exceed 10 micrograms per gram of dust in the bed	24.2	19.4
8-16c.	German cockroach allergens that exceed 0.1 unit per gram of dust in the bed	6.1	4.9

Target setting method: 20 percent improvement.

Data source: National Survey of Lead and Allergens in Housing, NIEHS, and U.S. Department of Housing and Urban Development.

Healthy People 2010 Objectives Related to Healthy Homes
Mid-Course Review – 2005

NO CHANGE IN OBJECTIVE

8-18. Increase the proportion of persons who live in homes tested for radon concentrations.

Target: 20 percent.

Baseline: 17 percent of the population lived in homes in 1998 that had been tested for radon (age adjusted to the year 2000 standard population).

Target setting method: Better than the best.

Data source: National Health Interview Survey (NHIS), CDC, NCHS.

NO CHANGE IN OBJECTIVE

8-19. Increase the number of new homes constructed to be radon resistant.

Target: 2.1 million additional new homes.

Baseline: 1.4 million new homes as of 1997.

Target setting method: 50 percent improvement.

Data source: National Association of Home Builders Research Center Survey, National Association of Home Builders.

NO CHANGE IN OBJECTIVE

8-22. Increase the proportion of persons living in pre-1950s housing that has been tested for the presence of lead-based paint.

Target: 50 percent.

Baseline: 16 percent of persons aged 18 years and older living in homes built before 1950 in 1998 reported that their homes had been tested for the presence of lead-based paint (age adjusted to the year 2000 standard population).

Target setting method: Better than the best.

Data source: National Health Interview Survey (NHIS), CDC, NCHS.

Healthy People 2010 Objectives Related to Healthy Homes
Mid-Course Review – 2005

REVISED OBJECTIVE

8-23. Reduce the proportion of occupied housing units that have moderate or severe physical problems.

Target: 3.1[1] percent.

Baseline: 6.5[2] percent of occupied U.S. housing units had moderate or severe physical problems in 1995.

Target setting method: 52 percent improvement.

Data source: American Housing Survey, U.S. Department of Commerce, Bureau of the Census.

[1] Target revised from 3.0 because of baseline revision after November 2000 publication.
[2] Baseline revised from 6.2 after November 2000 publication.

American Housing Survey - 2005
Selected Elements Related to Healthy Homes

Characteristics	Total Occupied Units	Owner	**Renter**	Const. < 4 Years	Manuf. Housing	**Severe Problems**	**Moderate Problems**	Moved in past year	**Below poverty level**	**In MSAs, Central Cities**	Urban Total	Rural Total
Total Occupied Units (,000)	108,871	74,931	33,940	5,944	6,940	2,021	4,176	18,882	15,124	31,783	81,259	27,613
GENERAL												
Owner occupied (,000)	74,931	74,931	**-**	4,919	5,516	**922**	**1,645**	6,591	**6,450**	**17,257**	51,909	23,022
Renter occupied (,000)	33,940	-	**33,940**	1,025	1,424	**1,099**	**2,531**	12,291	**8,674**	**14,526**	29,350	4,591
Owner occupied	69%	100%		83%	79%	**46%**	**39%**	35%	**43%**	**54%**	64%	83%
Renter occupied	31%		**100%**	17%	21%	**54%**	**61%**	65%	**57%**	**46%**	36%	17%
Units in Structure												
1, detached	64.3%	82.3%	**24.4%**	71.2%		**45.9%**	**41.4%**	41.4%	**43.6%**	**51.3%**	60.3%	76.1%
1, attached	5.7%	5.3%	**6.4%**	8.1%		**5.4%**	**2.8%**	6.9%	**5.6%**	**7.4%**	6.8%	2.2%
2 to 4	7.7%	2.1%	**20.1%**	3.4%		**12.6%**	**17.1%**	13.7%	**13.1%**	**12.5%**	9.5%	2.5%
5 to 9	4.7%	0.7%	**13.6%**	2.1%		**8.1%**	**9.7%**	9.9%	**8.4%**	**7.3%**	5.9%	1.2%
10 to 19	4.4%	0.8%	**12.3%**	3.4%		**8.5%**	**9.2%**	10.2%	**6.0%**	**6.4%**	5.5%	1.0%
20 to 49	3.3%	0.6%	**9.4%**	2.7%		**6.2%**	**7.3%**	6.4%	**5.4%**	**6.0%**	4.3%	0.4%
50 or more	3.6%	0.9%	**9.5%**	2.7%		**7.3%**	**5.5%**	5.0%	**7.9%**	**7.5%**	4.8%	0.2%
Manufactured / mobile home or trailer	6.4%	7.4%	**4.2%**	6.5%	100.0%	**6.0%**	**6.9%**	6.5%	**10.0%**	**1.7%**	3.0%	16.3%
Year Structure Built												
Post-2000	8.0%	9.4%	**4.8%**	100.0%	11.8%	**2.5%**	**2.4%**	14.5%	**5.1%**	**5.8%**	7.3%	10.0%
Post-1980	34.5%	37.7%	**27.4%**	100.0%	67.7%	**18.0%**	**18.3%**	40.6%	**26.3%**	**23.5%**	31.4%	43.4%
Pre-1980	65.5%	62.3%	**72.6%**	0.0%	32.3%	**82.0%**	**81.7%**	59.4%	**73.7%**	**76.5%**	68.6%	56.6%
Pre-1960	33.0%	31.5%	**36.4%**	0.0%	1.9%	**49.0%**	**48.5%**	28.2%	**37.0%**	**44.6%**	35.5%	25.9%
Pre-1940	16.2%	14.2%	**20.4%**	0.0%	0.7%	**27.7%**	**26.9%**	14.8%	**18.9%**	**23.8%**	16.5%	15.1%
Foundation												
1-unit building excluding manuf. housing	69.9%	87.6%	**30.9%**	79.3%	0.0%	**51.3%**	**44.3%**	48.3%	**49.2%**	**58.7%**	67.1%	78.3%
With basement under all of building	22.9%	30.2%	**7.0%**	23.4%	0.0%	**16.2%**	**6.8%**	12.6%	**13.7%**	**18.9%**	21.9%	26.0%
With basement under part of building	8.0%	10.5%	**2.6%**	3.8%	0.0%	**5.9%**	**3.2%**	4.4%	**4.0%**	**4.7%**	6.9%	11.3%
With crawlspace	17.5%	20.9%	**10.0%**	13.6%	0.0%	**17.5%**	**25.8%**	12.3%	**16.4%**	**14.4%**	14.9%	25.2%
On concrete slab	21.1%	25.8%	**10.9%**	38.1%	0.0%	**10.8%**	**8.2%**	18.7%	**14.7%**	**20.4%**	23.1%	15.3%

American Housing Survey - 2005
Selected Elements Related to Healthy Homes

Characteristics	Total Occupied Units	Owner	**Renter**	Const. < 4 Years	Manuf. Housing	**Severe Problems**	**Moderate Problems**	Moved in past year	**Below poverty level**	**In MSAs, Central Cities**	Urban Total	Rural Total
Total Occupied Units (,000)	108,871	74,931	33,940	5,944	6,940	2,021	4,176	18,882	15,124	31,783	81,259	27,613
EXTERIOR												
External Building Conditions												
Sagging roof	2.1%	1.8%	2.6%	0.5%	3.6%	**7.3%**	**7.6%**	2.0%	3.2%	2.1%	1.9%	2.4%
Missing roofing material	3.7%	3.2%	4.7%	2.0%	2.8%	**10.0%**	**8.4%**	3.8%	**5.4%**	4.2%	3.7%	3.5%
Hole in roof	1.8%	1.4%	2.8%	0.6%	2.7%	**7.3%**	**7.8%**	2.0%	3.2%	2.3%	1.9%	1.7%
Missing bricks, siding, other outside wall material	2.7%	2.1%	4.0%	0.7%	3.3%	**9.0%**	**9.7%**	3.1%	4.7%	3.1%	2.6%	3.0%
Sloping outside walls	1.3%	0.9%	2.1%	0.4%	2.4%	**6.2%**	**6.8%**	1.6%	2.4%	1.4%	1.3%	1.4%
Boarded up windows	0.9%	0.6%	1.6%	0.3%	1.3%	4.3%	**4.3%**	1.3%	2.3%	1.3%	0.9%	0.9%
Broken windows	3.5%	2.9%	4.8%	0.7%	**6.4%**	**10.1%**	**12.5%**	4.2%	**5.6%**	4.0%	3.3%	4.0%
Bars on windows	3.9%	2.7%	**6.4%**	0.5%	0.4%	**7.3%**	**8.6%**	3.8%	**6.1%**	**9.8%**	**5.0%**	0.5%
Foundation crumbling or has open crack or hole	2.3%	2.0%	3.0%	0.8%	1.5%	**7.5%**	**7.5%**	2.1%	3.7%	2.7%	2.3%	2.4%
None of the above	*81.8%*	*85.4%*	*74.0%*	*94.0%*	*81.6%*	*66.4%*	*58.6%*	*80.3%*	*73.4%*	*74.0%*	*80.7%*	*85.2%*
Water Leakage During Last 12 Months												
With leakage from outside structure	**10.7%**	**11.2%**	**9.8%**	**6.4%**	**12.3%**	**18.4%**	**27.4%**	**8.7%**	**10.1%**	**10.8%**	**10.5%**	**11.3%**
Roof	**5.4%**	**5.5%**	**5.1%**	2.2%	**8.5%**	**11.1%**	**16.5%**	4.1%	**5.8%**	**5.8%**	**5.2%**	**5.7%**
Basement	3.3%	4.0%	1.6%	1.4%	0.1%	3.7%	3.8%	2.0%	2.0%	2.7%	3.0%	4.1%
Walls, closed windows, or doors	2.2%	2.0%	2.7%	2.7%	3.4%	**6.3%**	**7.3%**	2.3%	2.6%	2.5%	2.4%	1.7%
Other or Unknown	1.2%	1.1%	1.4%	0.9%	1.5%	2.2%	4.0%	1.2%	1.0%	1.2%	1.2%	1.1%

American Housing Survey - 2005
Selected Elements Related to Healthy Homes

Characteristics	Total Occupied Units	Owner	**Renter**	Const. < 4 Years	Manuf. Housing	**Severe Problems**	**Moderate Problems**	Moved in past year	**Below poverty level**	**In MSAs, Central Cities**	Urban Total	Rural Total
Total Occupied Units (,000)	108,871	74,931	33,940	5,944	6,940	2,021	4,176	18,882	15,124	31,783	81,259	27,613
INTERIOR												
Damage												
Holes in floors	0.9%	0.7%	1.4%	0.3%	2.7%	5.4%	8.2%	1.0%	2.0%	1.1%	0.9%	1.0%
Open cracks or holes	4.8%	3.7%	7.2%	2.5%	7.3%	14.0%	29.0%	5.5%	7.5%	6.1%	4.9%	4.6%
Broken plaster or peeling paint	2.0%	1.4%	3.4%	0.5%	1.5%	7.5%	18.8%	2.1%	3.5%	3.1%	2.3%	1.3%
Water Leakage During Last 12 Months												
With leakage from inside structure	8.3%	7.0%	11.3%	5.5%	10.9%	15.9%	26.7%	10.4%	9.4%	9.3%	**8.8%**	**7.0%**
Fixtures backed up or overflowed	2.5%	2.1%	3.4%	1.9%	3.0%	6.6%	8.5%	3.5%	2.9%	2.9%	2.6%	2.1%
Pipes leaked	3.5%	2.6%	5.6%	2.2%	5.5%	8.5%	13.4%	4.8%	4.8%	4.3%	3.7%	2.9%
Broken water heater	0.9%	0.9%	0.7%	0.4%	1.7%	1.8%	2.3%	0.6%	0.8%	0.7%	0.9%	0.8%
Other or Unknown	2.1%	1.8%	2.8%	1.4%	1.6%	3.7%	6.3%	2.4%	2.0%	2.3%	2.2%	1.7%
Rodents												
Signs of rats in last 3 months	0.8%	0.6%	1.2%	0.2%	1.0%	4.1%	3.8%	0.7%	1.3%	1.3%	0.9%	0.5%
Signs of mice in last 3 months	5.6%	5.2%	6.5%	2.2%	10.0%	11.8%	12.1%	4.5%	7.2%	6.0%	4.6%	**8.7%**
Signs of rodents, not sure which kind in last 3 months	0.3%	0.2%	0.4%	0.1%	0.5%	0.9%	0.7%	0.4%	0.6%	0.4%	0.3%	0.2%
Electrical												
No electrical wiring	0.0%	0.1%	0.0%	0.1%	0.0%	1.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
Exposed wiring	0.6%	0.6%	0.7%	0.9%	0.9%	1.9%	1.5%	0.7%	1.1%	0.7%	0.6%	0.7%
Rooms without electric outlets	1.4%	1.2%	1.9%	1.2%	1.7%	4.8%	3.3%	2.1%	2.2%	1.8%	1.4%	1.3%
With fuses or breakers blown in last 3 months	**9.0%**	**8.9%**	**9.1%**	**8.4%**	**8.2%**	**17.6%**	**14.0%**	**10.8%**	**7.5%**	**9.6%**	**9.2%**	**8.4%**

American Housing Survey - 2005
Selected Elements Related to Healthy Homes

Characteristics	Total Occupied Units	Owner	**Renter**	Const. < 4 Years	Manuf. Housing	**Severe Problems**	**Moderate Problems**	Moved in past year	**Below poverty level**	**In MSAs, Central Cities**	Urban Total	Rural Total
Total Occupied Units (,000)	108,871	74,931	33,940	5,944	6,940	2,021	4,176	18,882	15,124	31,783	81,259	27,613
SANITATION/WATER												
Lacking complete kitchen facilities	1.6%	0.3%	4.2%	0.8%	0.6%	7.4%	**37.0%**	3.5%	3.2%	2.5%	1.9%	0.7%
Lacking some or all plumbing facilities	1.2%	0.9%	1.9%	0.2%	0.9%	**64.2%**	0.0%	1.5%	2.4%	1.7%	1.2%	1.1%
Water not safe to drink	**9.0%**	**7.0%**	**13.5%**	**8.0%**	**11.0%**	**13.9%**	**17.9%**	**12.2%**	**12.1%**	**11.3%**	**10.0%**	**6.2%**
With water stoppage in last 3 months	3.2%	2.6%	4.6%	2.1%	**7.1%**	**7.0%**	**7.7%**	3.9%	3.7%	3.5%	3.0%	3.9%
No flush toilets working some time in last 3 months	2.0%	1.1%	3.9%	1.1%	1.9%	**5.5%**	**10.0%**	3.7%	3.4%	2.5%	2.2%	1.4%
With sewage disposal breakdowns in last 3 months	1.2%	0.9%	1.6%	0.3%	1.5%	2.8%	4.3%	1.5%	1.4%	1.4%	1.2%	0.9%
Septic tank, cesspool, chemical toilet	20.2%	25.9%	7.6%	22.4%	54.8%	15.0%	16.7%	11.0%	16.3%	2.2%	5.6%	63.0%
With septic tank or cesspool breakdowns in last 3 months	1.3%	1.1%	2.5%	0.8%	0.9%	**5.0%**	3.7%	1.7%	1.8%	1.1%	1.8%	1.2%

American Housing Survey - 2005
Selected Elements Related to Healthy Homes

Characteristics	Total Occupied Units	Owner	**Renter**	Const. < 4 Years	Manuf. Housing	**Severe Problems**	**Moderate Problems**	Moved in past year	**Below poverty level**	**In MSAs, Central Cities**	Urban Total	Rural Total
Total Occupied Units (,000)	108,871	74,931	33,940	5,944	6,940	2,021	4,176	18,882	15,124	31,783	81,259	27,613
HEATING / FUEL												
Main Heating Equipment												
Warm air furnace	62.7%	67.3%	52.5%	74.0%	75.7%	46.5%	35.2%	61.9%	55.3%	60.8%	63.8%	59.4%
Steam or hot water system	11.8%	10.3%	15.2%	2.2%	0.2%	21.1%	11.6%	9.1%	12.6%	15.9%	13.0%	8.5%
Electric heat pump	11.5%	12.1%	10.1%	20.0%	13.5%	6.8%	5.7%	13.4%	9.7%	9.3%	10.3%	14.8%
Built-in electric units	4.3%	2.8%	7.6%	1.2%	1.1%	5.6%	5.6%	5.7%	5.9%	3.7%	3.9%	5.5%
Floor, wall, or other built-in hot air units without ducts	4.7%	2.9%	8.6%	1.5%	2.5%	6.8%	6.2%	5.7%	7.2%	6.4%	5.3%	2.8%
Room heaters with flue	1.2%	1.0%	1.6%	0.2%	1.2%	2.4%	1.4%	1.0%	2.1%	0.9%	0.9%	2.2%
Room heaters without flue	1.2%	1.2%	1.3%	0.0%	1.6%	2.7%	**30.5%**	0.9%	2.7%	1.1%	0.9%	2.2%
Portable electric heaters	0.8%	0.6%	1.4%	0.3%	1.9%	2.6%	1.7%	1.0%	1.9%	1.0%	0.8%	0.9%
Stoves	0.8%	1.0%	0.5%	0.3%	1.1%	2.5%	0.7%	0.2%	1.2%	0.1%	0.2%	2.7%
Fireplaces with inserts	0.1%	0.2%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.3%
Fireplaces without inserts	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Other	0.3%	0.2%	0.4%	0.2%	0.3%	0.7%	0.4%	0.4%	0.5%	0.3%	0.3%	0.3%
Cooking stove	0.1%	0.1%	0.2%	0.0%	0.2%	0.7%	0.2%	0.1%	0.2%	0.2%	0.1%	0.1%
None	0.4%	0.3%	0.6%	0.1%	0.5%	1.5%	0.8%	0.5%	0.6%	0.4%	0.4%	0.2%
Water Heating Fuel												
Electricity	39.4%	37.2%	44.1%	43.3%	72.9%	35.5%	39.8%	46.7%	45.8%	29.8%	32.6%	59.4%
Piped gas	51.5%	53.3%	47.6%	50.5%	18.6%	49.0%	50.5%	47.7%	45.4%	62.8%	60.9%	24.0%
Other	9.1%	9.4%	8.3%	6.2%	8.5%	15.5%	9.6%	5.6%	8.8%	7.3%	6.5%	16.6%
Clothes Dryer Fuel												
Electricity	77.1%	75.2%	85.5%	79.1%	92.0%	76.2%	82.7%	83.4%	83.5%	73.8%	72.6%	88.0%
Piped gas	21.4%	23.1%	13.8%	19.2%	5.8%	22.5%	16.2%	15.8%	14.9%	25.7%	26.8%	8.5%
Other	1.5%	1.6%	0.7%	1.7%	2.2%	1.3%	1.1%	0.9%	1.5%	0.5%	0.6%	3.6%
Heating Problems												
Uncomfortably cold for 24 hours or more last winter	**7.3%**	**5.9%**	**11.0%**	**5.5%**	**10.0%**	**40.6%**	**17.4%**	**10.0%**	**10.3%**	**9.0%**	**7.2%**	**7.5%**
Heating equipment breakdowns	2.4%	1.8%	4.0%	1.5%	2.2%	35.6%	2.9%	3.2%	3.1%	3.3%	2.6%	1.8%
Other causes	**5.1%**	4.2%	**7.3%**	4.1%	**8.0%**	**8.9%**	**15.0%**	**7.1%**	**7.6%**	**6.0%**	4.8%	**5.8%**
Utility interruption	1.5%	1.7%	1.1%	1.6%	3.2%	1.4%	1.9%	1.3%	1.4%	1.2%	1.1%	2.8%
Inadequate heating capacity	1.0%	0.5%	2.3%	0.5%	1.3%	3.2%	5.2%	1.7%	2.3%	1.5%	1.1%	0.7%
Inadequate insulation	0.9%	0.5%	1.8%	0.5%	1.9%	3.6%	3.9%	1.9%	2.0%	1.2%	0.9%	0.7%
Cost of heating	0.8%	0.7%	1.1%	0.5%	1.2%	1.4%	2.5%	1.1%	1.4%	0.8%	0.7%	0.9%
Other	1.5%	1.1%	2.4%	1.5%	1.3%	2.7%	4.8%	2.1%	2.1%	2.0%	1.6%	1.2%

American Housing Survey - 2005
Selected Elements Related to Healthy Homes

Characteristics	Total Occupied Units	Owner	**Renter**	Const. < 4 Years	Manuf. Housing	**Severe Problems**	**Moderate Problems**	Moved in past year	**Below poverty level**	**In MSAs, Central Cities**	Urban Total	Rural Total
Total Occupied Units (,000)	108,871	74,931	33,940	5,944	6,940	2,021	4,176	18,882	15,124	31,783	81,259	27,613
SELECTED PHYSICAL PROBLEMS												
Severe physical problems (,000)	**2,021**	**922**	**1,099**	**34**	**122**	**2,021**	**-**	**396**	**583**	**845**	**1,562**	**459**
Severe physical problems	**1.9%**	**1.2%**	**3.2%**	0.6%	**1.8%**			**2.1%**	**3.9%**	**2.7%**	**1.9%**	**1.7%**
Plumbing	**1.2%**	0.9%	**1.9%**	0.2%	0.9%	**64.2%**	0.0%	**1.5%**	**2.4%**	**1.7%**	**1.2%**	**1.1%**
Heating	0.6%	0.3%	**1.2%**	0.3%	0.8%	**31.8%**	0.0%	0.6%	**1.2%**	0.9%	0.6%	0.5%
Electric	0.1%	0.1%	0.1%	0.1%	0.0%	**3.6%**	0.0%	0.1%	0.2%	0.1%	0.0%	0.1%
Upkeep	0.0%	0.0%	0.1%	0.0%	0.1%	**2.6%**	0.0%	0.0%	0.2%	0.1%	0.1%	0.0%
Moderate physical problems (,000)	**4,175**	**1,645**	**2,531**	**65**	**287**	**-**	**4,175**	**1,065**	**1,131**	**1,659**	**3,217**	**959**
Moderate physical problems	**3.8%**	**2.2%**	**7.5%**	**1.1%**	**4.1%**			**5.6%**	**7.5%**	**5.2%**	**4.0%**	**3.5%**
Plumbing	0.1%	0.1%	0.3%	0.0%	0.2%	0.0%	3.7%	0.3%	0.3%	0.2%	0.2%	0.1%
Heating	1.2%	1.1%	1.2%	0.0%	1.6%	0.0%	**30.5%**	0.9%	2.5%	1.1%	0.9%	2.1%
Upkeep	1.1%	0.7%	2.0%	0.2%	2.0%	0.0%	**29.0%**	1.2%	2.0%	1.7%	1.2%	0.8%
Hallways	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	2.8%	0.2%	0.2%	0.2%	0.1%	0.0%
Kitchen	1.4%	0.3%	3.9%	0.8%	0.5%	0.0%	**37.0%**	3.2%	2.7%	2.2%	1.7%	0.5%
Overall Opinion of Structure												
1 (worst)	0.4%	0.2%	1.0%	0.1%	0.9%	3.4%	2.4%	0.7%	**13.3%**	0.7%	0.5%	0.4%
2	0.3%	0.2%	0.7%	0.1%	1.2%	1.4%	1.7%	0.6%	0.7%	0.5%	0.3%	0.3%
3	0.6%	0.3%	1.4%	0.2%	1.0%	1.9%	2.3%	1.0%	1.3%	1.0%	0.7%	0.5%
4	0.9%	0.4%	2.0%	0.2%	1.8%	2.9%	3.0%	1.4%	1.6%	1.3%	1.0%	0.7%
5	**5.1%**	3.3%	**9.1%**	2.1%	**9.3%**	**12.1%**	**12.8%**	**6.4%**	**8.6%**	**6.4%**	**5.2%**	**5.0%**
6	4.9%	3.6%	7.7%	2.3%	8.2%	8.1%	7.9%	6.2%	6.2%	5.8%	5.1%	4.3%
7	13.6%	11.6%	18.0%	8.6%	14.0%	15.1%	16.8%	16.8%	12.6%	15.4%	14.6%	10.6%
8	27.5%	27.9%	26.8%	21.8%	22.3%	20.5%	22.7%	28.5%	23.3%	27.9%	28.1%	25.7%
9	15.7%	17.6%	11.4%	20.2%	12.1%	11.7%	9.4%	13.3%	11.6%	14.3%	15.5%	16.0%
10 (best)	27.6%	31.4%	19.1%	42.6%	25.5%	20.1%	18.0%	22.4%	28.0%	23.1%	25.7%	33.1%

American Housing Survey:
A Healthy Homes Perspective

Overview

The survey is conducted by the Bureau of the Census for the Department of Housing and Urban Development (HUD). The results and details are available at www.census.gov/hhes/www/housing/ahs/ahs.html.

The American Housing Survey (AHS) collects data on the Nation's housing, including apartments, single-family homes, mobile homes, vacant housing units, household characteristics, income, housing and neighborhood quality, housing costs, equipment and fuels, size of housing unit, and recent movers. National data are collected in odd numbered years, and data for each of 47 selected Metropolitan Areas are collected currently about every six years. The national sample covers an average 55,000 housing units. Each metropolitan area sample covers 4,100 or more housing units.

The AHS returns to the same housing units year after year to gather data; therefore, this survey is ideal for analyzing the flow of households through housing.

Key Definitions Related to Healthy Homes

1. **Broken plaster or peeling paint (interior).** The area of peeling paint or broken plaster must be on the inside walls or ceilings and at least one area of broken plaster or peeling paint must be larger than 8 inches by 11 inches.
2. **Electric fuses and circuit breakers.** These statistics are presented for occupied housing units. The data show whether an electric fuse has blown or circuit breaker has tripped in the home in the 3 months prior to the interview, or while the household was living in the unit if less than 3 months. A blown fuse or tripped breaker switch results in the temporary loss of electricity until the fuse is replaced or the breaker switch reset. Blown fuses inside major pieces of installed equipment (such as some air conditioners) are counted as blown fuses or tripped breaker switches. The item may identify inadequate wiring, but it also happens commonly when people move into houses and are unfamiliar with which items can be turned on at the same time.
3. **Electric wiring.** A housing unit is classified as having exposed electric wiring if the unit has any wiring that is not enclosed, either in the walls or in metal or plastic coverings. Excluded are appliance cords, extension cords, chandelier cords, and telephone, antenna, or cable television wires.
4. **Electric wall outlets.** A housing unit is classified as having rooms without electric wall outlets if there is not at least one working electric wall outlet in each room of the unit. A working electric wall outlet is one that is in operating condition; that is, it can be used when needed. If a room does not have an electric wall outlet, an extension cord used in place of a wall outlet is not considered to be an electric wall outlet.
5. **Flush toilet and flush toilet breakdowns.** A privy or chemical toilet is not considered a flush toilet. Flush toilets outside the unit were not counted. The statistics on breakdowns of flush toilet are shown for housing units with at least one flush toilet for the household's use only. The flush toilet may be completely unusable because of a faulty flushing mechanism, broken pipes, stopped up sewer pipe, lack of water supplied to the flush toilet, or some other reason. For households with more than one toilet, the question asked about times when *all* toilets were unusable.
6. **Foundation.** This item is restricted to one-unit buildings and excludes mobile homes. A structure has a basement if there is an enclosed space at least partially underground in which a person can walk upright under all or part of the building. The basement is under all the building if it is under the entire main structure, excluding garages, car-ports, and porches. Crawl space is space between the ground and the first floor of the house, but it is not high enough for a person to walk upright. A house is built on a concrete slab

if it is built on concrete that has been poured on the ground. The ‘‘other’’ category refers to a house built on stilts or pilings (for example, beach houses), boats, and motor homes. housing unit is still too cold for the occupants. *Inadequate insulation* refers to air drafts through window frames, electrical outlets, or walls that are cold. *Cost of heating* refers to the occupants turning down their thermostat or turning the equipment off altogether to save money. This category includes utilities/fuels that are unavailable due to unpaid bills.

7. **Holes in floors.** Respondents were asked about holes in the interior floors of the unit. The holes may or may not go all the way through to a lower floor or to the exterior of the unit. The holes are only counted if large enough for someone to trip in.
8. **Light fixtures in public halls.** These statistics are presented for housing units in two-or-more-unit structures. Data include whether or not there are light fixtures in the public halls and whether or not some, none, or all of the light fixtures are in working order. Light fixtures include wall lights, ceiling lights, or table lamps in the public halls of the building. Public halls are used by the occupants and guests to get to their apartment doors.
9. **Open cracks or holes (interior).** Statistics are presented on open cracks or holes in the interior wall or ceilings of the housing unit. Included are cracks or holes that do not go all the way through to the next room or to the exterior of the housing unit. Hairline cracks or cracks that appear in the walls or ceilings but are not large enough to insert the edge of a dime, are not counted. Very small holes caused by nails or other similar objects are also not counted.
10. **Plumbing facilities.** The category ‘‘With all plumbing facilities’’ consists of housing units that have hot and cold piped water as well as a flush toilet and a bathtub or shower. For units with less than two full bathrooms, the facilities are only counted if they are for the exclusive use of the occupants of the unit. Plumbing facilities need not be in the same room. Lacking some plumbing facilities or having no plumbing facilities for exclusive use means that the housing unit does not have all three specified plumbing facilities (hot and cold piped water, flush toilet, and bathtub or shower) inside the housing unit, or that the toilet or bathing facilities are also for the use of the occupants of other housing units. See also the definitions ‘‘Complete bathrooms,’’ ‘‘Flush toilet and flush toilet breakdowns,’’ and ‘‘Sewage disposal and sewage disposal breakdowns.’’
11. **Signs of mice or rats.** The statistics on signs of mice or rats refer to respondents who reported seeing mice or rats or signs of mice or rats inside the house or building during the 3 months prior to interview or while the household was living in the unit if less than 3 months. Signs of mice or rats include droppings, holes in the wall, or ripped or torn food containers.
12. **Water leakage during last 12 months.** Data on water leakage are shown if the leakage occurred in the 12 months prior to the interview or while the household was living in the unit if less than 12 months. Housing units with water leakage are classified by whether the water leaked in from inside or outside the building and by the most common areas (roof, basement, walls, closed windows, or doors) or reasons (fixtures backed up or over-flowed or pipes leaked) of water leakage.
13. **Room heater without flue** refers to any room heater that burns kerosene, gas, or oil, and that does not connect to flue, vent, or chimney.

American Housing Survey:
A Healthy Homes Perspective

AHS's Rating System for Physical Problems

Physical Problems	Severe (any one of 5 categories)	Moderate (any one of 5 categories but none severe)
Plumbing	Lacking hot or cold piped water or a flush toilet, or lacking both bathtub and shower, all inside the structure (and for the exclusive use of the unit, unless there are two or more full bathrooms).	On at least three occasions during the last 3 months, all the flush toilets were broken down at the same time for 6 hours or more.
Heating	1. Having been uncomfortably cold last winter for 24 hours or more because the heating equipment broke down, and 2. It broke down at least three times last winter for at least 6 hours each time.	Having unvented gas, oil, or kerosene heaters as the primary heating equipment.
Electric / Kitchen	*Electric Physical Problems* 1. Having no electricity, or 2. All of the following three electric problems: a. Exposed wiring, b. A room with no working wall outlet, and c. Three blown fuses or tripped circuit breakers in the last 90 days.	*Kitchen Physical Problems* Lacking a: 1. Kitchen sink, 2. Refrigerator, or 3. Cooking equipment (stove, burners, or microwave oven) inside the structure for the exclusive use of the unit.
Hallways	Having all of the following four problems in public areas: 1. No working light fixtures. 2. Loose or missing steps. 3. Loose or missing railings. 4. No working elevator.	Having any three of the four problems listed under ''Physical problems—severe'' under Hallways.
Upkeep	Having any five of the following six maintenance problems: 1. Water leaks from the outside, such as from the roof, basement, windows, or doors. 2. Leaks from inside structure such as pipes or plumbing fixtures. 3. Holes in the floors. 4. Holes or open cracks in the walls or ceilings. 5. More than 8 inches by 11 inches of peeling paint or broken plaster. 6. Signs of rats in the last 90 days.	Having any three or four of the six problems listed under ''Physical problems—severe'' under Upkeep.

American Housing Survey:
A Healthy Homes Perspective

Potential Errors in American Housing Survey

All numbers from the American Housing Survey (AHS), except for sample size, are estimates. As in other surveys, errors come primarily from the following:

- **Incomplete data** – Incomplete data are adjusted by assuming that the respondents are similar to those not answering, and the size of these errors is estimated.
- **Wrong answers** – The U.S. Census Bureau does not adjust for wrong answers and does not estimate the size of the errors.
- **Sampling** – Sampling errors are not adjusted and the size of the error is estimated.

WRONG ANSWERS

Wrong answers happen because people misunderstand questions, cannot recall the correct answer, or do not want to give the right answer. The table below shows which items have been measured for inconsistency when people are reinterviewed after a few weeks. The actual survey did not catch and reconcile these inconsistencies and continuously occurring errors are not measured at all. Thus, a high rate of wrong answers remains for some items. The Census Bureau categorizes these levels of inconsistency into three ranges:

1. Less than 20 is considered a low level of inconsistency.
2. Between 20 and 50 is considered a moderate level of inconsistency.
3. Greater than 50 is considered a high level of inconsistency indicating that responses are not reliable.

Table Y. **Different Answers a Month Apart**

HIGH LEVEL OF INCONSISTENCY	
Other kinds of heating equipment (central warm-air)	91
Water came in from other places	81
Difficulty hearing with or without a hearing aid	72
Water safe for drinking	66
Other kinds of heating equipment (none)	63
Peeling paint on the ceiling	63
Other kinds of heating equipment (unvented room)	62
Electric fuses or breaker switches blown	58
Open cracks or holes in building	58
Other major repairs over $500 each—repair done	57
Central air conditioning/dehumidifier	56
Broken plaster or peeling paint	55
Water came in from walls, doors, windows	55
A working electric wall outlet	55
Other kinds of heating equipment (fireplace with no insert)	54
Broken plaster on the ceiling	53
Water came in from roof	53
Other major repairs over $500 each —someone in household did the work	51
Rate the place (10 categories)	51

MODERATE LEVEL OF INCONSISTENCY	
Holes in the floors	50
Other kinds of heating equipment (other built-in electric)	50
Central air fuel	50
Other kinds of heating equipment (portable electric)	47
Water came in from basement	45
Water leaked into home from outdoors	43
Other kinds of heating equipment (fireplace with insert)	43
Heat breakdown	41
Heating equipment broke down for 6 hours or more	41
Other kinds of heating equipment (stove)	36
LOW LEVEL OF INCONSISTENCY	
Heating equipment broke	18
Clothes dryer fuel	12
Source of water	8

Relationship Between Interior Problems and Exterior Problems

Based on the American Housing Survey - 2005 National Data for Occupied Housing

Exterior Problem	Homes (000s)	Likelihood of Finding an Interior Problem if an Exterior Problem is Reported Compared to the Likelihood of Finding an Interior Problem if an Exterior Problem is Not Reported*									
		Leaks		Rodents		Heating		Structural			Resident Dissatisfied
		From Interior	From Exterior	Rats	Mice	Heating Problem	Fire/CO Danger	Cracks in Walls	Holes in Floors	Paint/ plaster	
Sagging roof	2,234.8	2.2	3.3	6.7	3.2	2.8	3.5	5.6	11.7	6.5	8.5
Missing roofing material	3,995.6	1.8	2.8	3.9	2.1	2.4	2.3	3.5	5.9	4.4	4.5
Hole in roof	1,973.6	2.4	5.6	5.6	3.2	3.2	3.2	6.2	10.3	8.5	9.0
Sloping outside walls	1,415.8	2.5	2.9	7.4	3.4	3.7	4.5	6.3	14.0	9.0	10.5
Missing bricks, siding, other outside wall material	2,925.1	2.5	2.6	7.1	3.2	2.8	3.7	5.4	9.7	7.7	8.7
Broken windows	3,775.2	2.7	2.3	5.1	3.1	2.9	3.1	5.0	7.9	6.2	6.4
Boarded up windows	1,017.9	2.1	2.0	7.1	3.3	3.1	5.1	5.2	12.0	6.8	7.8
Foundation crumbling or has open crack or hole	2,510.6	2.4	3.3	5.3	3.2	3.4	2.3	6.3	10.0	6.6	7.8
One or more ext. problem	12,049.5	2.4	3.2	3.9	2.9	2.8	2.9	5.4	7.8	6.8	6.1
Two or more ext. problem	4,127.7	2.5	3.6	6.6	3.5	3.4	3.9	6.9	12.8	8.3	10.1
Three or more ext. problem	1,838.1	2.7	3.8	9.0	3.6	3.9	4.9	7.6	16.7	10.8	13.8
Four or more ext. problem	842.0	2.8	3.9	14.4	3.9	4.5	5.8	8.2	21.4	12.6	17.1
Five or more ext. problem	483.4	2.7	3.6	13.4	3.6	4.1	5.0	7.2	21.5	11.7	13.6
Six or more ext. problem	282.1	1.8	2.8	12.2	3.1	3.9	3.9	6.4	20.9	8.2	13.2
Seven or more ext. problem	152.6		2.0	12.6	2.5	3.5	4.0	4.8	15.8	7.4	12.6
Eight or more ext. problem	73.2			6.8					6.7		5.9

* A home is L times as likely to have a specific interior problem (column heading) if the exterior problem is reported (row heading) than if the exterior problem is not reported. For example, a home is 2.2 times as likely to have a leak from the interior if it has sloping outside walls than if the walls do not slope.

Relationship Between Interior Problems and Exterior Problems

The National Center for Healthy Housing developed the table to help communities make homes healthier by giving them a better understanding the direct relationship between exterior programs such as a sloping outside wall and interior problems such as rats, large holes in the floor, and water damage that can impact resident health and safety. With this understanding, communities can more effectively and efficiently identify homes with serious health and safety threats and set priorities for assessments of the interior. The table is based on the American Housing Survey (AHS). The AHS tracks some but not all items related to health. For example, it does not track cockroaches, radon, lead-based paint, and carbon monoxide levels.

Background on American Housing Survey

The American Housing Survey (AHS) is conducted by the Bureau of the Census for the Department of Housing and Urban Development (HUD) to describe the condition of the Nation's housing, including apartments, single-family homes, mobile homes, vacant housing units, household characteristics, income, housing and neighborhood quality, housing costs, equipment and fuels, size of housing unit, and recent movers. National data are collected in odd numbered years, and data for each of 47 selected Metropolitan Statistical Areas (MSA) are collected currently about every six years. The national sample covers an average 55,000 housing units. Each metropolitan area sample covers 4,100 or more housing units. The AHS returns to the same housing units year after year to gather data; therefore, this survey is ideal for analyzing the flow of households through housing. For more information, go to www.census.gov/hhes/www/housing/ahs/ahs.html.

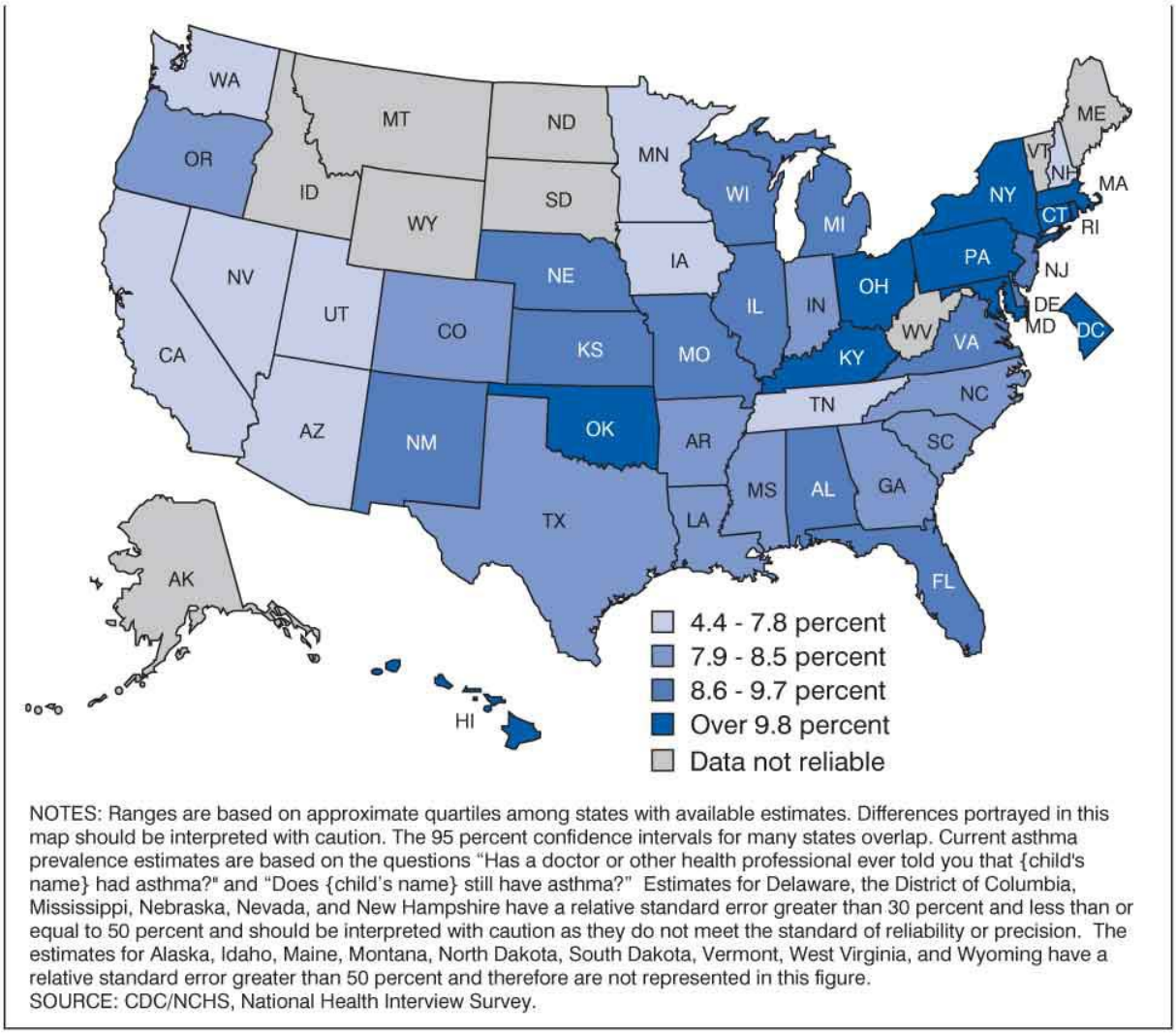
Key Definitions Related to Healthy Homes

- **Leaks – Interior or Exterior:** Resident reported leakage that occurred in the 12 months prior to the interview or while the household was living in the unit if less than 12 months. Housing units with water leakage are classified by whether the water leaked in from outside the building (roof, basement, walls, closed windows, or doors) or inside of the building (fixtures backed up or over-flowed or pipes leaked).
- **Rodents – Rats or Mice:** Resident reported mice or rats if they saw mice or rats or signs of mice or rats inside the house or building during the 3 months prior to interview or while the household was living in the unit if less than 3 months. Signs of mice or rats include droppings, holes in the wall, or ripped, or torn food containers.
- **Heating – Heating Problems:** Resident reported that the home was uncomfortably cold for 24 hours or more during the winter prior to the interview for any reason.
- **Heating – Fire / CO Danger:** Resident report using as primary heating source either room heater without flue (i.e., any room heater that burns kerosene, gas, or oil, and that does not connect to flue, vent, or chimney or a stove or oven for heat), portable electric heater, stove, cooking stove, fireplace without insert or no heat.
- **Structural – Cracks in Walls:** The resident report open cracks or holes in the interior wall or ceilings of the housing unit. Included are cracks or holes that do not go all the way through to the next room or to the exterior of the housing unit. Hairline cracks or cracks that appear in the walls or ceilings but are not large enough to insert the edge of a dime, are not counted. Very small holes caused by nails or other similar objects are also not counted.
- **Structural – Holes in Floors:** The resident reported holes in the interior floors of the unit. The holes may or may not go all the way through to a lower floor or to the exterior of the unit. The holes are only counted if large enough for someone to trip in.
- **Structural – Paint / Plaster:** The resident reported peeling paint or broken plaster. The area of peeling paint or broken plaster must be on the inside walls or ceilings and at least one area of broken plaster or peeling paint must be larger than 8 inches by 11 inches.
- **Resident Dissatisfied:** The resident rated structure based on a scale from 1 to 10, where 10 is the best and 1 is the worst. Resident is dissatisfied if the structure is rated 1, 2 or 3.

See www.healthyhomestraining.org/connections for more information

The State of Childhood Asthma, United States, 1980-2005, U.S. Centers for Disease Control and Prevention

Millions of children in the United States are affected by asthma, a chronic respiratory disease characterized by attacks of difficulty breathing. An asthma attack is a distressing and potentially life-threatening experience. Scientific advances have greatly improved the understanding of the mechanisms that cause asthma attacks and have led to effective medical interventions to prevent morbidity and improve quality of life. Yet, the burden in prevalence, health care use, and mortality remains high. Asthma remains a significant public health problem in the United States. See December 29, 2006 Revision at www.cdc.gov/nchs/data/ad/ad381.pdf



NOTES: Ranges are based on approximate quartiles among states with available estimates. Differences portrayed in this map should be interpreted with caution. The 95 percent confidence intervals for many states overlap. Current asthma prevalence estimates are based on the questions "Has a doctor or other health professional ever told you that {child's name} had asthma?" and "Does {child's name} still have asthma?" Estimates for Delaware, the District of Columbia, Mississippi, Nebraska, Nevada, and New Hampshire have a relative standard error greater than 30 percent and less than or equal to 50 percent and should be interpreted with caution as they do not meet the standard of reliability or precision. The estimates for Alaska, Idaho, Maine, Montana, North Dakota, South Dakota, Vermont, West Virginia, and Wyoming have a relative standard error greater than 50 percent and therefore are not represented in this figure.
SOURCE: CDC/NCHS, National Health Interview Survey.

Figure 1. Current asthma prevalence among children 0–17 years of age, by State, annual average for the period 2001–2005

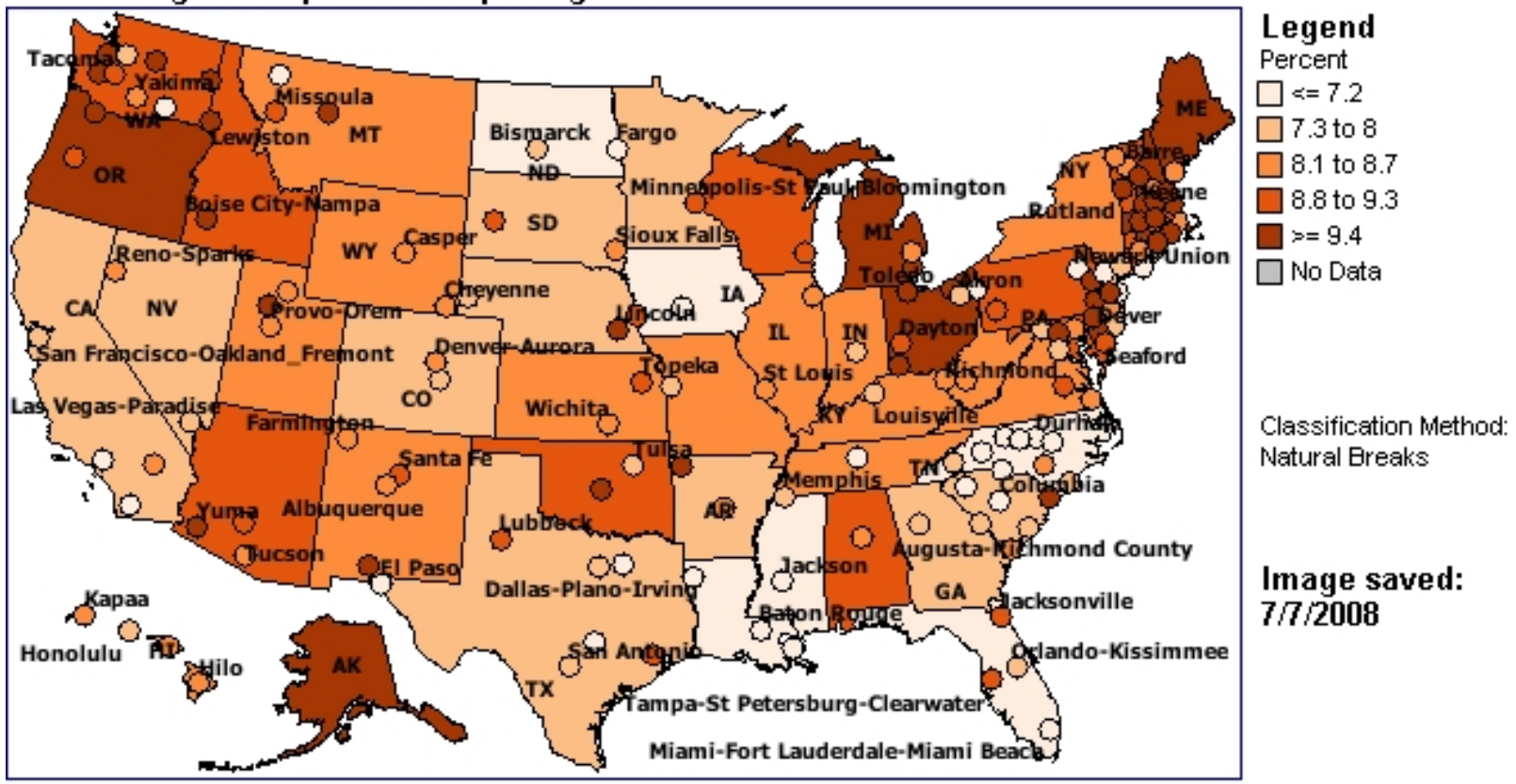
National Center for Chronic Disease Prevention and Health Promotion
Behavioral Risk Factor Surveillance System

BRFSS Maps

Year - 2006

Adults who have been told they currently have asthma

Percentage of respondents reporting Yes



Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2007. See http://apps.nccd.cdc.gov/gisbrfss/map.aspx

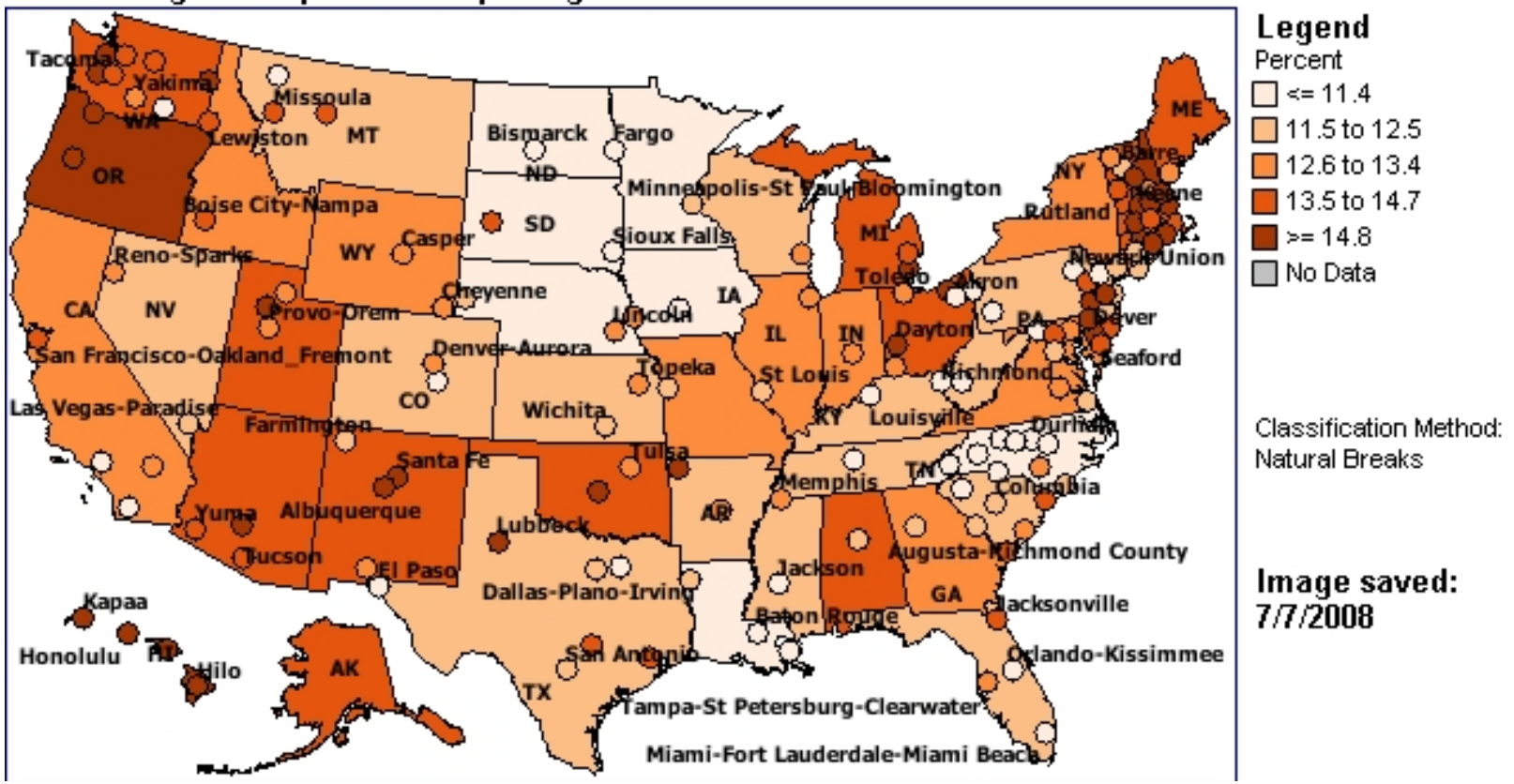
National Center for Chronic Disease Prevention and Health Promotion
Behavioral Risk Factor Surveillance System

BRFSS Maps

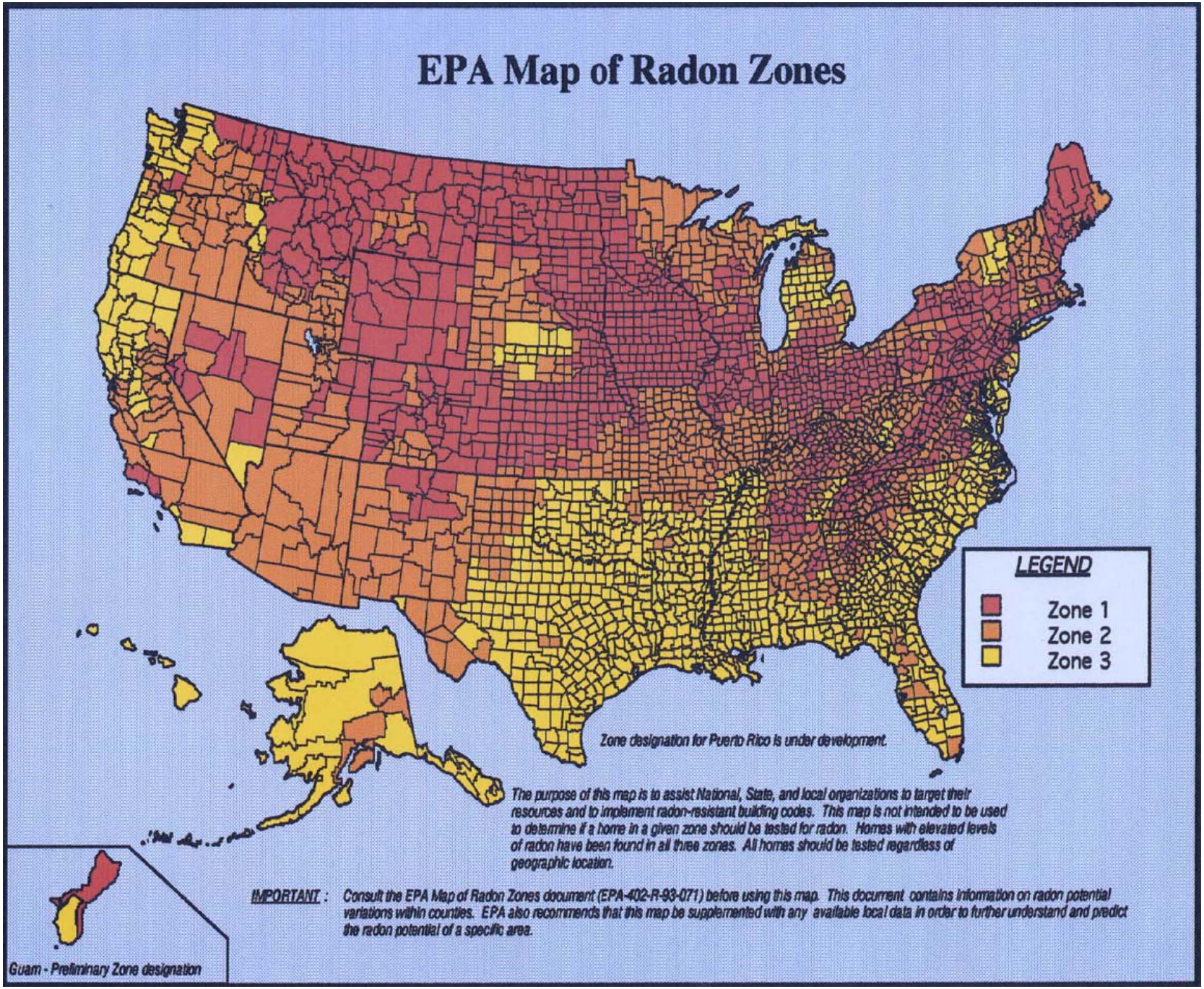
Year - 2006

Adults who have ever been told they have asthma

Percentage of respondents reporting Yes



Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2007. See http://apps.nccd.cdc.gov/gisbrfss/map.aspx


EPA Map of Radon Zones
LEGEND
Zone 1
Zone 2
Zone 3
Zone designation for Puerto Rico is under development.
The purpose of this map is to assist National, State, and local organizations to target their resources and to implement radon-resistant building codes. This map is not intended to be used to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones. All homes should be tested regardless of geographic location.
IMPORTANT : Consult the EPA Map of Radon Zones document (EPA-402-R-93-071) before using this map. This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.
Guam - Preliminary Zone designation

National Center for Healthy Housing

Laws, Rules and Codes for Healthier Homes: Review of Approaches Impacting Existing Homes

The National Center for Healthy Housing has identified five different, complementary regulatory approaches that have been used to make existing homes healthier and safer. This analysis focuses on regulatory approaches that address current conditions in existing homes. It does not address new construction or how rehabilitation must be conducted in existing homes.

1. **Housing/Property Maintenance Code:**
   The U.S. Department of Housing and Urban Development (HUD) sets standards for housing receiving federal assistance. For example, housing funded through Housing Choice Vouchers (formerly known as Tenant-Based Section 8 Voucher) must comply with Housing Quality Standards (HQS). See Part A on page 4 for more information on HQS. HUD also sets general standards for housing covered by mortgage insurance.

   For all other housing, there are no national codes for existing housing or property maintenance. HUD sets standards for the design and construction of manufactured housing and housing receiving federal assistance but does not regulate the maintenance of that housing.

   While all states have a code for new construction or major rehabilitation projects, few states have adopted standards mandating minimum conditions in or requiring maintenance of existing housing. In the absence of state standards, most urban and many suburban local jurisdictions adopted a housing or property maintenance code.

   The nation's model housing or property maintenance code is the International Property Maintenance Code (IPMC). The IPMC is managed by the International Code Council (ICC). Two states – New York and Virginia – and more than 600 local jurisdictions have adopted the IPMC with modifications. See Part B on page 9 for more information on the IPMC.

2. **Health/Sanitation Code:**
   There is no national health code for housing. State and local agencies – mostly in the Northeast – have adopted health or sanitation codes that address health and safety hazards in housing. Many urban areas have also adopted vector control programs generally focused on rodents and mosquito harborage.

   The leading example of a state health or sanitation code is the State Sanitary Code for the State of Massachusetts. The only model health or sanitation code was adopted by the American Public Health Association (APHA) in 1938 and has not been updated. The U.S. Centers for Disease Control and Prevention (CDC) used this model code as the foundation for its *Healthy Homes Reference Manual.* See Part C on page 14 for more information on the APHA model health/sanitation code.

3. **Landlord-Tenant Law:**
There is no national landlord-tenant law for rental housing. The Federal Lead Hazard Disclosure adopted by both the U.S. Environmental Protection Agency (EPA) and HUD requires landlords, sellers and their agents to disclose potential and known lead hazards in housing built before 1978. HUD also enforces the Fair Housing Law which requires reasonable accommodations for people with disabilities.

Most states and, in the absence of state action, many urban jurisdictions have adopted laws establishing minimum roles and responsibilities for landlords and tenants in rental housing. These codes typically require both parties to comply with the applicable health or housing code. The parties can enforce this requirement through the courts in a private civil suit.

The nation's model landlord-tenant law is the Uniform Residential Landlord and Tenant Act (URLTA) managed by the Uniform Law Commission. Twenty-one states have adopted URLTA. See Part D on page 19 for more information on the URLTA.

4. **Product Standards:**
The federal government is primarily responsible for setting standards for products in commerce that may impact health and safety. These standards reduce the dangers posed by these products by banning their use in housing, requiring safer designs, or specifying label requirements.

EPA regulates pesticides and does not allow them to be sold or used with prior approval. The Consumer Product Safety Commission (CPSC) regulates most other consumer products related to housing but requires only compliance with general requirements. In response to specific problems, CPSC adopts specific standards to address the problem such as banning lead containing paint. HUD sets standards for formaldehyde in wood in manufactured housing. The HUD label has been widely used as a voluntary standard beyond manufactured housing.

In addition, several national associations including the Underwriters Laboratories (UL), International Standards Organization (ISO), National Fire Protection Association (NFPA) and the American National Standards Institute (ANSI) adopt voluntary industry consensus standards.

States and local jurisdictions can set standards only when there are no federal standards or when their actions are consistent with or the same as federal standards. See Part E on page 23 for more information on these federal product standards.

5. **Hazard Management Laws:**
The federal, state and local government set a wide mix of requirements for the management of specific hazards in existing housing. EPA sets standards for asbestos, lead-based paint, and pesticides and has the authority to set standards for radon. HUD sets standards for lead-based paint in federally-assisted housing.

States and local jurisdictions set standards similar to or more stringent than the federal government. They also act in the absence of federal action such as requiring carbon monoxide alarms, requiring treatment of arsenic-treated lumber, or licensing mold or radon assessors or remediators. See Part F on page 25 for more information on federal hazard management laws. See Part G on page 28 for more information on EPA's Renovation, Repair and Painting Rule.

Table 1
Comparison of Regulatory Approaches to Healthy Homes

	Housing / Property Maintenance Code	Health / Sanitation Code	Landlord -Tenant Law	Product Standards	Hazard Management Law
National Requirements	Yes, for federally-assisted housing. No, for other housing.	No	Lead disclosure and fair housing	Yes, for specific products and general standards.	Yes for specific hazards such as lead, asbestos, and pesticides.
State Requirements	Several states	Several states	Most States	Yes, for pesticides. All must be consistent with federal.	Generally yes for specific hazards in addition to federal such as carbon monoxide and radon.
Local Requirements	Common except in rural areas	Common but limited scope	Common in large urban areas	Uncommon	Larger community for specific hazards in addition to federal and state.
Current National Models	Yes, International Property Maintenance Code (IPMC)	No	Yes, Uniform Residential Landlord and Tenant Act (URLTA)	Industry Consensus Standards	Federal government and some associations issue guidelines to address specific hazards.
For More Information	• Part A: Housing Quality Standards – Page 4 • Part B : IPMC – Page 9	• Part C: for American Public Health (APHA) Association 1938 Principles – Page 14	• Part D: URLTA – Page 19	• Part E – Page 23	• Part F – Page 25 • Part G: EPA's Renovation, Repair and Painting Rule – Page 27

A. HUD Housing Quality Standards

I. Overview

The U.S. Department of Housing and Urban Development (HUD) sets standards for housing receiving federal assistance. The primary standards are the Housing Quality Standards (HQS) at 24 CFR 982.401. The HQS were adopted in 1995 and last revised in 1999. All housing funded through HUD's Housing Choice Vouchers (formerly known as Tenant-Based Section 8 Voucher) must comply HQS as a condition of receiving funding. Local public housing authorities conduct initial and annual inspections to ensure compliance with the HQS.[1]

The HQS form the basis for HUD's Uniform Physical Condition Standards and it Public Housing Assessment System that applies to public housing and to Project-Based Section 8 Housing (also known as Housing Assistance Payment Program).[2]

II. HQS's Provisions

(a) Performance and acceptability requirements

(1) This section states the housing quality standards (HQS) for housing assisted in the programs.

(2)

(i) The HQS consist of:

(A) Performance requirements; and

(B) Acceptability criteria or HUD approved variations in the acceptability criteria.

(ii) This section states performance and acceptability criteria for these key aspects of housing quality:

(A) Sanitary facilities;
(B) Food preparation and refuse disposal;
(C) Space and security;
(D) Thermal environment;
(E) Illumination and electricity;
(F) Structure and materials;
(G) Interior air quality;
(H) Water supply;
(I) Lead-based paint;
(J) Access;
(K) Site and neighborhood;
(L) Sanitary condition; and
(M) Smoke detectors.

(3) All program housing must meet the HQS performance requirements both at commencement of assisted occupancy, and throughout the assisted tenancy.

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[1] See www.hud.gov/offices/pih/programs/hcv/about/fact_sheet.cfm for more information on the Housing Choice Voucher program.

[2] See www.hud.gov/offices/pih/programs/hcv/semap/semap.cfm for HUD's Section 8 Management Assessment Program.

(4)

(i) In addition to meeting HQS performance requirements, the housing must meet the acceptability criteria stated in this section, unless variations are approved by HUD.

(ii) HUD may approve acceptability criteria variations for the following purposes:

(A) Variations which apply standards in local housing codes or other codes adopted by the PHA; or

(B) Variations because of local climatic or geographic conditions.

(iii) Acceptability criteria variations may only be approved by HUD pursuant to paragraph (a)(4)(ii) of this section if such variations either:

(A) Meet or exceed the performance requirements; or

(B) Significantly expand affordable housing opportunities for families assisted under the program.

(iv) HUD will not approve any acceptability criteria variation if HUD believes that such variation is likely to adversely affect the health or safety of participant families, or severely restrict housing choice.

(b) Sanitary facilities

(1) *Performance requirements.* The dwelling unit must include sanitary facilities located in the unit. The sanitary facilities must be in proper operating condition, and adequate for personal cleanliness and the disposal of human waste. The sanitary facilities must be usable in privacy.

(2) *Acceptability criteria.*

(i) The bathroom must be located in a separate private room and have a flush toilet in proper operating condition.

(ii) The dwelling unit must have a fixed basin in proper operating condition, with a sink trap and hot and cold running water.

(iii) The dwelling unit must have a shower or a tub in proper operating condition with hot and cold running water.

(iv) The facilities must utilize an approvable public or private disposal system (including a locally approvable septic system).

(c) Food preparation and refuse disposal

(1) *Performance requirement.*

(i) The dwelling unit must have suitable space and equipment to store, prepare, and serve foods in a sanitary manner.

(ii) There must be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage where necessary (e.g, garbage cans).

(2) *Acceptability criteria.*

(i) The dwelling unit must have an oven, and a stove or range, and a refrigerator of appropriate size for the family. All of the equipment must be in proper operating condition. The equipment may be supplied by either the owner or the family. A microwave oven may be substituted for a tenant-supplied oven and stove or range. A microwave oven may be substituted for an owner-supplied oven and stove or range if the tenant agrees and microwave ovens are furnished instead of an oven and stove or range to both subsidized and unsubsidized tenants in the building or premises.

(ii) The dwelling unit must have a kitchen sink in proper operating condition, with a sink trap and hot and cold running water. The sink must drain into an approvable public or private system.

(iii)The dwelling unit must have space for the storage, preparation, and serving of food.

(iv)There must be facilities and services for the sanitary disposal of food waste and refuse, including temporary storage facilities where necessary (e.g., garbage cans).

(d) Space and security

(1) *Performance requirement.* The dwelling unit must provide adequate space and security for the family.

(2) *Acceptability criteria.*

(i) At a minimum, the dwelling unit must have a living room, a kitchen area, and a bathroom.

(ii) The dwelling unit must have at least one bedroom or living/sleeping room for each two persons. Children of opposite sex, other than very young children, may not be required to occupy the same bedroom or living/sleeping room.

(iii) Dwelling unit windows that are accessible from the outside, such as basement, first floor, and fire escape windows, must be lockable (such as window units with sash pins or sash locks, and combination windows with latches). Windows that are nailed shut are acceptable only if these windows are not needed for ventilation or as an alternate exit in case of fire.

(iv)The exterior doors of the dwelling unit must be lockable. Exterior doors are doors by which someone can enter or exit the dwelling unit.

(e) Thermal environment

(1) *Performance requirement.* The dwelling unit must have and be capable of maintaining a thermal environment healthy for the human body.

(2) *Acceptability criteria.*

(i) There must be a safe system for heating the dwelling unit (and a safe cooling system, where present). The system must be in proper operating condition. The system must be able to provide adequate heat (and cooling, if applicable), either directly or indirectly, to each room, in order to assure a healthy living environment appropriate to the climate.

(ii) The dwelling unit must not contain unvented room heaters that burn gas, oil, or kerosene. Electric heaters are acceptable.

(f) Illumination and electricity

(1) *Performance requirement.* Each room must have adequate natural or artificial illumination to permit normal indoor activities and to support the health and safety of occupants. The dwelling unit must have sufficient electrical sources so occupants can use essential electrical appliances. The electrical fixtures and wiring must ensure safety from fire.

(2) *Acceptability criteria.*

(i) There must be at least one window in the living room and in each sleeping room.

(ii) The kitchen area and the bathroom must have a permanent ceiling or wall light fixture in proper operating condition. The kitchen area must also have at least one electrical outlet in proper operating condition.

(iii)The living room and each bedroom must have at least two electrical outlets in proper operating condition. Permanent overhead or wall-mounted light fixtures may count as one of the required electrical outlets.

(g) Structure and materials

(1) *Performance requirement.* The dwelling unit must be structurally sound. The structure must not present any threat to the health and safety of the occupants and must protect the occupants from the environment.

(2) *Acceptability criteria.*

(i) Ceilings, walls, and floors must not have any serious defects such as severe bulging or leaning, large holes, loose surface materials, severe buckling, missing parts, or other serious damage.

(ii) The roof must be structurally sound and weathertight.

(iii) The exterior wall structure and surface must not have any serious defects such as serious leaning, buckling, sagging, large holes, or defects that may result in air infiltration or vermin infestation.

(iv) The condition and equipment of interior and exterior stairs, halls, porches, walkways, etc., must not present a danger of tripping and falling. For example, broken or missing steps or loose boards are unacceptable.

(v) Elevators must be working and safe.

(h) Interior air quality

(1) *Performance requirement.* The dwelling unit must be free of pollutants in the air at levels that threaten the health of the occupants.

(2) *Acceptability criteria.*

(i) The dwelling unit must be free from dangerous levels of air pollution from carbon monoxide, sewer gas, fuel gas, dust, and other harmful pollutants.

(ii) There must be adequate air circulation in the dwelling unit.

(iii) Bathroom areas must have one openable window or other adequate exhaust ventilation.

(iv) Any room used for sleeping must have at least one window. If the window is designed to be openable, the window must work.

(i) Water supply

(1) *Performance requirement.* The water supply must be free from contamination.

(2) *Acceptability criteria.* The dwelling unit must be served by an approvable public or private water supply that is sanitary and free from contamination.

(j) Lead-based paint performance requirement

The Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821–4846), the Residential Lead-Based Paint Hazard Reduction Act of 1992 (42 U.S.C. 4851–4856), and implementing regulations at part 35, subparts A, B, M, and R of this title apply to units assisted under this part.

(k) Access performance requirement

The dwelling unit must be able to be used and maintained without unauthorized use of other private properties. The building must provide an alternate means of exit in case of fire (such as fire stairs or egress through windows).

(l) Site and Neighborhood

(1) *Performance requirement.* The site and neighborhood must be reasonably free from disturbing noises and reverberations and other dangers to the health, safety, and general welfare of the occupants.

(2) *Acceptability criteria.* The site and neighborhood may not be subject to serious adverse environmental conditions, natural or manmade, such as dangerous walks or steps; instability; flooding, poor drainage, septic tank back-ups or sewage hazards; mudslides; abnormal air pollution, smoke or dust; excessive noise, vibration or vehicular traffic; excessive accumulations of trash; vermin or rodent infestation; or fire hazards.

(m) Sanitary condition—

(1) *Performance requirement.* The dwelling unit and its equipment must be in sanitary condition.

(2) *Acceptability criteria.* The dwelling unit and its equipment must be free of vermin and rodent infestation.

(n) Smoke detectors performance requirement—

(1) Except as provided in paragraph (n)(2) of this section, each dwelling unit must have at least one battery-operated or hard-wired smoke detector, in proper operating condition, on each level of the dwelling unit, including basements but excepting crawl spaces and unfinished attics. Smoke detectors must be installed in accordance with and meet the requirements of the National Fire Protection Association Standard (NFPA) 74 (or its successor standards). If the dwelling unit is occupied by any hearing-impaired person, smoke detectors must have an alarm system, designed for hearing-impaired persons as specified in NFPA 74 (or successor standards).

(2) For units assisted prior to April 24, 1993, owners who installed battery-operated or hard-wired smoke detectors prior to April 24, 1993 in compliance with HUD's smoke detector requirements, including the regulations published on July 30, 1992, (57 FR 33846), will not be required subsequently to comply with any additional requirements mandated by NFPA 74 (i.e., the owner would not be required to install a smoke detector in a basement not used for living purposes, nor would the owner be required to change the location of the smoke detectors that have already been installed on the other floors of the unit).

B. International Property Maintenance Code

I. Overview

The International Code Council[3] (ICC) published the first edition of the *International Property Maintenance Code* in 1998. ICC's three charter members of the International Code Council – Building Officials and Code Administrators International, Inc. (BOCA), International Conference of Building Officials (ICBO) and Southern Building Code Congress International (SBCCI) – developed the IPMC as a comprehensive set of regulations for existing buildings that was consistent with the existing model property maintenance codes at the time.. A new edition is promulgated every three years.

The *International Property Maintenance Code* is founded on principles that the IPMC must:
1. Adequately protect public health, safety and welfare;
2. Not unnecessarily increase construction costs;
3. Not restrict the use of new materials, productions or methods of construction; and
4. Not give preferential treatment to particular types or classes of materials, products or methods of construction.

Adoption

The *International Property Maintenance Code* is available for adoption and use by jurisdictions internationally. Its use within a governmental jurisdiction is intended to be accomplished through adoption by reference. At the time of adoption, jurisdictions should insert the appropriate information in provisions requiring specific local information, such as the name of the adopting jurisdiction. These locations are shown in bracketed words in small capital letters in the code and in the sample ordinance.

To find out whether the *International Property Maintenance Code* or any of the other ICC Codes have been adopted in your community, go to www.iccsafe.org/government/adoption.html.

Maintenance

The *International Property Maintenance Code* is kept up to date through the reviewof proposed changes submitted by code enforcing officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate. The contents of the code are subject to change both through the Code Development Cycles and the governmental body that enacts the code into law. For more information regarding the code development process, contact the Code and Standard Development Department of the International Code Council.

While the development procedure of the *International Property Maintenance Code* assures the highest degree of care, ICC and the founding members of ICC—BOCA, ICBO, SBCCI—their members and those participating in the development of the code do not accept any liability resulting from compliance or noncompliance with the provisions because ICC and its founding members do not have the power or authority to police or enforce compliance with the contents of the code. Only the governmental body that enacts the code into law has such authority.

[3] www.iccsafe.org.

Relationship to Other ICC Codes

The *International Property Maintenance Code* is complements and is fully compatible with all the *International Codes* ("I-Codes") published by the International Code Council (ICC), including the:

1. International Building Code;
2. ICC Electrical Code;
3. International Energy Conservation Code;
4. International Existing Building Code;
5. International Fire Code;
6. International Fuel Gas Code;
7. International Mechanical Code;
8. ICC Performance Code;
9. International Plumbing Code;
10. International Private Sewage Disposal Code;
11. International Residential Code;
12. International Urban-Wildland Interface Code; and
13. International Zoning Code.

All but three other states have adopted one or more of these model codes – most likely the International Building Code.

II. IPMC's Provisions Related to Healthy Homes

EXTERMINATION. The control and elimination of insects, rats or other pests by eliminating their harborage places; by removing or making inaccessible materials that serve as their food; by poison spraying, fumigating, trapping or by any other approved pest elimination methods.

HABITABLE SPACE. Space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces, and similar areas are not considered habitable spaces.

INFESTATION. The presence, within or contiguous to, a structure or premises of insects, rats, vermin or other pests.

302.1 Sanitation. All exterior property and premises shall be maintained in a clean, safe and sanitary condition. The occupant shall keep that part of the exterior property which such occupant occupies or controls in a clean and sanitary condition.

302.2 Grading and drainage. All premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of stagnant water thereon, or within any structure located thereon.

302.5 Rodent harborage. All structures and exterior property shall be kept free from rodent harborage and infestation. Where rodents are found, they shall be promptly exterminated by approved processes which will not be injurious to human health. After extermination, proper precautions shall be taken to eliminate rodent harborage and prevent reinfestation.

304.2 Protective treatment. All exterior surfaces, including but not limited to, doors, door and window frames, cornices, porches, trim, balconies, decks and fences shall be maintained in good condition. Exterior wood surfaces, other than decay-resistant woods, shall be protected from the elements and decay by painting or other protective covering or treatment. Peeling, flaking and chipped paint shall be eliminated and surfaces repainted. All siding and masonry joints as well as those between the building envelope and the perimeter of windows, doors, and skylights shall be maintained weather resistant and water tight. All metal surfaces subject to rust or corrosion shall be coated to inhibit such rust and corrosion and all surfaces with rust or corrosion shall be stabilized and coated to inhibit future rust and corrosion. Oxidation stains shall be removed from exterior surfaces. Surfaces designed for stabilization by oxidation are exempt from this requirement.

304.5 Foundation walls. All foundation walls shall be maintained plumb and free from open cracks and breaks and shall be kept in such condition so as to prevent the entry of rodents and other pests.

304.6 Exterior walls. All exterior walls shall be free from holes, breaks, and loose or rotting materials; and maintained weatherproof and properly surface coated where required to prevent deterioration.

304.7 Roofs and drainage. The roof and flashing shall be sound, tight and not have defects that admit rain. Roof drainage shall be adequate to prevent dampness or deterioration in the walls or interior portion of the structure. Roof drains, gutters and downspouts shall be maintained in good repair and free from obstructions. Roofwater shall not be discharged in a manner that creates a public nuisance.

304.14 Insect screens. During the period from [DATE] to [DATE], every door, window and other outside opening required for ventilation of habitable rooms, food preparation areas, food service areas or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged or stored, shall be supplied with approved tightly fitting screens of not less than 16 mesh per inch (16 mesh per 25 mm) and every swinging door shall have a self-closing device in good working condition.

> **Exception:** Screens shall not be required where other approved means, such as air curtains or insect repellent fans, are employed.

304.17 Guards for basement windows. Every basement window that is openable shall be supplied with rodent shields, storm windows or other approved protection against the entry of rodents.

305.1 General. The interior of a structure and equipment therein shall be maintained in good repair, structurally sound and in a sanitary condition. Occupants shall keep that part of the structure which they occupy or control in a clean and sanitary condition. Every owner of a structure containing a rooming house, housekeeping units, a hotel, a dormitory, two or more dwelling units or two or more nonresidential occupancies, shall maintain, in a clean and sanitary condition, the shared or public areas of the structure and exterior property.

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected.

307.1 Accumulation of rubbish or garbage. All exterior property and premises, and the interior of every structure, shall be free from any accumulation of rubbish or garbage.

308.1 Infestation. All structures shall be kept free from insect and rodent infestation. All structures in which insects or rodents are found shall be promptly exterminated by approved processes that will not be injurious to human health. After extermination, proper precautions shall be taken to prevent reinfestation.

308.2 Owner. The owner of any structure shall be responsible for extermination within the structure prior to renting or leasing the structure.

308.3 Single occupant. The occupant of a one-family dwelling or of a single-tenant nonresidential structure shall be responsible for extermination on the premises.

308.4 Multiple occupancy. The owner of a structure containing two or more dwelling units, a multiple occupancy, a rooming house or a nonresidential structure shall be responsible for extermination in the public or shared areas of the structure and exterior property. If infestation is caused by failure of an occupant to prevent such infestation in the area occupied, the occupant shall be responsible for extermination.

308.5 Occupant. The occupant of any structure shall be responsible for the continued rodent and pest-free condition of the structure.

> **Exception:** Where the infestations are caused by defects in the structure, the owner shall be responsible for extermination.

403.1 Habitable spaces. Every habitable space shall have at least one openable window. The total openable area of the window in every room shall be equal to at least 45 percent of the minimum glazed area required in Section 402.1.

> **Exception:** Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the unobstructed opening to the adjoining room shall be at least 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.33m2). The ventilation openings to the outdoors shall be based on a total floor area being ventilated.

403.2 Bathrooms and toilet rooms. Every bathroom and toilet room shall comply with the ventilation requirements for habitable spaces as required by Section 403.1, except that a window shall not be required in such spaces equipped with a mechanical ventilation system. Air exhausted by a mechanical ventilation system from a bathroom or toilet room shall discharge to the outdoors and shall not be recirculated.

403.4 Process ventilation. Where injurious, toxic, irritating or noxious fumes, gases, dusts or mists are generated, a local exhaust ventilation system shall be provided to remove the contaminating agent at the source. Air shall be exhausted to the exterior and not be recirculated to any space.

403.5 Clothes dryer exhaust. Clothes dryer exhaust systems shall be independent of all other systems and shall be exhausted in accordance with the manufacturer's instructions.

503.4 Floor surface. In other than dwelling units, every toilet room floor shall be maintained to be a smooth, hard, nonabsorbent surface to permit such floor to be easily kept in a clean and sanitary condition.

505.4 Water heating facilities. Water heating facilities shall be properly installed, maintained and capable of providing an adequate amount of water to be drawn at every required sink, lavatory, bathtub, shower and laundry facility at a temperature of not less than 110ºF (43ºC). A gas-burning water heater shall not be located in any bathroom, toilet room, bedroom or other occupied room normally kept closed, unless adequate combustion air is provided. An approved combination temperature and pressure-relief valve and relief valve discharge pipe shall be properly installed and maintained on water heaters.

602.2 Residential occupancies. Dwellings shall be provided with heating facilities capable of maintaining a room temperature of 68ºF (20ºC) in all habitable rooms, bathrooms and toilet rooms based on the winter outdoor design temperature for the locality indicated in Appendix D of the *International Plumbing Code*. Cooking appliances shall not be used to provide space heating to meet the requirements of this section.

> **Exception:** In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 65°F (18°C) shall be maintained.

602.3 Heat supply. Every owner and operator of any building who rents, leases or lets one or more dwelling unit, rooming unit, dormitory or guestroom on terms, either expressed or implied, to furnish heat to the occupants thereof shall supply heat during the period from [DATE] to [DATE] to maintain a temperature of not less than 68ºF (20ºC) in all habitable rooms, bathrooms, and toilet rooms.

> **Exceptions:**
> 1. When the outdoor temperature is below the winter outdoor design temperature for the locality, maintenance of the minimum room temperature shall not be required provided that the heating system is operating at its full design capacity. The winter outdoor design temperature for the locality shall be as indicated in Appendix D of the *International Plumbing Code*.
> 2. In areas where the average monthly temperature is above 30ºF (-1ºC) a minimum temperature of 65ºF (18ºC) shall be maintained.

603.2 Removal of combustion products. All fuel-burning equipment and appliances shall be connected to an approved chimney or vent.

> **Exception:** Fuel-burning equipment and appliances which are labeled for unvented operation.

603.5 Combustion air. A supply of air for complete combustion of the fuel and for ventilation of the space containing the fuel-burning equipment shall be provided for the fuel-burning equipment.

603.6 Energy conservation devices. Devices intended to reduce fuel consumption by attachment to a fuel-burning appliance, to the fuel supply line thereto, or to the vent outlet or vent piping therefrom, shall not be installed unless labeled for such purpose and the installation is specifically approved.

607.1 General. Duct systems shall be maintained free of obstructions and shall be capable of performing the required function.

C. APHA's Basic Principles of Healthful Housing

I. Overview

In 1938, the American Public Health Association[4] (APHA) formulated Basic Principles of Healthful Housing (Principles),[5] to promote the "physical, mental and social health" essential in housing. For each of the 30 Principles, APHA also identified Specific Requirements, and the Methods of Attainment considered at that time to be the "more important means" by which to achieve the Principle's objectives.

II. How The Principles Have Been Applied

The Principles continue to inform the dialogue about, and development of policies to promote, healthy housing. For example, U.S. federal agencies endorse the Principles in the *Healthy Housing Reference Manual* (*HH Manual*).[6] The CDC also modeled its original basic housing inspection manual after the Principles. In the U.K., the University of Warwick used the Principles as a foundational document in the development of the Health and Housing Rating System, the nation's housing inspection system. The Principles comport with modern tenets of healthy housing, *i.e.*: keep housing dry, clean, ventilated, and pest free; avoid contaminants; and properly maintain housing.

III. APHA's Principles

The 30 Principles fall into four categories:

a. **Fundamental Physiological Needs** (e.g., for illumination, heat, cooling, space, chemical purity, quiet);

b. **Fundamental Psychological Needs** (e.g., for privacy, adequate space, cleanliness, peace-of-mind, normal family and household activity);

c. **Protection Against Contagion** (e.g., from disease, vermin, sewage, contaminated water, over-crowding, food decay); and

d. **Protection Against Accidents** (e.g., from falls, fire, burns, gas, mechanical injuries, electrical shock, building collapse, traffic).

The Principles are summarized below, along with analysis excerpted from the *HH Manual*. The number of each Principle as identified in APHA's 1938 report is indicated by "P#."

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[4] www.apha.org.

[5] APHA, Committee on the Hygiene of Housing, *Basic Principles of Healthful Housing*, (Preliminary Report, March 1938). www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1529239 or www.ajph.org/cgi/reprint/28/3/351

[6] The manual is published by the U.S. Department of Health and Human Services and U.S. Department of Housing and Urban Development. www.cdc.gov/nceh/publications/books/housing/cha02.htm

Fundamental Physiological Needs (8 Principles[7])

1. A thermal environment to *avoid undue* heat loss (P1) -- and *permit adequate* heat loss (P2).

   The lack of adequate heating and cooling systems in homes can contribute to respiratory illnesses or even lead to death from extreme temperatures. . . . . [A] majority of today's homes [can] maintain healthy temperatures, although many houses still lack adequate insulation.

2. An atmosphere of "reasonable chemical purity" (P3).

3. Provision of:
   a. adequate *daylight* illumination and avoidance of undue daylight glare (P4);
   b. direct sunlight (P5); and
   c. adequate *artificia*l illumination and avoidance of glare (P6).

   Research has revealed a strong relationship between light and human physiology. . . . . one of the physiologic responses . . . is the production of vitamin D. . . . It affects body rhythms and psychologic health. . . . . Adequate lighting is important . . . to see unsanitary conditions and to prevent injury . . . Improper indoor lighting can also contribute to eyestrain . . . .

4. Protection against excessive noise (P7).

   Noise has physiologic impacts aside from the potential to reduce hearing ability. . . . elevated blood pressure; negative cardiovascular effects; increased breathing rates, digestion, and stomach disturbances; ulcers; negative effects on developing fetuses; difficulty sleeping after the noise stops; plus the intensification of the effects of drugs, alcohol, aging, and carbon monoxide. . . . [and cause other adverse effects].

5. Provision of adequate space for exercise and for the play of children (P8).

   Healthful housing should include the provision of safe play and exercise areas. Many American neighborhoods are severely deficient, with no area for children to safely play. . . . [no] sidewalks or street lighting, nor are essential services available by foot . . . .

Fundamental Psychological Needs (7 Principles)

6. Provision of:
   a. adequate privacy for the individual (P9);
   b. opportunities for normal family life (P10) – and normal community life (P11);
   c. facilities to make performing household tasks possible without undue physical and mental fatigue (P12);
   d. facilities for "the maintenance of cleanliness of the dwelling and the person" (P13); and
   e. "possibilities for reasonable esthetic satisfaction in the home and its surroundings" (P14).

7. "Concordance with prevailing social standards of the local community" (P15).

[7] The *HH Manual* adds a new Principle #1, "protection from the elements"; and does not discuss APHA Principle #3, "reasonable chemical purity."

Privacy is a necessity to most people . . . . Ideally, everyone would have their own rooms . . . excepting married couples and small children. . . . Bedrooms and bathrooms should be accessible directly from halls or living rooms . . . . crowding can lead to poor school performance in children."

A wholesome atmosphere requires adequate living room space and adequate space for withdrawal. . . . This . . . . includes easy communication with centers of culture and business . . . ."

Protection Against Contagion (8 Principles)

8. Provision of:
   a. A safe and sanitary water supply (P16);
   b. protection of the water supply system against pollution (P17); and
   c. toilet facilities that minimize the danger of transmitting disease (P18).

   [Approximately] 42 million Americans (mostly in rural America) get their water from private wells or other small, unregulated water systems. The presence of adequate water, sewer, and plumbing facilities is central to the prevention, reduction, and possible elimination of water-related diseases. . . . Water-related diseases can be organized into four categories:
   - Water*borne* diseases [*i.e.*, those caused by contamination from chemical, human, and animal wastes, such as cholera, typhoid, shigella, polio, meningitis, and hepatitis A and E].
   - Water-*based* diseases [*i.e.*, from aquatic organisms that become parasites. These are rare in the U.S.]
   - Water-*related vecto*r diseases [*i.e.*,, those linked to vectors that breed and live in/near water; primarily mosquitoes that carry malaria, yellow fever, *etc*. The West Nile virus is a vectorborne disease. In the U.S. in 2003, there were 9,862 human cases of West Nile virus, with 264 deaths.]
   - Water-*scarce* diseases [*i.e.*, diseases that flourish where sanitation is poor due to a scarcity of fresh water, including diphtheria, leprosy, tuberculosis. These conditions are essentially absent from the U.S.]

9. Protection against sewage contamination of interior surfaces (P19) – and avoidance of unsanitary conditions near the dwelling (P20).

   In 2000 . . . 1.4% of U.S. homes lacked plumbing facilities. . . . The containment of household sewage is instrumental in protecting the public from waterborne and vectorborne diseases. . . . .

   Nationally, 74.8% of homes are served by a public sewer, with 24.1% served by a septic tank or cesspool, and the remaining 1.1% using other means."

10. Exclusion of vermin which may play a part in the transmission of disease (P21).

    Vermin, such as rodents, have long been linked to property destruction and disease. Integrated pest management, along with proper housing construction, has played a significant role in reducing vermin around the modern home. Proper food storage, rat-proofing construction, and ensuring good sanitation outside the home have served to eliminate or reduce rodent problems in the 21st century home.

11. Provision of facilities for keeping milk and food fresh ("undecomposed")(P22).

Facilities to properly store milk and food [has] been instrumental in reducing . . . foodborne diseases . . . .

12. Provision of sufficient space in sleeping rooms to minimize the danger of infection (P23).

    Much improvement has been made in the adequacy of living space for the U.S. family over the last 30 years. . . . Excessive crowding in homes has the potential to increase. . . communicable disease transmission [and] the stress level of occupants . . . .

Protection Against Accidents (7 Principles)[8]

13. Erection of the dwelling with materials and methods to minimize danger of accidents due to collapse of any part of the structure (P24).

14. Control of conditions likely to *cause* fires or promote their spread (P25).

    Between 1992 and 2001, an average of 4,266 Americans died annually in fires and nearly 25,000 were injured. . . . . The [US] has one of the highest fire death rates in the industrialized world, with 13.4 deaths per million people. At least 80% of all fire deaths occur in residences. . . . . Apartment fires most often start in the kitchen . . . .

    Cooking is the leading cause of home fires, usually a result of unattended cooking and human error rather than mechanical failure of the cooking units. The leading cause of fire deaths in homes is careless smoking, which can be significantly deterred by smoke alarms and smolder-resistant bedding and upholstered furniture. . . .

    Manufactured homes can be susceptible to fires. More than one-fifth of residential fires in these facilities are related to the use of supplemental room heaters, such as wood- and coal-burning stoves, kerosene heaters, gas space-heaters, and electrical heaters. Most fires related to supplemental heating equipment "result from improper installation, maintenance, or use of the appliance."

15. Provision of adequate facilities for *escape* in the case of fire (P26).

    Three key elements can contribute to a safe exit from a home during the threat of fire. The first . . . is a working smoke alarm system. . . . By 1995, 93% of all single-family and multifamily homes, apartments, nursing homes, and dormitories were equipped with alarms. . . . .

    A second element . . . is a properly installed fire-suppression system. . . . . Currently, few homes are protected by residential sprinkler systems. . . . Sprinkler systems can be installed for a reasonable price. These systems can be retrofitted to existing construction . . .

    The final element in escaping from a residential fire is having a fire [escape] plan."

[8] The *HH Manual* does not discuss Principle # 24, dwelling construction, or # 30, traffic.

16. Protection against danger of electrical shocks and burns (P27).

    Electrical distribution equipment was the third-leading cause of home fires and the second-leading cause of fire deaths in the [U.S.] between 1994 and 1998. . . . . 38,300 home electrical fires occurred in 1998, which resulted in 284 deaths, [and] 1,184 injuries . . . .

    Electrical fires are one of the leading types of home fires in manufactured homes. . . . . [M]any electrical fires in homes are associated with improper installation of electrical devices by do-it-yourselfers."

17. Protection against gas poisonings (P28).

    In 2001 an estimated 130 deaths occurred as a result of CO poisoning from residential sources; this decrease in deaths [down from about 600 in 1998] is related to the increased use of CO detectors. In addition, approximately 10,000 cases of CO-related injuries occur each year.

18. Protection against falls and other mechanical injuries in the home (P29).

    The leading causes of home injury deaths in 1998 were falls and poisonings, which accounted for 6,756 and 5,758 deaths, respectively. . . . . Overall, falls were the leading cause of nonfatal, unintentional injuries occurring at home and accounted for 5.6 million injuries. . . . 48% of households have windows on the second floor or above, but only 25% have window locks or bars to prevent children from falling out. . . .

19. Protection of the neighborhood against automobile traffic hazards (P30).

D. Uniform Residential Landlord and Tenant Act

I. Overview

The Uniform Residential Landlord and Tenant Act (URLTA) was completed by the Uniform Law Commission (ULC) in 1972.[9]

The ULC Drafting Process
A "uniform" state law is one in which uniformity of the provisions of the act among the various jurisdictions is a principal and compelling objective. To draft an act, ULC appoints a drafting committee from among the ULC membership (attorneys from diverse practice areas). Each draft receives at least two years consideration. The drafting process draws on the expertise of state-appointed commissioners, legal experts, and advisors and observers representing the views of other legal organizations or interests that will be subject to the proposed laws.

Draft acts are submitted for initial debate of the entire ULC at an annual meeting. Each act must be considered section-by-section, at no less than two annual meetings, by all commissioners. Once approved, the final step is a vote by states. A majority of the states present, and no less than 20 states, must approve an act before it can be officially adopted.[10]

URLTA
URLTA establishes the landlord and tenant relationship on the basis of contract (rather than property law) and, thus, gives the parties contractual rights and remedies. As of 2008, URLTA has been adopted by 21 states[11]:

Alabama	Kansas	Oklahoma
Alaska	Kentucky	Oregon
Arizona	Michigan	Rhode Island
Connecticut	Mississippi	South Carolina
Florida	Montana	Tennessee
Hawaii	Nebraska	Virginia
Iowa	New Mexico	Washington

[9] *See* National Conference of Commissioners on Uniform State Laws (NCCUSL) at www.nccusl.org/Update/. NCCUSL's electronic archives is maintained by the University of Pennsylvania Law School at www.law.upenn.edu/bll/archives/ulc/ulc_final.htm#final.
[10] *See* www.nccusl.org/Update/DesktopDefault.aspx?tabindex=5&tabid=61.
[11] *See* www.nccusl.org/Update/uniformact_factsheets/uniformacts-fs-urlta.asp.

II. URLTA's Property Maintenance Obligations

URLTA is intended to "encourage landlords and tenants to maintain and improve the quality of housing," and clarify the "rights and obligations of landlords and tenants." URLTA § 1.102.

Landlord Obligations

Generally, URLTA requires that a landlord:

- comply with applicable building and housing codes affecting health and safety;
- "make all repairs and do whatever is necessary to put and keep the premises in a fit and habitable condition";
- keep all common areas in a clean and safe condition;
- maintain electrical, plumbing, sanitary, heating, ventilating, air-conditioning, and other facilities and appliances in "good and safe working order and condition";
- provide and maintain appropriate receptacles for removal of garbage and other waste, and arrange for their removal; and
- supply running water and reasonable amounts of hot water at all times and reasonable heat (between October 1 and May 1), except where the law does not require the building be so equipped, or heat or hot water is generated by an installation controlled by the tenant.

Under certain circumstances, a landlord and tenant may agree to have the tenant perform repairs and maintenance. URLTA § 2.104.

URLTA prohibits rental agreements that allow landlords to receive rent free of the obligation to comply with the code's maintenance obligations. URLTA § 1.404; § 2.104(a).

Tenant Obligations

Also, URLTA requires that a tenant:

- comply with all obligations primarily imposed upon tenants by applicable building and housing codes;
- keep the tenant's premises "as clean and safe as the condition of the premises permit";
- dispose of garbage, rubbish and other wastes from the dwelling unit "in a clean and safe manner";
- keep plumbing fixtures in the tenant's dwelling unit "as clear as their condition permits"; and
- use "in a reasonable manner" all electrical, plumbing, sanitary, heating, ventilating, air-conditioning, and other facilities and appliances. URLTA § 3.101.

III. URLTA Provisions Related to Property Maintenance[12]

§ 1.102. [Purposes; Rules of Construction]

(a) This Act shall be liberally construed and applied to promote its underlying purposes and policies.

(b) Underlying purposes and policies of this Act are

(1) to simplify, clarify, modernize, and revise the law governing the rental of dwelling units and the rights and obligations of landlords and tenants;

(2) to encourage landlords and tenants to maintain and improve the quality of housing; and

(3) to make uniform the law with respect to the subject of this Act among those states which enact it.

§ 1.404. [Separation of Rents and Obligations to Maintain Property Forbidden]

A rental agreement, assignment, conveyance, trust deed, or security instrument may not permit the receipt of rent free of the obligation to comply with Section 2.104(a).

§ 2.104. [Landlord to Maintain Premises]

(a) A landlord shall:

(1) Comply with the requirements of applicable building and housing codes materially affecting health and safety;

(2) Make all repairs and do whatever is necessary to put and keep the premises in a fit and habitable condition;

(3) Keep all common areas of the premises in a clean and safe condition;

(4) Maintain in good and safe working order and condition all electrical, plumbing, sanitary, heating, ventilating, air-conditioning, and other facilities and appliances, including elevators, supplied or required to be supplied by him;

(5) Provide and maintain appropriate receptacles and conveniences for the removal of ashes, garbage, rubbish, and other waste incidental to the occupancy of the dwelling unit and arrange for their removal; and

(6) Supply running water and reasonable amounts of hot water at all times and reasonable heat [between [October 1] and [May 1]] except where the building that includes the dwelling unit is not required by law to be equipped for that purpose, or the dwelling unit is so constructed that heat or hot water is generated by an installation within the exclusive control of the tenant and supplied by a direct public utility connection.

(b) If the duty imposed by paragraph (1) of subsection (a) is greater than any duty imposed by any other paragraph of that subsection, the landlord's duty shall be determined by reference to paragraph (1) of subsection (a).

(c) The landlord and tenant of a single family residence may agree in writing that the tenant perform the landlord's duties specified in paragraphs (5) and (6) of subsection (a) and also specified repairs, maintenance tasks, alterations, and remodeling, but only if the transaction is entered into in good faith.

(d) The landlord and tenant of any dwelling unit other than a single family residence may agree that the tenant is to perform specified repairs, maintenance tasks, alterations, or remodeling only if

[12] See www.law.upenn.edu/bll/archives/ulc/fnact99/1970s/urlta72.htm or www.law.upenn.edu/bll/archives/ulc/ulc_final.htm#final.

(1) The agreement of the parties is entered into in good faith and is set forth in a separate writing signed by the parties and supported by adequate consideration;
(2) The work is not necessary to cure noncompliance with subsection (a)(1) of this section; and
(3) The agreement does not diminish or affect the obligation of the landlord to other tenants in the premises.

(e) The landlord may not treat performance of the separate agreement described in subsection (d) as a condition to any obligation or performance of any rental agreement.

§ 3.101. [Tenant to Maintain Dwelling Unit]

A tenant shall:

(1) Comply with all obligations primarily imposed upon tenants by applicable provisions of building and housing codes materially affecting health and safety;
(2) Keep that part of the premises that he occupies and uses as clean and safe as the condition of the premises permit;
(3) Dispose from his dwelling unit all ashes, garbage, rubbish, and other waste in a clean and safe manner;
(4) Keep all plumbing fixtures in the dwelling unit or used by the tenant as clear as their condition permits;
(5) Use in a reasonable manner all electrical, plumbing, sanitary, heating, ventilating, air-conditioning, and other facilities and appliances including elevators in the premises;
(6) Not deliberately or negligently destroy, deface, damage, impair, or remove any part of the premises or knowingly permit any person to do so; and
(7) Conduct himself and require other persons on the premises with his consent to conduct themselves in a manner that will not disturb his neighbors' peaceful enjoyment of the premises.

E. Product Standards

I. Overview

The federal government is primarily responsible for setting standards for products in commerce that may impact health and safety. These standards reduce the dangers posed by these products by banning their use in housing, requiring safer designs, or specifying label requirements.

EPA regulates pesticides and does not allow them to be sold or used with prior approval. The Consumer Product Safety Commission (CPSC) regulates most other consumer products related to housing but requires only compliance with general requirements. In response to specific problems, CPSC adopts specific standards to address the problem such as banning lead containing paint. HUD sets standards for formaldehyde in wood in manufactured housing. The HUD label has been widely used as a voluntary standard beyond manufactured housing.

II. EPA Pesticide Registration

The U.S. Environmental Protection Agency sets product standards for pesticides.[13] A pesticide is broadly defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests are living organisms that occur where they are not wanted or that cause damage to crops or humans or other animals. Therefore, a pesticide includes herbicides, insecticides, and fungicides. Products which contain certain low-risk ingredients, such as garlic and mint oil, have been exempted from Federal registration requirements, although State regulatory requirements may still apply.

No pesticide can be sold without first being registered by EPA pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). For a pesticide to be registered, EPA must affirmatively determine that the product does not pose an unreasonable risk to human health and the environment when used consistent with the label. The label becomes the law that must be followed when used the pesticide. Anyone, even a consumer, who does not follow the product label are violating the law.

Through the registration process, EPA can restrict the sale or use of a pesticide including its use in housing. It can require that only licensed pest control operators use the pesticides by classifying it as a "restricted use" pesticide. During the past few years, EPA has removed once common pesticides such as chlorpyrifos[14] and diazinon[15] from consumer use and restricted access to the products.

In May 2008, EPA took the unusual step of limiting the use and sale of rodenticides because of pervasive misuse.[16] More than 3000 children required treatment for accidental exposure to a type of rodenticide that acts as an anticoagulant in mammals. These second generation anticoagulants kill rodents with just one feeding and persist in body tissues. EPA required that all rodenticide bait products be sold to consumers only in tamper resistant bait stations. Loose bait such as pellets would be prohibited.

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[13] See www.epa.gov/pesticides.
[14] See www.epa.gov/pesticides/reregistration/REDs/factsheets/chlorpyrifos_fs.htm
[15] See www.epa.gov/pesticides/reregistration/diazinon/
[16] See www.epa.gov/opp00001/reregistration/rodenticides/

See www.epa.gov/pesticides for more information.

III. CPSC Hazardous Substances Laws

The Consumer Product Safety Commission sets product standards pursuant to the Consumer Product Safety Act and the Federal Hazardous Substance Act.[17] The CPSC has adopted mandatory products standards for the following items related to housing, furniture, and appliances:

- Safety standard for walk-behind power lawn mowers: 16 CFR Part 1205
- Safety standard for swimming pool slides: 16 CFR Part 1207
- Safety standard for automatic residential garage door operators: 16 CFR Part 1211
- Safety standard for entrapment hazards in bunk beds: 16 CFR Part 1213
- Ban of unstable refuse bins: 16 CFR Part 1301
- Ban of extremely flammable contact adhesives: 16 CFR Part 1302
- Ban of lead-containing paint and certain consumer products bearing lead-containing paint: 16 CFR Part 1303
- Ban of consumer patching compounds containing respirable free-form asbestos: 16 CFR Part 1304
- Ban of artificial emberizing materials (ash and embers) containing respirable free-form asbestos: 16 CFR Part 1305
- Self pressurized consumer products containing chlorofluorocarbons: 16 CFR Part 1401
- CB base station antennas, TV antennas, and supporting structures: 16 CFR Part 1402
- Cellulose insulation: 16 CFR Part 1404
- Coal and wood burning appliances--notification of performance and technical data: 16 CFR Part 1406
- Requirements for full-size baby cribs: 16 CFR Part 1508
- Requirements for non-full-size baby cribs: 16 CFR Part 1509
- Requirements for bunk beds: 16 CFR Part 1513
- Standard for the flammability of vinyl plastic film 16 CFR Part 1611
- Standard for the surface flammability of carpets and rugs (FF 1-70) 16 CFR Part 1631
- Standard for the surface flammability of small carpets and rugs (FF 2-70) 16 CFR Part 1631
- Standard for the flammability of mattresses and mattress pads (FF 4-72, amended) 16 CFR Part 1632
- Standard for the flammability (open flame) of mattress sets (Eff. 7-1-07) 16 CFR Part 1633
- Standard for devices to permit the opening of household refrigerator doors from the inside16 CFR Part 1750

For a complete list sorted by product, go to www.cpsc.gov/businfo/reg1.html.

It also requires labeling of products and bans products containing hazardous substances if they could injure a child.

See www.cpsc.gov for more information.

[17] See www.cpsc.gov.

F. Hazard Management Laws

The U.S. Environmental Protection Agency (EPA) has promulgated regulations to govern asbestos, lead-based paint (LBP), and pesticide use (as well as manufacture and sale). EPA also possesses, but has not exercised, rulemaking authority for radon.

I. Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP)[18]

The asbestos NESHAP[19] applies to residential buildings with more than four dwelling units (and to other buildings), and imposes requirements for handling Regulated Asbestos-Containing Material (RACM) during demolition and renovation projects. RACM includes *friable* asbestos material; and *non*-friable material that has, or likely will become, friable (*e.g.*, will be subject to sanding or grinding, or likely will be crumbled or pulverized).

The NESHAP requires that:

- Prior to demolition or renovation, a certified inspector must inspect all affected areas; and EPA must be notified ten (10) days prior to the start of work for:
  - any "demolition" (*i.e.*, removal of load bearing member or structure), *even if asbestos may not be present*, and
  - any "renovation" that involves removal or disturbance of >260 linear feet or 160 ft^2 of RACM.
- Certified workers remove all RACM, a certified supervisor be present, and required work practices be followed (*e.g.*, wet methods, and no visible emissions).
- The collection, transport, and disposal of waste comport with regulatory requirements.

II. Lead-based Paint (LBP)

The federal government has several legal authorities pertaining to LBP and LBP hazards:

- The Disclosure Rule[20,21];
- The Lead Safe Housing Rule (LSH Rule)[22];
- The Toxic Substances Control Act (TSCA), and regulations thereunder:
  - The Pre-renovation Education Rule (PRE Rule);
  - The Renovation, Repair and Painting Rule (RRP Rule) (issued by EPA on April 22, 2008 and fully effective on April 22, 2010); and
  - The Lead-based Paint Activities, Certification and Training Rule (LBP Activities Rule);[23] and
- The Resource Conservation and Recovery Act (RCRA) Section 7003.[24]

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[18] *NESHAP Fact Sheet for Renovation and Demolition Projects*. http://yosemite.epa.gov/R10/OWCM.NSF/webpage/Asbestos+in+Demolition+and+Renovation.
[19] 40 C.F.R. Part 61, Subpart M.
[20] 24 C.F.R. Part 35, Subpart A (HUD) and 40 C.F.R. Part 745, Subpart F (EPA).
[21] 42 U.S.C. §§ 4851-4853a (known also as the Residential Lead-based Paint Hazard Reduction Act of 1992).
[22] 24 C.F.R. Part 35, Subparts B-R. The U.S. Department of Housing and Urban Development (HUD) administers and enforces the LSH Rule.
[23] 15 U.S.C. §§ 2601-2692; 40 C.F.R. Part 745, Subparts E and L.
[24] 42 U.S.C. § 6973.

Generally, these laws establish disclosure obligations, and performance standards for activities that disturb LBP – but do *not* impose an affirmative obligation to perform LBP risk reduction work and do *not* empower federal authorities to demand such work. There are two exceptions:

- The LSH Rule applies to federally owned or assisted pre-1978 housing (approximately 3 percent of pre-1978 housing). The rule requires disclosure, and various evaluation and risk reduction measures based upon the classification of the housing, as determined by the level of federal assistance, age of housing, ownership, and other factors.
- RCRA Section 7003 empowers EPA to order a responsible person to take action "as may be necessary" to protect human health and the environment when a "solid waste," including a LBP hazard, presents an "imminent and substantial endangerment."

See Part G for more information on EPA's Renovation, Repair and Painting Rule.

III. Pesticide Use

Integrated Pest Management (IPM)[25]

EPA promotes the use of IPM in residential settings, through outreach and education, and its Pesticide Environmental Stewardship Program (PESP). [26]

IPM is a *series* of pest management evaluations, decisions and controls, generally using a four-tiered approach in the following sequence:

- Set Action Thresholds, *i.e.*, decide the point at which pest populations or environmental conditions indicate that pest control action is required;
- Monitor and Identify Pests, *i.e.*, ensure that pesticides are really needed, and that the correct pesticide will be used;
- Prevention, *i.e.*, manage the indoor space to prevent pests from becoming a threat; and
- Control, *i.e.*, use less risky pest controls first (*e.g.*, highly targeted chemicals, such as pheromones) or mechanical control (*e.g.*, trapping); use additional methods if necessary (*e.g.*,, targeted spraying); use broadcast spraying of non-specific pesticides as a last resort.

Pesticide Labeling[27]

Pesticide labels constitute the law concerning the proper use of a pesticide. Failure to use a pesticide by a professional or by a consumer in accordance with the label requirements and prohibitions is a violation of the law and may be grounds for an enforcement action. To promote proper pesticide use by consumers, EPA employs outreach and education, and voluntary programs.[28]

The "Directions for Use" section of a label reflects EPA's "determination that the use of the product in such a manner does not cause unreasonable adverse effects on the environment." (Other sections explain the ingredients, effects, and other facts.) Generally, the Directions for Use section states the:

- Pest(s) the product may be used to control,
- Sites where the product may be used;

[25] *Integrated Pest Management (IPM) Principles*. www.epa.gov/pesticides/factsheets/ipm.htm
[26] *See* www.epa.gov/pesp.
[27] *See Label Review Manua*l, Directions for Use. www.epa.gov/oppfead1/labeling/lrm/chap-11.htm
[28] *See e.g., Read the Label First* and *Consumer Labeling Initiative*. www.epa.gov/pesticides/label/index.html.

- Required or preferred application methods, and prohibited methods;
- Proper application of the pesticide and the rate of application;
- Restrictions on use for factors such as weather, season, contamination of sensitive areas;
- Limits on how often the pesticide should or may be applied;
- Maximum applicable rates; and
- Any other requirements as necessary

IV. Radon[29]

The 1988 Indoor Radon Abatement Act (IRAA)[30] established the national goal that air within buildings in the U.S. "should be as free of radon as the ambient air outside." IRAA does not explicitly *require* EPA to promulgate regulations, but Section 310 *authorizes* EPA to issue "regulations as may be necessary" to carry out the statute. IRAA also authorizes EPA to provide grants to states to support testing and reducing radon in homes.

EPA relies on voluntary programs to promote radon awareness, testing, and reduction. The program sets an "Action Level" of 4 picocuries per liter (pCi/l) of air for indoor radon. This level "is *not* the maximum safe level for radon in the home" but, rather, is the point at which EPA has deemed the cost to the homeowner to fix the problem is warranted by the risk. EPA works with homeowners, home builders, building code organizations, and others to promote awareness, make new homes more radon resistant, and encourage radon testing when existing homes are sold.

In June 2008, EPA's Inspector General (IG) announced that radon exposure has increased since 1988, and that EPA's voluntary program has not achieved the IRAA's national goal.[31] The IG recommended that EPA:

- "Develop a strategy" for achieving IRAA's goal using the rulemaking authority of section 310 – or "explain its alternative strategy";
- "Identify limitations" in its statutory authority, and report these to Congress;
- Provide "metrics that will better measure the magnitude of the potential radon problem in relation to the number of homes at risk"; and
- Revise how EPA reports Indoor Radon Program results in its accountability reports.

[29] Source: www.epa.gov/radiation/radionuclides/radon.html#epadoing
[30] Title III of the Toxic Substances Control Act, 15 U.S.C. §§ 2661-2671.
[31] EPA Office of the Inspector General, *More Action Needed to Protect Public from Indoor Radon Risks*. www.epa.gov/oig/

G. EPA's Renovation, Repair and Painting Rule

Scope of Rule:

Renovation, repair and painting activities on **target housing** or **child-occupied facility** built before 1978 performed for compensation after April 22, 2010. Renovation is any modification of any existing structure or portion of an existing structure that results in disturbance of painted surfaces.

- **Target Housing:** Housing constructed prior to 1978, except:
  - Housing for the elderly or persons with disabilities (unless any one or more children age 6 years or under resides or is expected to reside in such housing for the elderly or persons with disabilities); or
  - Any 0-bedroom dwelling.
- **Child-Occupied Facility:** Building, or portion of a building, constructed prior to 1978, visited regularly by the same child, under 6 years of age, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visits last at least 6 hours, and the combined annual visits last at least 60 hours. It also encompasses:
  - Only those common areas that are routinely used by children under age 6, such as restrooms and cafeterias, not simply passed through.
  - Exteriors sides of the building immediately adjacent to the child-occupied facility or the common areas routinely used by children under age 6.

Activities Exempt from Compliance with the Requirements:

- **Abatement**: Activities conducted under abatement rules by certified abatement contractor.
- **Minor Repair or Maintenance Activities:** Activities that will disturb less than the following square feet of paint surfaces in 30 calendar days (counting all paint on a removed component):
  - 6 square feet per room for interior activities; or
  - 20 square feet for exterior activities.

  But this exemption does NOT apply to the following:
  - Window replacement.
  - Demolition of painted surface areas.
  - Using any of the following:
    - Open-flame burning or torching;
    - Machines to remove paint through high-speed operation without HEPA exhaust control; or
    - Operating a heat gun at temperatures at or above 1100 degrees Fahrenheit.
- **No Lead-Based Paint Will be Disturbed**: If one of the following methods is used to determine that the paint on the component to be disturbed was not lead-based paint:
  - Written determination by certified lead inspector or risk assessor; or
  - Proper use of EPA-recognized test kit by certified renovator. *Note that person contracting for the renovation must be informed of results by certified renovator within 30 days after renovation complete.*
- **Do-It-Yourself:** Work performed by owners themselves in their residence.

EPA'S RRP RULE DOES NOT PREEMPT MORE STRINGENT REQUIREMENTS SUCH AS THOSE BY HUD, STATES OR COMMUNITIES

Limits on Scope of Rule:

- **Owner-Occupied Target Housing:** Exempt from training and work practice requirements if owner signs written statement that all apply:
  - No child under age 6 resides there. Resides means:
    - Primary residence of custodial parents, legal guardians, and foster parents; or
    - Informal caretaker's residence where child lives and sleeps most of the time.
  - No pregnant woman resides there; and
  - Not child-occupied facility.
- **Emergency Renovations Not Due to Elevated Blood Level:** Exempt from information distribution, warning signs, containment, waste handling, training and certification requirements to extent necessary to respond to emergency. However, cleaning requirements, cleaning verification, and recordkeeping still required. An emergency renovation is one that:
  - Is a sudden, unexpected event
  - If not immediately attended to:
    - Presents a safety or public health hazard; or
    - Threatens equipment and/or property with significant damage.
- **Emergency Renovations in Response to Elevated Blood Lead in Resident Child:** Interim controls are exempt from advance information distribution requirements.

Deadlines in EPA's Renovation, Repair and Painting Rule

Deadlines	6/21/08	12/22/08	4/22/09	10/22/09	4/22/10
Training Firms			May apply for EPA accreditation		**Full Compliance Required**
Renovation Firms				May apply for EPA certification	
Certified Renovators (Individuals)	Stop claims of training for EPA certification as renovator or dust sampling technician without accreditation.*				
New *Renovate Right* pamphlet		New pamphlet must be used**			
EPA-Recognized Test Kits	EPA recognizes negative tests				

* People can continue offering and taking the HUD- and EPA-approved, eight-hour, lead-safe work practices course. People who take or have taken this course will only need to take the four-hour, certified renovator refresher course instead of the eight-hour, certified renovator initial training course.

** Go to www.epa.gov/lead/pubs/renovation.htm to download a copy of the new "*Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools*" pamphlet.

Advance Information Distribution Requirements

40 CFR 745.84

	Inside Dwelling Units in Target Housing	In Common Areas of Multi-Unit Target Housing	In Child-Occupied Facilities (including in target housing)
When to Notify?	No more than 60 days before beginning work (7 days if mailing).		
What to Deliver?	EPA Pamphlet[1]	Either: 1. Written notice to each affected unit;[4] or 2. Post informational signs[6] and EPA Pamphlet.[1,5].	EPA Pamphlet[1]
Documentation of Delivery to Owner	Owner's signature on acknowledgment[2] or certificate of mailing.		
Documentation of Delivery to Adult Occupant	Same as above (for owner) or certify in writing that attempt made but was unsuccessful.[3]	*See Additional Documentation Below.*	If facility is not owner, then same as above or certify in writing that attempt made but was unsuccessful. [3]
Notice to Parents or Guardians	*No additional notice required.*	*No additional notice required.*	Provide EPA pamphlet and renovation information to parents and guardians by either: 1. Mail; 2. Hand delivery; or 3. Post informational signs[6] and EPA Pamphlet.[1,5]
Notice of Changes to Scope, Locations and Dates of Work	*None Required*	If notice given to each affected unit, update notice before initiating work.	*None required*
Additional Documentation	*None Required*	Signed and dated statement of steps performed to notify all occupants and provide them with EPA pamphlet.	Signed and dated statement of steps performed to notify parents and guardians and provide them with EPA pamphlet.
Post-Renovation 30-Day Notice to Person Contracting for Renovation.	• If EPA-recognized test kits were used, provide manufacturer and model of test kit used, description and location of components tested, and test kit results. • If dust clearance sampling is performed in lieu of cleaning verification, provide copy of the dust sampling report.		

[1] EPA's new "*Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools*." The existing "*Protect Your Family from Lead in Your Home*" pamphlet can be used before 12/22/08.

[2] Must acknowledge receipt of the EPA pamphlet prior to start of renovation and contain the address of unit undergoing renovation, name and signature of owner or occupant, and the date of signature. It must be in same language as contract for renovation for owner and for lease for occupant of non-owner occupied target housing.

[3] Certification requires: address of unit; date and method of delivery; names of person making delivery; reason for acknowledgement; signature of certified renovator; and date of signature.

[4] Notice must describe: general nature and locations of the planned renovation activities; the expected starting and ending dates; statement of how occupant can get pamphlet at no charge from renovation firm.

[5] If pamphlet is not posted then provide information on how interested occupants can review a copy of the pamphlet or obtain a copy from renovation firm at no cost.

[6] Signs must describe general nature and locations of the renovation and the anticipated completion date.

Required Work Practices for Renovations

40 CFR 745.85

	Interior Renovations	Exterior Renovations
Information Distribution 40 CFR 745.84	*See Previous Table*	
Work Area Identification	Physical area that the Certified Renovator establishes to contain the dust and debris generated by renovation.	
Occupant Protection		
• Where to post signs?	At perimeter of work area	
• What to say on signs?	Warn occupants and others not involved in renovation to remain outside the work area. OSHA Lead Warning Sign is acceptable.	
• What language?	Primary language of occupants to extent practicable	
• When to post signs?	Before beginning renovation until after post-renovation cleaning verification is completed.	
Containing the Work Area		
• Isolate work area.	Take steps necessary to ensure no dust or debris leaves work area while renovation is being performed.	
• Maintain integrity of containment.	Ensure plastic and other impermeable materials are not torn or displaced.	
• Emergency exit	Ensure containment installed so that it does not interfere with occupant and worker egress in an emergency.	
Preparing the Work Area		
• Objects in Work Area	Remove or cover with impermeable material with all seams and edges sealed.	*Not Required*
• Ducts Opening in Work Area	Close and cover all ducts with impermeable material.	*Not Required*
• Windows and Doors in Work Area	Close windows and doors. Cover doors with impermeable material.	Close doors and windows within 20', and, on multi-story buildings, all below renovation.
• Access Doors	If door is used while job is being performed, allow workers to pass through while confining dust and debris to work area.	
• Floors / Ground	Cover with taped-down impermeable material 6' beyond the perimeter of surfaces undergoing renovation or a sufficient distance to contain the dust, whichever is greater.	Cover with disposable impermeable material extending 10' beyond perimeter of surfaces undergoing renovation or a sufficient distance to collect falling paint debris, whichever is greater, unless the property line prevents 10' of such ground covering.
• Tools	Ensure all personnel, tools, waste containers and other items are free of dust and debris before leaving the work area.	*Not Required*
Prohibited and Restricted Work Practices	The following must not be used in the work area. • Open-flame burning or torching; • Machines to remove paint through high-speed operation without HEPA exhaust control; or • Operating a heat gun at temperatures at or above 1100 degrees Fahrenheit.	
Waste from Renovations		

Required Work Practices for Renovations

40 CFR 745.85

	Interior Renovations	Exterior Renovations
• During Work	Contain waste to prevent release of dust and debris before the waste is removed from the work area for storage or disposal. If a chute is used to remove waste from work area, it must be covered	
• End of Day and End of Work	Collected waste must be stored under containment, in an enclosure, or behind a barrier that prevents release of dust and debris out of work area and prevents access to dust and debris.	
• Transporting Waste	Contain waste to prevent release of dust and debris.	
Cleaning the Work Area		
• Paint Chips & Debris	Collect and, without dispersing any of it, seal this material in a heavy-duty bag.	
• Plastic Sheeting	Leave sheeting to isolate contaminated rooms in place under after cleaning and removal of other sheeting. Mist protective sheeting before folding it. Fold the dirty side inward. Tape shut to seal or seal in heavy-duty bags.	
• General	Clean all objects and surfaces in work area and 2' outside work area cleaning from higher to lower	
• Walls	Use HEPA vacuum[1] or wiping with a damp cloth	
• Carpets and Rugs	Thoroughly vacuum with a HEPA vacuum[1] equipped with a beater bar.	
• Remaining Surfaces	Thoroughly vacuum remaining surfaces and objects with a HEPA vacuum.[1]	
• Final Cleaning – Other Than Floors	Wipe remaining surfaces and objects, except for carpeted or upholstered surfaces, with a damp cloth.	
• Final Cleaning – Uncarpeted Floors	Mop floors thoroughly using a mopping method that keeps wash water separate from the rinse water or using a wet mopping system.[2]	
Post Cleaning Verification	*See Next Table*	

[1] "HEPA vacuum" means a vacuum cleaner which has been designed with a high-efficiency particulate (HEPA) filter as the last filtration stage. A HEPA filter is a filter that is capable of capturing particles of 0.3 microns with 99.97% efficiency. The vacuum cleaner must be designed so that all the air drawn into the machine is expelled through the HEPA filter with none of the air leaking past it.

[2] "Wet mopping system" means a device with the following: A long-handle; a mop head designed to be used with disposable absorbent cleaning pads; a reservoir for cleaning solution; and a built-in mechanism for distributing or spraying the cleaning solution onto a floor, or a method of equivalent efficacy.

Post-Renovation Cleaning Verification

40 CFR 745.85(b)

Activities	Windowsills	Uncarpeted Floors and Countertops in Work Area
Dust clearance testing is an option if contract or other rules require it.	*Permissible alternative to the steps below. Work area must meet EPA clearance standards.*	
Certified Renovator must personally perform all cleaning verification except recleaning.[1]	Required	
Step 1: Visually inspect work area for dust, debris, and residue.	Required	
Step 2: If failed visual, have it recleaned.[1]	Required	
Step 3: Wipe with wet disposable cleaning cloth.[2]	Required. Cloth must be damp to touch.	Required. Cloth must be damp when used. One cloth per 40 square feet.
Step 4: Compare to cleaning verification card.[3] If lighter than card, then work passes.	Required.	
Step 5: If failed, have it recleaned.[1]	Required if failed 1st wipe.	
Step 6: Wipe surface again with new wet disposable cleaning cloth.[2]	Required if failed 1st wipe. Can use clean surface of used wipe.	Required if failed 1st wipe.
Step 7: Compare to card. If lighter than card, then work passes.	Required if failed 1st wipe.	
Step 8: If failed, wait one hour or until dried completely whichever is longer.	Required if failed 2nd wipe.	
Step 9: Wipe with dry, disposable cleaning cloth.[4] The work passes.	Required if failed 2nd wipe. Passes even if darker than card.	
Notice to owner or occupant.	*None required.*	

[1] "Recleaning" means:

1) Thoroughly vacuum surfaces and objects in the work area with a HEPA vacuum. HEPA vacuum must have a beater bar when vacuuming carpets and rugs.
2) Wipe all remaining surfaces and objects in the work area, except for carpeted or upholstered surfaces, with a damp cloth.
3) Mop uncarpeted floors thoroughly using a mopping method that keeps wash water separate from the rinse water or using a wet mopping system (using disposable absorbent cleaning pads).

[2] "Wet disposable cleaning cloth" means a commercially-available, premoistened, white disposable cloth designed to be used for cleaning hard surfaces.

[3] "Cleaning verification card" means a card developed and distributed, or otherwise approved, by EPA for the purposes of determining whether post-renovation cleaning has been properly completed.

[4] "Dry disposable cleaning cloth" means a commercially-available, dry, electrostatically-charged, white disposable cloth designed to be used for cleaning hard surfaces.

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

SPECIAL ATTENTION OF:
Regional Directors; State and Area Coordinators; Public Housing Hub Directors; Program Center Coordinators; Troubled Agency Recovery Center Directors; Special Applications Center Director; Administrators, Offices of Native American Programs; Public Housing Agencies; Housing Choice Voucher/Section 8 Public Housing Agencies; Tribally Designated Housing Entities; Indian Tribes; Resident Management Corporations.

NOTICE PIH 2007-12 (HA)

Issued: May 24, 2007

Expires: May 31, 2008

Cross Reference:
24 CFR 903.7(e)(2)
This Notice Supersedes Notice PIH-2006-11 (HA

Subject: Guidance on Integrated Pest Management

1. PURPOSE: The purpose of this Notice is to inform public housing agencies (PHAs) and Tribally Designated Housing Entities (TDHEs) to reference materials on Integrated Pest Management (IPM) located in Maintenance Guidebook Seven: Termite, Insect and Rodent Control and reference material located at paragraph 7 of this notice. PHAs and TDHEs (HAs) may choose to share this information with families and property owners participating in their programs.

2. APPLICABILITY: The information in this Notice may be of interest to HAs, property owners, property managers, and family program participants when they review their pest control efforts. The decision to reflect IPM processes in their ongoing pest control efforts rests solely on local management. The use of this material is voluntary for the HAs; however, HUD promotes the use of IPM for pest control.

3. BACKGROUND: The goal of IPM (per the Environmental Protection Agency) is to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. To undertake IPM, property managers should be committed to ongoing or continuous monitoring and record keeping, education of residents and staff, and good communication between residents and building managers. IPM methods involve restricted access to food/water, sanitation and waste management, mechanical control, natural control agents, physical barriers, structural maintenance, and, where necessary, conservative application of pesticides.

   HUD has supported IPM for more than two decades and published and distributed Maintenance Guidebook Seven: Termite, Insect, and Rodent Control, to all PHAs in 1995. Some HAs use the IPM approach to pest management and have seen it dramatically reduce both pest populations and pesticide use. IPM programs have also positively engaged residents through the outreach and education needed to prepare them for their role in implementing IPM.

4. DEFINITION: IPM efforts involve HA staff, contractors, and residents, and include:

    a. Communicating the HA's IPM policies and procedures to all building occupants, administrative staff, maintenance personnel, and contractors.
    b. Identifying (1) pests and (2) environmental conditions that limit the spread of pests, including the presence of pests' natural enemies.
    c. Establishing an ongoing monitoring and record keeping system for regular sampling and assessment of pests, surveillance techniques, and remedial actions taken, including establishing the assessment criteria for program effectiveness.
    d. Determining, with involvement of residents, the pest population levels – by species – that will be tolerated, and setting action thresholds at which pest populations warrant action.
    e. Improving sanitation, waste management, mechanical pest management methods, and/or natural control agents that have been carefully selected as appropriate in light of allergies or cultural preferences of staff or residents.
    f. Monitoring and maintaining structures and grounds (e.g., sealing cracks, eliminating moisture intrusion/accumulation) and adding physical barriers to pest entry and movement.
    g. Developing an outreach/educational program and ensuring that leases reflect residents' responsibilities for: (1) proper housekeeping, (2) reporting presence of pests, leaks, and mold, and (3) cooperating with specific IPM requirements such as obtaining permission of HA management before purchasing or applying any pesticides.
    h. Enforcing lease provisions regarding resident responsibilities such as housekeeping, sanitation, and trash removal and storage.
    i. Using pesticides only when necessary, with preference for products that, while producing the desired level of effectiveness, pose the least harm to human health and the environment, and, as appropriate, notifying PHA management before application.
    j. Providing and posting 'Pesticide Use Notification' signs or other warnings.

5. HEALTH AND COST CONCERNS: Pests may adversely impact health and contribute to worsening some diseases, such as allergies and asthma. Therefore, pest control methods are targeted to protecting the health of residents and staff. Even though applying pesticides may be effective in eliminating pest populations, many of these chemicals may be associated with health and/or environmental risks, and their use should be minimized if alternative methods exist. IPM frequently has proven to be more effective in reducing pest populations than depending solely on broadcasting pesticides. Therefore, IPM offers the potential of ensuring efficacy of pest elimination while protecting the health of residents and staff.

    Most of the effective methods of pest elimination, including ongoing repairs, erection of barriers, and monitoring, will extend the useful life of the property and, thereby, generate significant savings that offset costs of the pest control operations. Many of these non-application methods, including structural maintenance, especially inspecting for and repairing leaking pipes and cracks in roofs, walls, and windows are effective in preventing moisture intrusion and accumulation. Additionally, IPM-conscious HAs assess the need to install physical barriers to both pest entry and pest movement within every structure.

6. IMPLEMENTATION: The choice of pest control strategies is the decision of HAs' property owners and managers. HAs may choose to implement IPM. This may be done to the extent, and in the manner, they determine best, at their discretion. If a HA uses an outside contractor for pest control, the HA's pest control/IPM policies and procedures should be incorporated into the specifications or statement of work for the pest management contract. The HA may also consider training for maintenance staff and education for residents as well as for HA administrative staff who oversee housing developments or administer occupancy and rental duties such as unit housekeeping inspections. If the HA uses its own maintenance staff for pest management, proper training in the HA's IPM procedures is essential. The contract administrator for any pest management contract should also be trained. Successful results rely upon proper implementation; training is therefore of the utmost importance. Not only must maintenance staff be trained, but also residents and their elected leaders. Successful IPM requires resident participation through proper housekeeping, reporting of pest infestations, and trash removal. Residents can monitor pest populations and assist in identifying how to eliminate access to food and water for pests. HUD encourages HAs to partner with local pest management organizations.

7. REFERENCE MATERIALS FOR IMPLEMENTING IPM:

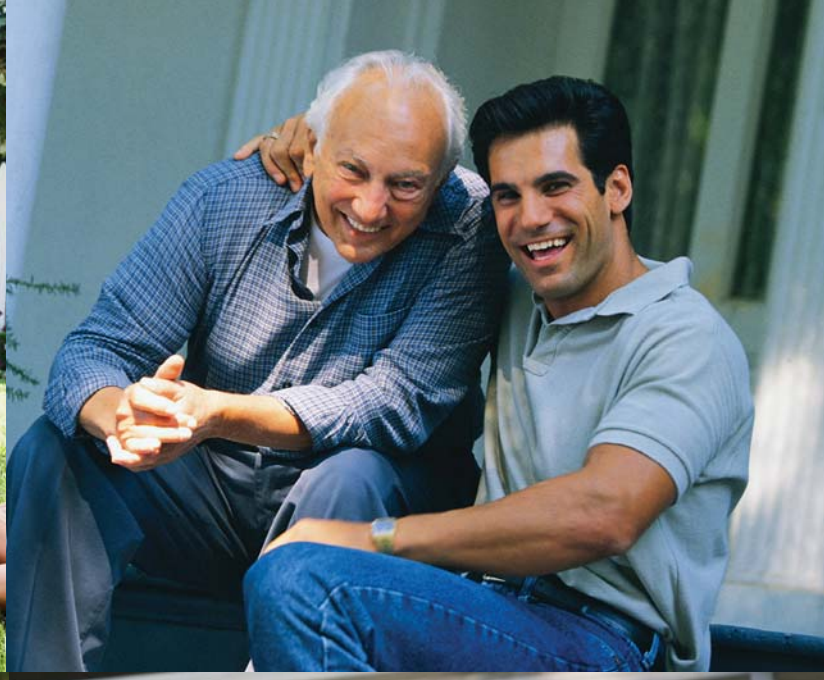
   a. PIH Maintenance Guidebook Seven – Termite, Insect & Rodent Control (September, 1995): http://hudclips.org/sub_nonhud/cgi/pdfforms/HUDGB7.pdf
   b. PIH Notice 95-66: http://www.hudclips.org/sub_nonhud/cgi/pdfforms/HUDGB1N.pdf
   c. General Services Administration
      i. GSA Guidelines For Structural Pest Control Operations: http://schoolipm.ifas.ufl.edu/doc/bus_prac.html
      ii. Integrated Pest Management Program - Contract Guide Specification (1999) http://schoolipm.ifas.ufl.edu/doc/contract.pdf
   d. U.S. Environmental Protection Agency
      i. General IPM information (for schools, but generally applicable to such other large buildings as multifamily housing): http://www.epa.gov/pesticides/ipm
      ii. EPA staff contacts: http://www.epa.gov/pesticides/about/contacts.htm#ipm
      iii. List of EPA IPM publications and instructions for ordering documents http://www.epa.gov/oppfead1/Publications/catalog/subpage3.htm
   e. U.S. Department of Defense - Armed Forces Pest Management Board Technical Guide No. 29 Integrated Pest Management (IPM) In And Around Buildings http://www.afpmb.org/pubs/tims/tg29/tg29.htm
   f. Massachusetts Department Of Food And Agriculture Pesticide Bureau - Integrated Pest Management Kit For Building Managers: http://www.pestinfo.ca/documents/IPMkitforbuildingmanagers.pdf
   g. Alliance for Healthy Homes http://www.afhh.org/dah/dah_pesticides.htm
   h. Canada
      i. University of Toronto, Integrated Pest Management in Housing, http://www.utoronto.ca/forest/termite/IPMH.html
   i. IPM Institute of North America - IPM Standards for Schools:
      i. http://www.ipminstitute.org/school.htm
      ii. http://www.ipminstitute.org/IPM_Star/ipmstar_profiles_monroe_county_in.htm
   j. PHA RESOURCE
      ii. HUD-funded "Healthy Public Housing Project" conducted by Harvard School of Public Health in Boston public housing http://www.hsph.harvard.edu/hphi

k. PHA Case Studies
   iii. CUYAHOGA HOUSING AUTHORITY**:** http://www.ehw.org/Asthma/ASTH_EPA_IPM_CaseStudy.pdf
   iv. Boston Housing Authority: http://www.asthmaregionalcouncil.org.about/documents/IPMinMultifamilyHousing7.25.06.doc

The above list of IPM practices does not constitute a HUD endorsement of any specific practice, but provides IPM ideas and practices that have reportedly been used to improve pest management while reducing unnecessary dependence on pesticides. HUD encourages PHAs/TDHEs to share their policies, procedures, resident leases, and written case studies so that these may be published on the HUD web for others to read.

For further information about this Notice, contact the nearest HUD Office of Public Housing within your state. Tribes and TDHE's should contact the nearest HUD Office of Native American Programs. Locations of these offices are available on HUD's website at http://www.hud.gov

/s/
Orlando J. Cabrera, Assistant Secretary for
Public and Indian Housing

U.S. Department of Health and Human Services
U.S. Department of Housing and Urban Development

Healthy Housing Inspection Manual

Contents

Preface

THE ***HEALTHY HOUSING INSPECTION MANUAL*** completes the foundation of the Centers for Disease Control and Prevention's (CDC's) Healthy Homes Initiative. The manual reflects the ongoing commitment of both CDC and the U.S. Department of Housing and Urban Development (HUD) to work together to provide local jurisdictions with tools to address housing-related health hazards. Development of this manual was supported by the HUD and CDC Healthy Homes Initiatives.

The agencies' initiatives related to healthy homes were created to develop a holistic approach to healthy housing based on the following broad objectives:

- Broaden the scope of single-issue public health and safety programs—such as childhood lead poisoning prevention, residential asthma intervention, injury prevention—to adopt a holistic approach addressing multiple housing deficiencies that affect health and safety.
- Build competency among environmental public health practitioners, public health nurses, housing specialists, housing owners, housing managers, and others who work in the community so they can incorporate healthy housing activities into their professional activities.
- Develop national healthy homes capacity through crossdisciplinary grants, contracts, and other activities at the federal, state, tribal, and community levels that research and demonstrate low-cost, effective home hazard assessment and intervention methods.
- Develop effective education and outreach materials, with a particular focus on high-risk populations, to increase public awareness of residential hazards and highlight effective actions households can take to reduce the risk for illness and injury.

The *Healthy Housing Inspection Manual* is a model reference tool that local jurisdictions or others may use as is or modify based on local needs. Use of the manual is expected to improve the effectiveness and efficiency of the public health, housing management, and workforces that identify, prevent, and control health problems associated with housing. The manual does not introduce any inspection requirements, nor does it modify any existing inspection requirements for housing agencies, residents, HUD, or CDC. The manual is not a substitute for the Federal Housing Administration (FHA) Minimum Property Standards. Finally, the manual does not propose to establish any regulatory authority for HUD or CDC with regard to residential inspection requirements.

The *Healthy Housing Inspection Manual* takes environmental health professionals and housing managers, specialists, and inspectors through the elements of a holistic home inspection. It is also a useful reference tool for nurses, outreach workers, and others who are interested in preventing illness and injury due to residential health and safety hazards.

The *Healthy Housing Inspection Manual* addresses the broad range of housing deficiencies and hazards that can affect residents' health and safety. The purpose of the manual is to

- improve communication and collaboration among public health professionals, housing professionals, property owners and property managers,
- increase the understanding of the relations among exposure to hazardous agents, conditions in the home, and adverse health outcomes, and
- improve the ability of programs to address an array of housing deficiencies in an efficient, effective, and timely manner.

HUD and CDC have also jointly developed and funded other important activities related to healthy homes, including

- a healthy housing curriculum that addresses the training needs of environmental public health practitioners, public health nurses, housing specialists, and others interested in building local capacity to address housing-related health hazards (Healthy Homes Training Center and Network, http://www.healthyhomestraining.org).

- the *Healthy Housing Reference Manual*, which gives public health and housing professionals the tools necessary to ensure that housing stock is safe, decent, and healthy for our citizens, particularly children and the elderly, who are often most vulnerable and spend more time in the home (http://www.cdc.gov/nceh/publications/books/housing/housing.htm).

FORMAT OF THIS MANUAL

HUD and CDC recommend that section 1, the Healthy Housing Model Resident Questionnaire (a voluntary health assessment), be completed first. The questionnaire should be used to collect information that cannot be determined visually. Information from the questionnaire can provide important clues that point to housing deficiencies.

SECTION 2, the Visual Assessment Data Collection Form, should be used to collect information that can be determined without asking questions of a resident. This form includes detailed assessment of exterior housing, kitchen, bathroom, and living area, as well as a general building information.

This manual also contains three supporting appendices:

- a data dictionary that defines housing deficiencies listed in the Visual Assessment Data Collection Form;
- a cross-reference to code provisions in the 2003 International Property Maintenance Code (2003 IPMC); and
- additional resources (links to environmental sampling methods and to more information about substances or issues related to healthy housing).

Visual Survey Report

Resident: _____

Alternate Contact: _____

Address: _____

Unit # **Unique ID** _____

Resident Phone: _____

Visual Conducted by:

_____

Date:

_____

Make a checkmark (✓) if the problem appears in the room or area. For deteriorated paint and water damage, indicate the extent of the problem (see instructions) Use the extra rows to identify any other hazards you notice. Put an asterisk (*) above any room(s) where a child sleeps or plays. Circle (◯) where you photograph a problem.

ROOM OR AREA

PROBLEM		Exterior	Porch	Entryway	Living Room	Dining Room	Kitchen	Bedroom 1	Bedroom 2	Bedroom 3	Bathroom 1	Bathroom 2	Basement		
Deteriorated paint	Walls														
	Windows, door, or trim														
	Paint chips on floor														
Soil with no grass or mulch															
Cockroaches															
Rodents															
Holes in wall															
Mold/ Mildew	Obvious source of moisture														
	No obvious source of moisture														
Water Damage: walls wet/newly stained															
Strong musty smell															
Natural gas/sewer gas smell															
Unvented gas oven/dryer/heater															
Worn-out carpeting															
Other:															
Other:															
Other:															
Other:															
Other:															

If renting, received lead hazard disclosure information from landlord? **Yes** **No**

Follow-up visit scheduled for: **Date** _____ **Time:** _____

Visual Survey Instructions

1. Talk with the resident before you begin:

- ❒ Explain that you will draw floor and site plans, take notes, take photographs, collect samples, and possibly leave roach traps, a carbon monoxide alarm, or radon detectors for more than one day.
- ❒ Explain what kinds of samples you plan to take after you finish the visual survey.
- ❒ If a tenant, ask whether the resident received lead hazard disclosure information from the landlord and note the response in the space provided at the bottom of the **Visual Survey Report**.

2. Survey the exterior and grounds and draw the Site Plan:

The Site Plan is a sketch of the area around the home where you will not any problems you identify and where you collect soil samples. See CEHRC's website for the Site Plan form and an example.

- ❒ Walk around outside the building to look at the overall layout of the property.
- ❒ On the **Site Plan**, draw the outline of the building and where it sits on the property.
- ❒ Label important features on the **Site Plan**:
  - The location of the street and other landmarks
  - Play areas
  - Trash areas (dumpster, trash collection area)
  - Outdoor parking areas
  - Garages or other buildings

3. Note hazards on Site Plan and Visual Survey Report:

❒ Note the following hazards, **(1)** on the Site Plan, AND **(2)** by making a check mark next to the name of the problem in the "exterior" column on the **Visual Survey Report**:

- **Bare soil (no grass, mulch, or wood shavings) in the yard around the home or in a common outdoor area:** in play areas (in sand boxes, under swing sets, in areas where kids play), along the "dripline" within three feet of the building, and in other areas of the yard.

- **Deteriorated Paint (peeling, flaking, chipping, cracking):**
  - Deteriorated in any way
  - Paint coming loose from the surface or substrate (wood, plaster, metal, drywall)
  - On the home, fences, etc.

- **Holes in the walls of the building.** Look for openings around windows and doors.

❒ Indicate the extent of the problem for **deteriorated paint and water damage** by noting on the following on the Visual Survey Report:

- N = None
- L = Low (less than $2ft^2$)
- M = Moderate (2 - $10ft^2$)
- H = High ($10ft^2$ or more)
- E = Extreme (structural damage caused by this problem)

❒ Note the following hazards on the **Visual Survey Report** only:

- **Rodents or evidence:** Note if you see, or the resident reports seeing, rats or mice, or very small pellets that may be rodent droppings.

- **Other physical conditions that seem hazardous,** such as standing water, woodpiles near exterior walls, accumulated trash, obvious water damage or wood rot, and damaged gutters, downspouts and other

building components.

4. Draw one Floor Plan for each floor of the home:

The Floor Plan shows the layout of the rooms (as seen from above). The Floor Plan makes it easy for you to note where you identify problems. You will also use the Floor Plan to show where you collect samples, leave testing materials for collection, and take photographs.

The Floor Plan does not have to be drawn using exact measurements. It should show the general relationships between rooms in the home and exterior walls. See CEHRC's website for the Floor Plan for and an example.

- ❒ Walk through the home to get a good understanding of the overall layout of the rooms.
- ❒ Draw the overall outline of the entire home.
- ❒ If the home has more than one floor, note which floor each **Floor Plan** represents before you draw it. If the home has two floors, one copy of the floor plan will be marked "**1 of 2**" and the other will be "**2 of 2**". If you draw a plan for an unoccupied basement, mark it "**0**".
- ❒ Draw the walls between rooms, then the doors and windows:

  a. Draw a rectangle for each door. 

  b. Draw a circle through the line of the wall for each window. 

  c. Mark the walls of closets to help you keep the walls in perspective and avoid confusion about the doors.
- ❒ Label each room using the same names and abbreviations as listed on the **Visual Survey Report**
- ❒ Draw an asterisk (*) in rooms where children sleep or play.
- ❒ Be sure to note entryway of the home.

5. Perform the Visual Survey: note hazards on both the Floor Plan and Visual Survey Report

- ❒ Fill in the top of the **Visual Survey Report** and cross out columns for rooms that are not present. Add names or areas if necessary. If you

do not have enough columns, use a second copy of the report and write "**1 of 2**" on the first sheet and "**2 of 2**" on the second.

❒ Draw a star/asterisk (*) next to the names of rooms where children sleep or play.

❒ In each room, look for the problems listed below. For each, (**1**) note the location of each problem on the floor plan using the abbreviation from the key below, AND (**2**) make a check mark (☑) next to the name of the problem in the column for that room on the **Visual Survey Report**.

a. Deteriorated paint (peeling, flaking, chipping, cracking paint):

- Deteriorated in any way
- Paint coming loose from the painted surface (wood, plaster, metal, drywall)
- Teeth marks on the painted surface.

b. Cockroaches or their remains: Note the location if you see any cockroaches, their shells or debris, or if the resident reports seeing them.

c. Holes in walls between the inside and outside of the building and between rooms. Look for openings around windows and exterior doors.

d. Unvented gas oven, clothes dryer, or heater: An appliance that burns natural gas, kerosene, wood, or other fuel is "unvented" if it does not have a pipe or ductwork that sends the exhaust outside.

e. Mold or fungus or similar stains on the wall, on the carpet, under sinks, outside of showers, or around windows. On the Visual Survey Report, check "obvious source of moisture" if the mold is near a source such as a dripping drain or moisture around a window. If there is no obvious moisture source for the mold, check the other box.

❒ Indicate the <u>extent</u> of the problem for **deteriorated paint and water damage** by noting on the following on the Visual Survey Report:

- N = None
- L = Low (less than 2ft^2)
- M = Moderate (2 - 10ft^2)
- H = High (10ft^2 or more)
- E = Extreme (structural damage caused by this problem)

❒ On the **Visual Survey Report** only, note the following potential problems:

a. Walls appear wet or newly stained, or the plaster or drywall is bulging.

b. Rodents or evidence: Note if you see, or the resident reports seeing, rats or mice, or very small pellets that may be rodent droppings.

c. Strong musty smell like mold or fungus.

d. Natural gas or sewer gas smell. If you think you smell natural gas, advise the resident to call the gas company immediately.

e. Old or worn-out carpeting if in poor condition or extremely dirty.

f. Other: write in additional physical conditions that seem problematic (such as other odors, water leaks, etc.)

6. Double-check the Visual Survey Report, Floor Plan, and Site Plan:

❒ The resident's name, address, and unit number, and your name should be filled in.

❒ Make sure the names of the rooms on the **Floor Plan(s)** match those on the **Visual Survey Report**.

7. Determine further testing needs and locations:

Plan to take samples if you have identified any of the following:

❒ Deteriorated paint (lead)

❒ Bare soil (lead)

❒ Water damage (lead, mold and moisture)

❒ Unvented appliances (carbon monoxide)

❒ Cockroaches or evidence

8. Provide follow-up instructions, schedule the next visit, and thank the resident:

❒ Explain approximately when and how the **Summary Results Report** will be presented.

Schedule a time when someone will be home if you need to return to collect tests for carbon monoxide, cockroaches or radon, and note this on the Visual Survey Report.

Pediatric Environmental Home Assessment

Last updated 6/7/06

RESIDENT REPORTED INFORMATION

Bolded *responses indicate areas of greater concern.*

General Housing Characteristics					
Type of ownership		❑ Own house	❑ Market rate rental hsg.	❑ Subsidized rental hsg.	❑ Shelter
Age of home		**❑ Pre-1950**	**❑ 1950 - 1978**	❑ Post-1978	**❑ Don't know**
Structural foundation		❑ Basement	❑ Slab on grade	❑ Crawlspace	❑ Don't know
Floors lived in (check all that apply)		❑ Basement	❑ 1st	❑ 2nd	❑ 3rd or higher
Heating	**Fuel used**	❑ Natural gas	❑ Oil	❑ Electric	❑ Wood
	Sources in home	❑ Baseboards	❑ Radiators	❑ Forced hot air vents	**❑ Other: _____**
	Filters changed	❑ Yes	**❑ No**	❑ HEPA air filter	**❑ Don't know**
	Control	❑ Easy to control heat	❑ Hard to control heat		
Cooling		❑ Windows	❑ Central/window AC	❑ Fans	❑ None
Ventilation (check all that apply)		❑ Open windows	❑ Kitchen & bathroom fans	❑ Central ventilation	

Indoor Pollutants					
Mold and moisture		❑ Uses dehumidifier ❑ No damage	**❑ Uses vaporizer or humidifier**	**❑ Musty odor evident**	**❑ Visible water / mold damage**
Pet	**Presence**	❑ No pets	**❑ Cat #_____**	**❑ Dog #_____**	❑ Other: _____
	Management	❑ Kept strictly outdoors	❑ Not allowed in patient's bedroom	**❑ Full access in home**	❑ Sleeping location: _____
Pests	**Cockroaches**	❑ None	**❑ Family reports**	**❑ Family shows evidence**	Present in ❑ kitchen ❑ bedroom ❑ other
	Mice	❑ None	**❑ Family reports**	**❑ Family shows evidence**	Present in ❑ kitchen ❑ bedroom ❑ other
	Rats	❑ None	**❑ Family reports**	**❑ Family shows evidence**	Present in ❑ kitchen ❑ bedroom ❑ other
	Bedbugs	❑ None	**❑ Family reports**	**❑ Family shows evidence**	Present in ❑ bedroom ❑ other
Lead paint hazards		❑ Tested and passed	❑ Tested, failed, and mitigated	**❑ Not tested/Don't know**	**❑ Loose, peeling, or chipping, paint**
Asbestos		❑ Tested – None present	❑ Tested, failed, and mitigated	**❑ Not tested/Don't know**	**❑ Damaged material**
Radon		❑ Tested and passed	❑ Tested, failed, and mitigated	**❑ Not tested/Don't know**	**❑ Failed test but not mitigated**
Health and Safety Alarms		❑ Smoke alarm working and well placed	❑ CO alarm working and one on each floor	**❑ CO alarm does not log peak level**	**❑ No smoke alarm** **❑ No CO alarm**
Tobacco smoke exposure		❑ No smoking allowed	❑ Smoking only allowed outdoors	**❑ Smoking allowed indoors** **❑ bedroom** **❑ playroom**	**❑ Total # smokers in household: _____** **❑ Mother smokes**
Other irritants		❑ None	**❑ Air fresheners**	**❑ Potpourri, incense, candles**	**❑ Other strong odors: _____**
Type of cleaning		❑ Vacuum (non-HEPA)	❑ HEPA vacuum	❑ Damp mop and damp dusting	**❑ Sweep or dry mop**

NOTES:

NURSE OBSERVED INFORMATION
***Bolded** responses indicate areas of greater concern.*

Home Environment					
Drinking Water Source		❑ Public water system	❑ **Household Well**		
Kitchen	**Cleanliness**	❑ No soiling	❑ Trash or garbage sealed	❑ **Trash or garbage not sealed**	❑ **Wall/ceiling/floor damage**
	Ventilation	❑ Functioning stove exhaust fan/vent	❑ **Mold growth present**	❑ **Broken stove exhaust fan/vent**	❑ **No stove exhaust fan/vent**
Bathroom		❑ Functioning exhaust fan/vent/window	❑ **Mold growth present**	❑ **Needs cleaning and maintenance**	❑ **Wall/ceiling/floor damage**
Basement		❑ None/No Access	❑ **Mold growth present**	❑ **Needs cleaning and maintenance**	❑ **Wall/ceiling/floor damage**
Living Room		❑ No soiling	❑ **Mold growth present**	❑ **Needs cleaning and maintenance**	❑ **Wall/ceiling/floor damage**
Laundry area		❑ None	❑ Well maintained	❑ **Dryer not vented**	❑ Hang clothes to dry

Sleep Environment				
Patient's sleep area	❑ Own room	❑ Shared # in room_____	❑ Other	
# Beds	❑ 0	❑ 1	❑ 2	❑ More than 2
Allergen impermeable encasings on beds	❑ On mattress and boxspring (zippered)	❑ On mattress only (zippered)	❑ On mattress (not zippered)	❑ **No mattress covers**
Pillows	❑ Allergen-proof	❑ Washable	❑ Feather/ down	
Bedding	❑ Washable	❑ Wool/not washable	❑ Feather/ down	
Flooring	❑ Hardwood/Tile/Linoleum	❑ Small area rug	❑ Large area rug	❑ **Wall-to-wall carpet**
Dust/mold catchers	❑ Stuffed animals/washable toys ❑ No clutter	❑ **Non-washable toys**	❑ **Plants**	❑ **Other _____**
Window	❑ Washable shades/ curtains	❑ Washable blinds	❑ Curtains/ drapes	❑ **No window/ poor ventilation**
Other irritants	❑ **Abundant cosmetics and fragrances**			

Home Safety **** can indicate housing code violations***				
General				
Active renovation or remodeling	❑ **Yes**	❑ No		
***Stairs, protective walls, railings, porches**	❑ Yes	❑ **No**		
***Hallway lighting**	❑ Adequate	❑ **Inadequate**		
Poison control number	❑ Posted by phone	❑ **Not posted by phone**		
****Family fire escape plan**	❑ Developed and have copy available	❑ **None**		
Electrical appliances (radio, hair dryer, space heater)	❑ Not used near water	❑ **Used near water**		
Matches and lighters stored	❑ Out of child's reach	❑ **Within child's reach**		
Exterior environment	❑ Well maintained	❑ **Abundant trash and debris**	❑ **Chipping, peeling paint**	❑ **Broken window(s)**

NURSE OBSERVED INFORMATION (continued)

Home Safety **** can indicate housing code violations***			
Young Children Present	❑ Yes	❑ No	
Coffee, hot liquids, and foods	❑ Out of child's reach	❑ **Within child's reach**	
Cleaning supplies stored	❑ Out of child's reach	❑ **Within child's reach**	
Medicine and vitamins stored	❑ Out of child's reach	❑ **Within child's reach**	
Child (less than six years old) been tested for lead poisoning	❑ Within past 6 months Result: _____	❑ **Within past year or more.** **When? _____ Result: _____**	❑ **No**
Child watched by an adult while in the tub	❑ Always	❑ **Most of the time**	❑ **No**
***Home's hot water temperature**	❑ <120 F	❑ **>120 F**	❑ **Don't know**
Non-accordion toddler gates used	❑ At top of stairs	❑ **At bottom of stairs**	❑ **No**
Crib mattress	❑ Fits well	❑ **Loose**	❑ NA
Window guards	❑ Yes	❑ **No**	
Window blind cords	❑ Split cord	❑ **Looped cord**	

NOTES:

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National Center for Healthy Housing

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and

The Center for Healthy Homes and Neighborhoods at Boston University
We credit its model Pediatric Asthma-Allergy Home Assessment form

Pediatric Environmental Home Assessment Form

ACTION PLAN

After completing the assessment, use this as a guide for patient education and recommending corrective action.

General Housing Characteristics		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Age of home	☐ If built before 1978, educate as follows: ○ Home is likely to have lead paint. ○ Lead hazards can be harmful to young children's health and development. ○ If family has a child less than six years old then it is important to test for lead hazards. ☐ Get more information about lead testing at www.epa.gov/lead/ and provide to family. ☐ Review items in "Family To Do" column with family.	☐ If your child is less than six years old, contact the childhood lead poisoning prevention program (CLPPP) at your state and local departments of health. ☐ Consider getting a lead paint inspection or risk assessment to determine whether there are lead hazards in your home. ☐ If there are hazards, repair them based on state and local regulations and requirements. Consult with state CLPPP.
Heating source - Other: Kerosene heaters, space heaters, fireplaces, wood stoves	☐ Counsel family about the dangers of such heating sources in terms of fire safety and indoor air quality. ☐ Get more information about indoor air quality and combustion sources in the home at http://www.epa.gov/iaq/combust.html and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Make sure kerosene heaters are vented to the outdoors or not used. ☐ Make sure space heaters are at least 3 feet from anything flammable. ☐ When necessary, use only 12 or 14 gauge extension cords (the lower the better). ☐ Ensure that there is a good seal on fireplace screen or woodstove doors.
Filters	☐ Counsel family to do proper filter maintenance. ☐ Review items in "Family To Do" column with family.	☐ Change filters twice a year. ☐ Use filters which are rated MERV 9.
Indoor Pollutants		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Vaporizers/Humidifiers	☐ Counsel the family about the importance of proper vaporizer/humidifier maintenance and impact of mold growth on patient health. ☐ Get more information about humidifier maintenance at http://www.epa.gov/iaq/pubs/humidif.html and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Change the water daily with clean cold water. ☐ Use distilled or demineralized water. ☐ Clean humidifier every 3 days. Follow manufacturer's instructions. ☐ Change filter regularly. Follow manufacturer's instructions. Change more often if dirty. ☐ Keep surrounding area dry. ☐ Drain and clean humidifier before storing. ☐ Only run humidifier a few hours a day to avoid mold growth.
Mold/Musty odor	☐ Educate family about the importance of keeping things dry and the impact of mold on family health. ☐ Get more information at http://www.epa.gov/mold/moldguide.html and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Any mold or musty odor must be investigated for a source of water. Examine plumbing, roofing, or other possible leaks. ☐ If homeowner, then make necessary repairs. ☐ If renter, then talk with your landlord about needed repairs. Consider calling the local board of health for possible code violations.

Indoor Pollutants (continued)		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Pets	☐ If patient is allergic to pets, educate as follows: ○ Pets should not be allowed in bedrooms. ○ If possible, pets should be given away. ○ If pets cannot be given away, wash pet weekly to reduce allergens. ☐ Review items in "Family To Do" column with family.	☐ If symptomatic, get allergen testing to determine if you are allergic to pets.
Infestations (mice, rats, cockroaches)	☐ Educate family about pest management and behavior change. ☐ Get more information and order print materials at www.epa.gov/pesticides/catalogue and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Eliminate water and food sources. Seal garbage and all foodstuffs. Look for water leaks. ☐ Call local board of health for inspection ☐ AVOID "bombs" of pesticides. ☐ Hire, or talk to your landlord about hiring, an exterminator for "Integrated Pest Management" which does NOT include spraying pesticides.
Lead paint hazards	☐ See "Age of Home" above. ☐ Review items in "Family To Do" column with family.	☐ See "Age of Home" above.
Radon	☐ Educate family about impact of radon on health. ☐ Get more information about radon and radon testing at www.epa.gov/radon/ and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Consider purchasing a radon home test kit. ☐ Consult with your state and local departments of health about radon.
Asbestos	☐ Educate family about impact of asbestos on health. ☐ Get more information about asbestos testing at www.epa.gov/asbestos/ and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Do not disturb any surfaces which might contain asbestos. ☐ Consult with your state and local departments of health about asbestos.
Smoke alarm/CO alarm	☐ If no smoke alarms, educate about risks and local laws regarding the presence of smoke alarms. ☐ Counsel family to : ○ Install smoke alarms in home on every level and in every sleeping area. ○ Test them once a month. ○ Replace the batteries at least twice a year. ○ Replace alarms every 10 years. ☐ If no CO alarms, educate about risks and local laws regarding the presence of CO alarms. ☐ Review items in "Family To Do" column with family.	☐ If no smoke alarms, then: ○ Purchase smoke alarms. Ensure that there is an operational smoke alarm on every floor of the home and in every sleeping area. ○ Call local board of health for local smoke alarm requirements. Some states have laws regarding presence of smoke alarms. ☐ If no CO alarms, then: ○ Make sure to purchase CO alarms which log peak levels. Ensure that there is an operational CO alarm on every floor of the home. ○ Call local board of health for local CO alarm requirements. Some states now have laws regarding presence of CO alarms.
Tobacco Smoke Exposure	☐ Educate about risks of environmental tobacco smoke (ETS) to children. ☐ Get more information about ETS at http://www.epa.gov/smokefree/index.html and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Choose not to smoke in your home and car and do not allow family and visitors to do so. Infants and toddlers are especially vulnerable to the health risks from secondhand smoke. ☐ Do not allow childcare providers or others who work in your home to smoke. ☐ Until you can quit, choose to smoke outside. Moving to another room or opening a window is not enough to protect your children. ☐ Get help to stop smoking. Refer to EPA Smokefree Home pledge website www.epa.gov/smokefree and contact local smoking cessation services.

Home Environment		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Other Irritants (scents, potpourri)	☐ If air fresheners present, educate as follows: ○ Many air fresheners have volatile organic compounds (VOC) which trigger asthma. Avoid these products whenever possible. ☐ Get more information about VOCs at http://www.epa.gov/iaq/voc.html and provide to family. ☐ Review items in "Family To Do" column with family.	☐ Remove air fresheners from home.
Cleaning	☐ Educate about benefits of wet mopping. ☐ Review items in "Family To Do" column with family.	☐ Avoid dry mopping or sweeping which makes dust airborne and may trigger an asthma exacerbation. Use wet mopping instead
Drinking Water Source – Public water supply	☐ Get more information about water testing at www.epa.gov/safewater/labs ☐ Review items in "Family To Do" column with family	☐ Test water for lead. Contact local or state department of health for water testing information. ☐ Find out if the public water supplier has notified consumers of any violations of health-based standards in the last year.

Home Environment (continued)		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Drinking Water Source – Household well water	☐ Ask these additional questions: ○ Is the wellhead protected and well constructed according to state or other requirements/specification? ○ Is water tested annually for bacteria and, if pregnant woman or infants in household, nitrates, and okay? ○ Is water tested annually, contaminants detected and alternate source used (appropriate filter or bottled water)? ○ Is water tested annually, contaminants detected, but alternate source not used? ○ Has the water been tested within the last year? ○ Are there noticeable changes in water taste, odor, color or clarity? (In this case, especially if pregnant woman or infant is in the household, recommend testing more than once a year). ○ Has there been a chemical or fuel spill leak near water supply? (If yes, recommend testing for chemical contaminants, such as volatile organic compounds). ☐ Get more information about water testing at www.epa.gov/safewater/labs ☐ Review items in "Family To Do" column with family.	☐ Test water for lead. Contact local or state department of health for water testing information.
Mold	☐ See "Mold and Musty Odor" recommendations above. ☐ Make sure fans in bathroom and kitchen vent to the outside, not just in to walls. The goal is to take moisture out of home. ☐ Review items in "Family To Do" column with family.	☐ See "Mold and Musty Odor" recommendations above.
Damage	☐ Educate about mold risks as they relate to damage. ☐ If family owns home, then counsel to change behaviors. ☐ If family rents home, then counsel them to talk with their landlord. ☐ Review items in "Family To Do" column with family.	☐ If homeowner, then make necessary repairs. ☐ If renter, then talk with your landlord about needed repairs. Consider calling the local board of health for possible code violations.

Sleeping Area		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Mattress covers	☐ If patient is allergic to dust mites, educate as follows: ○ Use allergen impermeable mattress covers with zippers on beds and pillows. ☐ Review items in "Family To Do" column with family.	☐ If symptomatic, get allergen testing to determine if you are allergic to dust mites.
Carpet	☐ Review items in "Family To Do" column with family.	☐ Clean wall to wall carpet with vacuum weekly. ☐ Shake area rugs outside weekly. ☐ If carpet is more than 8 years old, consider replacing it with smooth wipeable flooring to reduce dust exposure. (8 year number came from Megan Sandel. Need to determine if that is number used by others too.)
Dust catchers	☐ Review items in "Family To Do" column with family.	☐ Reduce dust with less clutter. ☐ Seal clutter in bags or boxes.
Windows	☐ If patient is allergic to dust mites, review items in "Family To Do" column with family.	☐ If symptomatic, get allergen testing to determine if you are allergic to dust. ☐ Use window treatments that are wipeable. ☐ Avoid curtains and drapes to reduce excessive dust exposure.
Home Safety		
General Safety		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Renovation/remodeling	☐ See "Age of Home" above. ☐ Review items in "Family To Do" column with family.	☐ See "Age of Home" above. ☐ If the home was built pre-1978 and there is a child less than six years old: ○ get a lead paint inspection or risk assessment. ○ repair any lead hazards based on state and local regulations and requirements. Consult with state CLPPP. ☐ If the home was built pre-1978 and there is no child less than six years old: ○ consult with the CLPPP at your state and local departments of health about lead-safe renovation. ○ Change behaviors, such as modifying dust generating techniques and containing the work area.
Stairs, walls, railings, porches, lighting	☐ If family owns home, then counsel to change behaviors, such as making minor repairs to fix loose railings. ☐ If family rents home, then counsel them to talk with their landlord. ☐ Review items in "Family To Do" column with family.	☐ If homeowner, then make necessary repairs. ☐ If renter, then talk with your landlord about needed repairs. Consider calling the local board of health for possible code violations.
Poison control	☐ Provide national poison control number 1-800-222-1222 to family. ☐ Review items in "Family To Do" column with family.	☐ Post the national poison control number 1-800-222-1222 near telephone.

General Safety (continued)		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Family fire escape plan	☐ Counsel to change behaviors, such as develop a family safety plan. ☐ Get more fire safety information at http://www.usa.safekids.org/content_documents/fire_checklist.pdf ☐ Review items in "Family To Do" column with family.	☐ Develop a family safety plan. ☐ Need to know two ways out of the house. ☐ Need to have a place to meet after you are outside the house. ☐ Teach children the family safety plan for escaping your home in a fire and practice it
Electrical appliance	☐ Counsel to change behavior. ☐ Review items in "Family To Do" column with family.	☐ Do not use electrical appliances near water.
Matches and lighters	☐ Counsel to change behavior. ☐ Review items in "Family To Do" column with family.	☐ Do not store matches and lighters where children can reach them.
Exterior environment	☐ If abundant trash and debris, counsel family about waste management. ☐ If waste containment is the problem, counsel family to talk with landlord. ☐ See "Infestations" above. ☐ If the home was built pre-1978, contact the childhood lead poisoning prevention program (CLPPP) at your state and local departments of health for information about chipping, peeling paint. See "Age of Home" above. ☐ Review items in "Family To Do" column with family.	☐ See "Infestations" above. ☐ See "Age of Home" above.
Young Children		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Hot liquids/cleaning supplies/medicines	☐ Counsel to change behaviors. ☐ Review items in "Family To Do" column with family.	☐ Do not have hot liquids, cleaning supplies, or medicines within a child's reach.
Lead testing for children less than 6 years old	☐ If the home was built pre-1978, counsel the family to have the child's blood tested for lead. ☐ See "Age of Home" above. ☐ Review items in "Family To Do" column with family.	☐ Contact the childhood lead poisoning prevention program (CLPPP) at your state and local departments of health about lead testing resources. ☐ See "Age of Home" above.
Child watched by an adult while in tub	☐ Counsel to change behavior. ☐ Educate family about importance of not leaving children unattended in the tub. ☐ Review items in "Family To Do" column with family.	☐ Do not leave children unattended in the tub.
Hot water temperature	☐ Educate family about dangers of scalding. ☐ Review items in "Family To Do" column with family.	☐ Set hot water temperature to <120 F
Toddler gates	☐ Counsel family to install non-accordion toddler gates at the top and bottom of stairways. ☐ Review items in "Family To Do" column with family.	☐ Contact local injury prevention program to determine whether there are toddler gate resources available. ☐ Install non-accordion toddler gates at the top and bottom of stairways.

Young Children		
CONCERN	**NURSE TO DO**	**FAMILY TO DO**
Crib mattress	☐ Counsel family that crib mattress should fit snugly next to the crib so that there is no gap. ☐ If two adult fingers can be placed between the mattress and the crib, then counsel the family to immediately replace the mattress. ☐ Review items in "Family To Do" column with family.	☐ Put your baby to sleep in a crib with a firm, flat mattress and no soft bedding underneath. ☐ Ensure that your crib mattress fits snugly next to the crib so that there is no gap.
Window guards	☐ Counsel family about window safety. ☐ Contact local injury prevention program to determine whether there are window guard resources available. ☐ Review items in "Family To Do" column with family.	☐ Contact local injury prevention program to determine whether there are window guard resources available. ☐ Install window guards.
Window blind cords	☐ Counsel family to keep window blind cords out of children's reach and to purchase childproofing items for cord safety. ☐ Review items in "Family To Do" column with family.	☐ Keep window blind cords out of children's reach ☐ Purchase childproofing items for cord safety.

National Center for Healthy Housing

Pediatric Environmental Home Assessment Scenario

The scenario is fictional. The photos are taken from a variety of homes to highlight key issues.

For the sake of the exercise, take on the role of a public health nurse conducting a pediatric environmental home visit.

It is a warm summer day and you are going out on a home visit to see a family. The family has a six-year old child who has, and is being treated for, asthma. The mom has concerns about recent exacerbations in her child's asthma and the need for more frequent use of "rescue" inhalers.

You note that the family lives in a multi-family building in an urban neighborhood. The building appears to have been built in the late 1950s. That is consistent with other buildings in the neighborhood. Given its urban location, you know that the home is connected to a public water system.

As you go along, you make notes and check off any relevant information on the PEHA Survey form. Let's get started!

Welcome and Introductions

- View "Welcome and Introductions" video clip (7.5 MB).
- View photos of basement conditions.
- View photos of outside conditions.

As you talk further, the mom reports that she is a Section 8 tenant. When she moved in, she says the landlord told her that the house was built in 1958 and that lead hazard control work was completed before she moved in 18 months ago. She could not remember getting any booklet or warnings about lead when she signed her lease.

You ask the mom about other general housing characteristics. She knows there is a basement but has not been in there. She says she has seen the oil truck connect up to the fittings on the side of the house. She shows you the unlocked door to the basement in the common area. You check out the basement.

The mom says that the oil heat can be hard to control in the winter. Some rooms are too hot and others are too cold. She sometimes has to open windows to make the rooms comfortable.

You observe, and the mom reports, that there are no pets in the home.

The mom is focused on the construction dust and mice. She says she has not seen any mold. You follow along on the PEHA Survey Form and ask about other pests. The mom reports no trouble with cockroaches, rats, or bedbugs.

You ask about asbestos and radon. The mom reports that she has no knowledge about whether the building has been tested or treated.

You do not observe any air fresheners or scented candles present, but you ask about their use. The mom confirms that she does not use those items because they aggravate her child's asthma.

Next you do a kitchen walkthrough with the mom.

Kitchen

- View "Kitchen Walkthrough" video clip (5.8 MB).
- View photos of other kitchen conditions.

You review the PEHA Survey Form and ask to move on to the bedroom and bathroom.

Living Room Walkthrough and Neighborhood Review

- View "Living Room Walkthrough and Neighborhood Review" video clip (3.2 MB).
- View photos of living room conditions.

You note the active construction outside and the dust that is accumulating in the window sill even though the window is closed. You also note that there are no window guards on the windows and that the blinds have looped cords.

You ask the mom when was the last time the young children were tested for lead. Mom notes that it was within the last year and the results were less than 10.

You sit down again with the mom to review home safety questions. You provide her with a poison control hotline sticker to place on the phone. You ask about fire safety issues. She notes that there is no smoking allowed in the house and matches are stored in a high, safety-locked cabinet. The family does not have a formal fire escape plan.

The mom reports that the hallway lighting is good. She has no safety concerns about lighting. In the kitchen you note the coffee maker and tea kettle. You ask about the child's access to hot liquids. The mom notes that her son is older and is aware that he should not touch hot things. You ask the mom if she knows what the hot water temperature is set at. She does not know.

Bedroom and Bathroom

- View "Bedroom and Bathroom Walkthrough" video clip (6.6 MB).
- View photos of bedroom conditions.
- View photos of bathroom conditions.

You ask the mom about the use of humidifiers in the bedroom. She notes that she sometimes uses them in the winter because the air gets too dry from the hard to control heat.

As you talk further, the mom confirms that the bathroom fan does function although it is a bit noisy. You observe a hair dryer on the edge of the sink. You ask the mom about adult supervision when her child is bathing. She notes that she is right there most of the time but may sometimes leave the room to grab a towel or item of clothing for the child.

Medication Review and Wrap-up

- View "Medication Review and Wrap-up" video clip (7.0 MB).

National Healthy Homes Training Center and Network

Healthy Homes Maintenance Checklist

The following checklist was developed for the Healthy Homes Training Center and Network as a tool for healthy home maintenance. A healthy home is one that is constructed, maintained, and rehabilitated in a manner that is conducive to good occupant health.

To maintain a healthy home, occupants should keep it dry, clean, well-ventilated, free from contaminants, pest-free, safe and well-maintained. Good home maintenance can act to reduce allergens, prevent illness, and reduce injury from accidents. This checklist provides basic guidelines; items may need to be checked more often depending on local conditions and manufacturer suggestions.

Developed for the National Healthy Homes Training Center by Terry Brennan and Ellen Tohn, technical advisors to the National Center for Healthy Housing.

Yard & Exterior	Spring	Fall	Annual	As Needed	Pro Needed?
Water drains away from house	◉				
No trip, fall, choking, sharp edge hazards	◉	◉			
Fence around pool intact	◉	◉			
Check for signs of rodents, bats, roaches, termites	◉	◉			
Drain outdoor faucets and hoses		◉			
Clean window wells and check drainage	◉	◉			
Clean gutters and downspouts	◉	◉			

Basement & Crawlspace	Spring	Fall	Annual	As Needed	Pro Needed?
No wet surfaces, puddles	◉	◉			
Sump pump and check valve working	◉	◉			
Floor drain working	◉				
Vacuum basement surfaces	◉				
Check for signs of rodents, bats, roaches, termites		◉			

Exterior Roof, Walls, Windows	Spring	Fall	Annual	As Needed	Pro Needed?
Shingles in good condition	◉				
Check chimney, valley, plumping vent, skylight flashing	◉				
Make sure gutters discharge water away from building	◉				
Check attic vents		◉			
Check attic for signs of roof leaks	◉				
Check for icicles and ice dams			winter		
Look for peeling paint	◉				
Look for signs of leaks where deck attaches to house	◉				
Check below window & door that flashing intact	◉				
Repair broken, cracked glass		◉			
Look for signs of leaks at window and door sills	◉				
Clean dryer vent	◉	◉			
Check exhaust ducts are clear	◉	◉			

Maintenance Checklist continued on next page

Interior Walls, Ceilings, Windows, Doors

	Spring	Fall	Annual	As Needed	Pro Needed?
Check for signs of water damage			●		
Check operation of windows and doors	●				
Lubricate and repair windows and doors				●	

Plumbing, Fixtures and Appliances

	Spring	Fall	Annual	As Needed	Pro Needed?
Check washer hoses-connections			●		
Check dishwasher hoses for leaks			●		
Check toilet supply/shut-off valve			●		
Clean & check refrigerator drip pan-icemaker connections			●		
Check shower-tub surrounds for signs of damage			●		
Check traps and drains under sinks, tubs, showers for leaks			●		
Check hot water heater for leaks		●			
Check boiler for leaks		●			
Check water main/meter or well pump for leaks or sweating		●			
Check water main/meter or well pump for leaks or sweating		●			
Clean septic tank			2 yrs		
Check drain and supply time for leaks	●	●			
Check bath and kitchen fans operation	●	●			

HVAC Equipment - Replace filters

	Spring	Fall	Annual	As Needed	Pro Needed?
Warm air furnace (merv 8)		●			
Air conditioner (central air merv 8)	●				
Dehumidifier	●				
Outdoor air to return to heat recovery ventilation		●			

Appliances

	Spring	Fall	Annual	As Needed	Pro Needed?
Clean kitchen range hood screens				●	
Clean dryer vents and screens	●				
Clean exhaust fan outlets and screens	●				
Clean outdoor air intakes and screens		●			
Clean air conditioning coils, drain pans	●				●
Clean dehumidifier coils, check operation	●				
Clean and tune furnaces, boilers, hot water heaters		●			●
Clean and tune ovens and ranges		●			●

Electrical Equipment

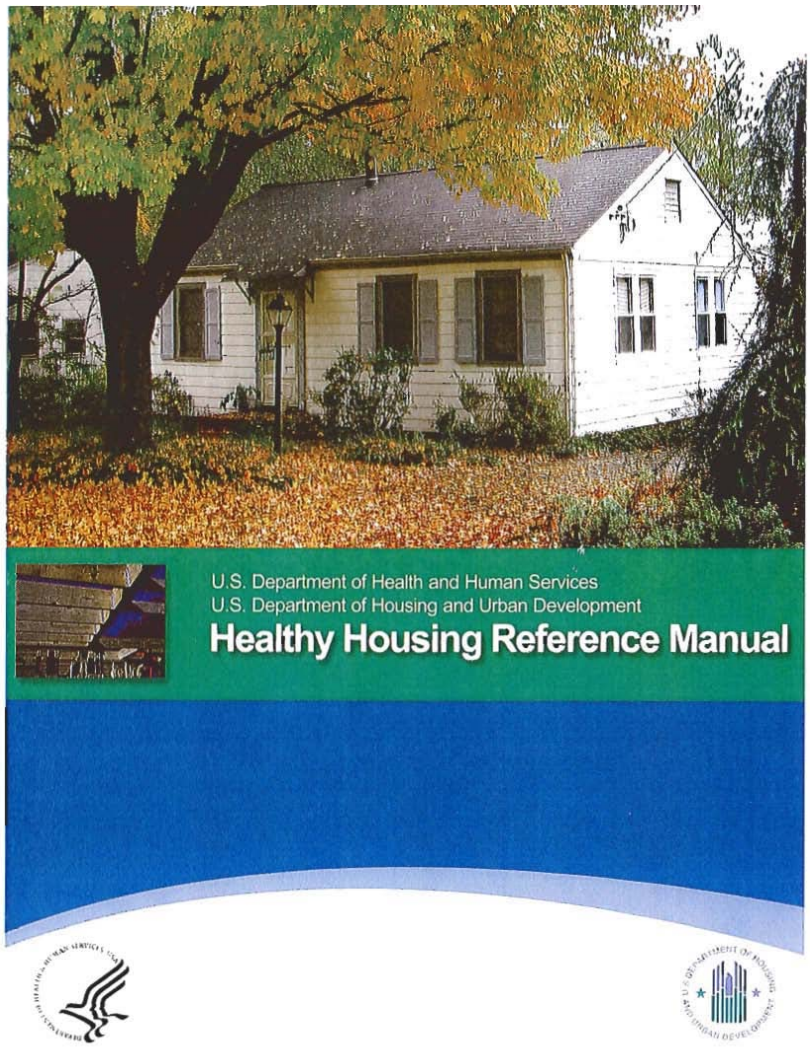
	Spring	Fall	Annual	As Needed	Pro Needed?
Check for damaged cords	●	●			
Test ground fault interrupters	●				
Test outlets for proper hot, neutral and ground			once		
Check smoke and CO alarms	●	●			

Garage

	Spring	Fall	Annual	As Needed	Pro Needed?
Ensure storage of fuel cans	●	●			
Proper operation of garage door safety shut-off	●	●			
Check for signs of water damage	●				
Check for signs of rodents, bats, roaches, termites	●	●			

Attic

	Spring	Fall	Annual	As Needed	Pro Needed?
Check for signs of rodents, bats, roaches, termites		●			
Check for water damage		●			
Ensure insulation in place		●			
Check that fans still exhaust to outdoors (check ductwork connections)			●		



National Center for Healthy Housing

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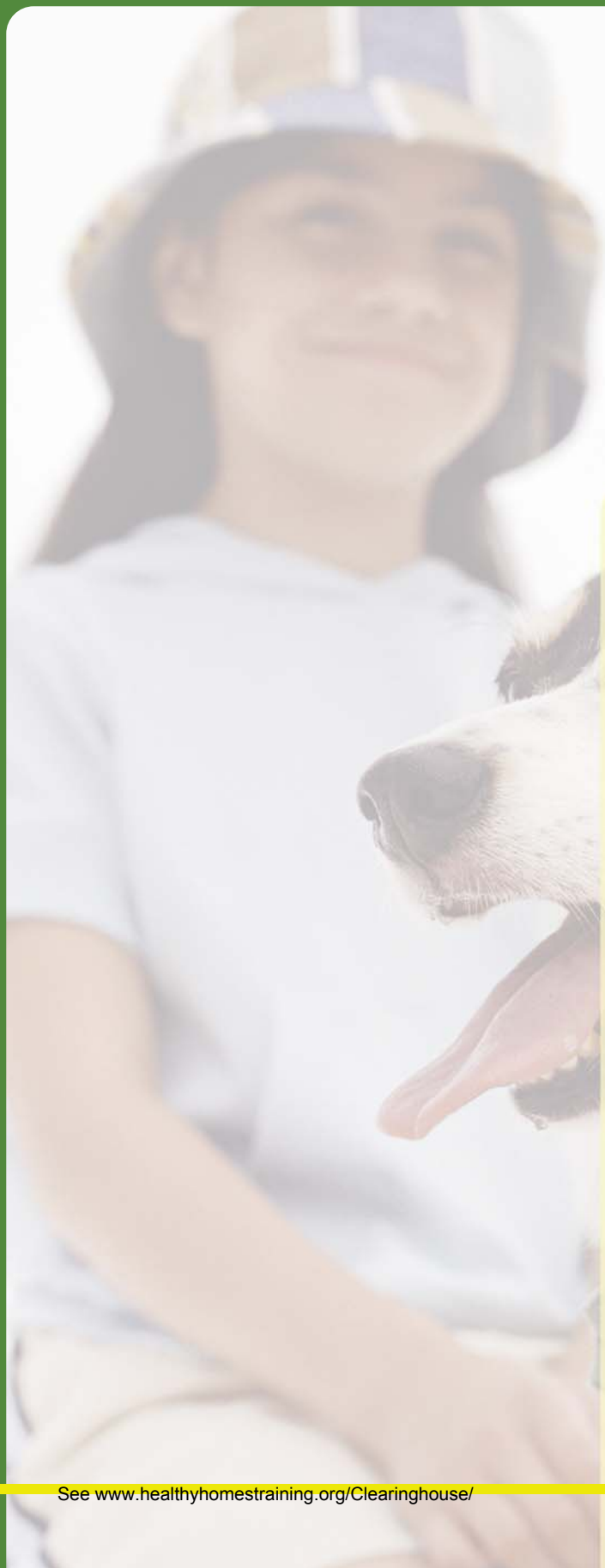
ALLERGY

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control



"Allergic diseases can be controlled; symptoms can be prevented or minimized."

American Academy of Allergy, Asthma and Immunology, "The Allergy Report"

Did you know...?

- As many as 40 or 50 million people in the United States suffer from allergies?[1]
- Allergies cause swollen eyes, itching skin, dripping noses, light-headedness and even death?

What is it?

An allergy is a strong reaction by your body's immune system to something that would normally be harmless—a food, plant, or medicine. Common reactions include a stuffy nose, itchy eyes, or a skin rash. Severe allergic reactions (see below) require immediate medical attention.

Many people who have allergies also have asthma. Allergic reactions may trigger asthma attacks, where a swelling and tightening of your airways that makes it difficult to breathe (see "Asthma" fact sheet).

Signs of Allergies and Allergic Reactions include:

- Asthma, shortness of breath, cough, chest tightness or wheezing (See "Asthma" fact sheet)
- Itchy, watery eyes
- Itchy, inflamed or runny nose
- Hives or itchy rash on skin
- Dark circles under and around eyes
- Recurring headache
- Diarrhea or stomach cramps
- Anaphylaxis (a severe reaction) may be life-threatening. Symptoms include: swelling, tingling in the mouth, and a red, itchy rash, as well as light-headedness, shortness of breath, severe sneezing, stomach cramps, and loss of blood pressure. If these symptoms are present, go immediately to a doctor or emergency room for treatment.

continued on back

ALLERGY

Types of allergies

There are many types of allergies. The following are some of the most common:

Indoor	Outdoor	Foods	Medications	Insect Stings and Bites	Contact with Skin
■ dust ■ dust mites ■ mold ■ pets (most often animal skin flakes or "dander")	■ pollen (from flowering trees and grass) ■ mold	■ milk ■ citrus fruits ■ eggs ■ peanuts ■ wheat ■ fish & shellfish	■ antibiotics (like Penicillin) ■ anti-seizure drugs ■ anesthetics	■ bees ■ wasps ■ hornets ■ yellow jackets	■ plants (like poison ivy) ■ cosmetics ■ skin-care products ■ jewelry ■ latex (gloves or condoms)

What you can do

Know your allergies, and know what to avoid. Not everyone is allergic to the same things!

- Contact your doctor about any unusual reactions to food, plants, medicines, or other items.
- Avoid contact with things you know trigger allergies.
  - Avoid being outside or having the windows open when pollen counts are high.
  - Read food labels carefully to avoid ingredients that cause reactions.
  - Choose medicines and home-care products carefully.
  - Remove carpet or vacuum often to avoid animal dander.
- Keep a clean home (for more tips, see "Asthma" fact sheet).
  - Control pests such as mice and cockroaches.
  - Vacuum floors and upholstery often and consider removing carpet.
  - Avoid having mold, cigarette smoke, pesticides, and chemicals inside the house.
  - Keep pets out of the bedrooms of family members who are allergic to them.
- In the event of a severe allergic reaction, seek emergency medical attention immediately.

For more information . . .

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

Other Federal Resources

US Centers for Disease Control and Prevention
www.cdc.gov/od/oc/childhealth

US Environmental Protection Agency
www.epa.gov/children

Other Resources

American Academy of Allergy, Asthma, and Immunology (AAAAI)
www.aaaai.org

Asthma and Allergy Foundation of America
www.aafa.org

The Allergy & Asthma Network: Mothers of Asthmatics (AANMA)
www.aanma.org

Ask your doctor or contact your local or state department of health.

Keeping a clean home can reduce some allergens

[1]Source: American Academy of Allergy, Asthma and Immunology (AAAAI). *The Allergy Report: Science Based Findings on the Diagnosis & Treatment of Allergic Disorders,* 1996-2001

ASTHMA

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control

"The important thing to remember is that you can control your asthma."

Centers for Disease Control "Basic Facts About Asthma"

Did you know...?

- Over 20 million people in the United States suffer from asthma?[1]
- Over 6.3 million children under 18 report having asthma?[2]
- There were 75% more cases of asthma in 1994 than in 1980?[3]
- Asthma is the third leading cause of hospitalization in the United States?[4]

What is it?

Asthma is a lung disease. It causes people to wheeze, cough, be short of breath, and sometimes even die. People with asthma can suffer from frequent periods of difficulty breathing called "asthma attacks." During an attack, the airways swell, the muscles around them tighten, and the airways produce thick yellow mucous.

Asthma is not contagious, but it does run in families, so if parents have asthma, their children are more likely to have it, too.

Children, particularly those living in urban areas and crowded or unclean conditions are especially at risk for developing asthma. "African-American children living in low-income families tend to have more severe asthma and are at greater risk of death."[5]

Each person is different, but many things (called asthma "triggers") can cause asthma attacks. These can be found both outdoors and indoors and include:

- Cold weather
- Pollen
- Exercise
- Stress
- Dust and dust mites
- Cockroaches
- Mold
- Pet dander (skin flakes)
- Rodents
- Tobacco smoke
- Air fresheners

continued on back

ASTHMA

Mold is a common asthma trigger.

Photo by: January E. Jones, Improving Kids' Environment

What can you do?

Because there is no cure for asthma, **it is most important to work on preventing attacks.** There are three major categories of prevention:

Keep a clean home.

- Make sure that your home is free of dust, mold, smoke, and other potential triggers.
- Vacuum often—HEPA (High Efficiency Particle Air) filters remove dust best.
- Keep foods stored in tightly sealed containers to avoid attracting cockroaches and rodents by keeping food in tightly sealed containers.
- Clear crumbs, drips, spills, and dirty dishes immediately.
- Identify and quickly fix water leaks in your home.

Keep people with asthma away from dust, dust mites, and smoke.

- Use zippered "allergen resistant" mattress and pillow covers to keep dust mites out of sleeping spaces.
- Keep pets outdoors or away from sleeping areas; clear hairs from carpets and furniture.
- Quit smoking, or smoke only outside your home and car. Always keep tobacco smoke away from children.
- Change bed sheets often.
- Keep people with asthma out of a room while vacuuming or dusting.

Get medical advice and follow the doctor's instructions.

- Get medical attention for breathing problems.
- Get emergency medical care for bad attacks of shortness of breath or wheezing.
- Take all prescribed medication, either to prevent attacks or to lessen the symptoms.
- Find out what allergies you have so you can avoid these potential asthma triggers.

For more information . . .

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

Other Federal Resources

US Centers for Disease Control and Prevention
www.cdc.gov/od/oc/childhealth

US Environmental Protection Agency
www.epa.gov/children

Other Resources

American Academy of Allergy, Asthma, and Immunology (AAAAI)
www.aaaai.org

Asthma and Allergy Foundation of America
www.aafa.org

The Allergy & Asthma Network **Mothers of Asthmatics (AANMA)**
www.aanma.org

Ask your doctor or contact your local or state department of health.

Cockroaches can trigger asthma. Use traps, gel bait, and cleaning to deal with roaches.

Photo by: January E. Jones, Improving Kids' Environment

[1]"Asthma Prevalence, Health Care Use, and Mortality, 2000-2001," National Center for Health Statistics, Centers for Disease Control and Prevention.

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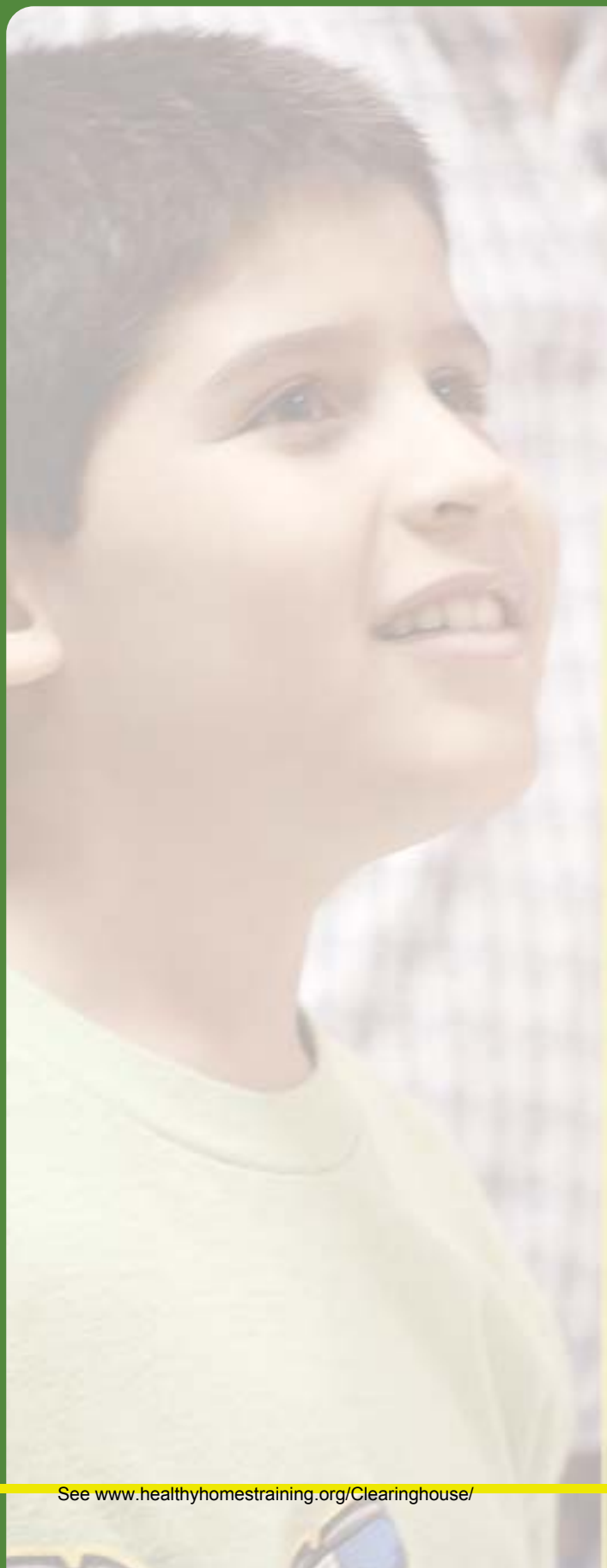
CARBON MONOXIDE

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control



"You can't see or smell carbon monoxide, but at high levels it can kill a person in minutes."

U.S. Environmental Protection Agency

Did you know...?

- Over 500 people in the United States die from accidental carbon monoxide (CO) poisoning each year?[1]
- Over 10,000 people seek medical attention for CO poisoning each year?[2]
- Infants, people with lung or heart disease, or people with anemia are more seriously affected?

What is it?

Carbon monoxide is a gas that cannot be seen, smelled or tasted, and can be fatal when breathed. The symptoms that occur with carbon monoxide poisoning are similar to those of the flu and allergies. These similarities often lead to an incorrect diagnosis, such as a migraine headache, stroke, food poisoning, or heart disease.

Carbon monoxide poisoning is caused by:

- Operating fuel-burning products such as electrical generators without proper ventilation. Some of these products may be used indoors near an open window, and others may not be used indoors at all. Look at the manufacturers' instructions before operating any fuel-burning device in your home.
- Car exhaust entering the home from the garage.
- Combustion equipment such as furnaces or hot water heaters that are not working properly or have blocked exhaust systems.

continued on back

CARBON MONOXIDE

Do not run you car in a closed garage.

What can you do?

- Make sure fuel burning appliances are installed by a professional and are working properly.
- Never run your car in a closed garage and move cars out of attached garages immediately after starting them.
- Never use a gas range or oven to heat a home.
- Choose vented appliances (like gas fireplaces) whenever possible.
- Have your heating systems and chimneys inspected and cleaned by a qualified technician every year.
- Replace dirty air filters on heating and cooling systems.
- Never run a generator, pressure washer, or any gasoline-powered engine inside a basement, garage, or other enclosed structure, even if the doors or windows are open, unless the equipment is professionally installed and vented.
- Never use a charcoal grill, hibachi, lantern, or portable camping stove inside a home, tent, or camper.
- Make sure there is good ventilation at all times – install proper ventilation for interior combustion appliances, and consider installing air exchangers or air conditioning for "tightly-sealed" homes.
- Install carbon monoxide detectors near sleeping areas.

For more information…

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

Other Federal Resources

US Centers for Disease Control and Prevention
www.cdc.gov/nceh/airpollution/carbonmonoxide/cofaq.htm

US Environmental Protection Agency
www.epa.gov/children

Other Resources

Healthy Indoor Air America's Homes
www.healthyindoorair.org/facts_co.html

Community Environmental Health Resource Center (CEHRC)
www.cehrc.org/tools/carbon/cobacmat.cfm

Ask your doctor or contact your local or state department of health.

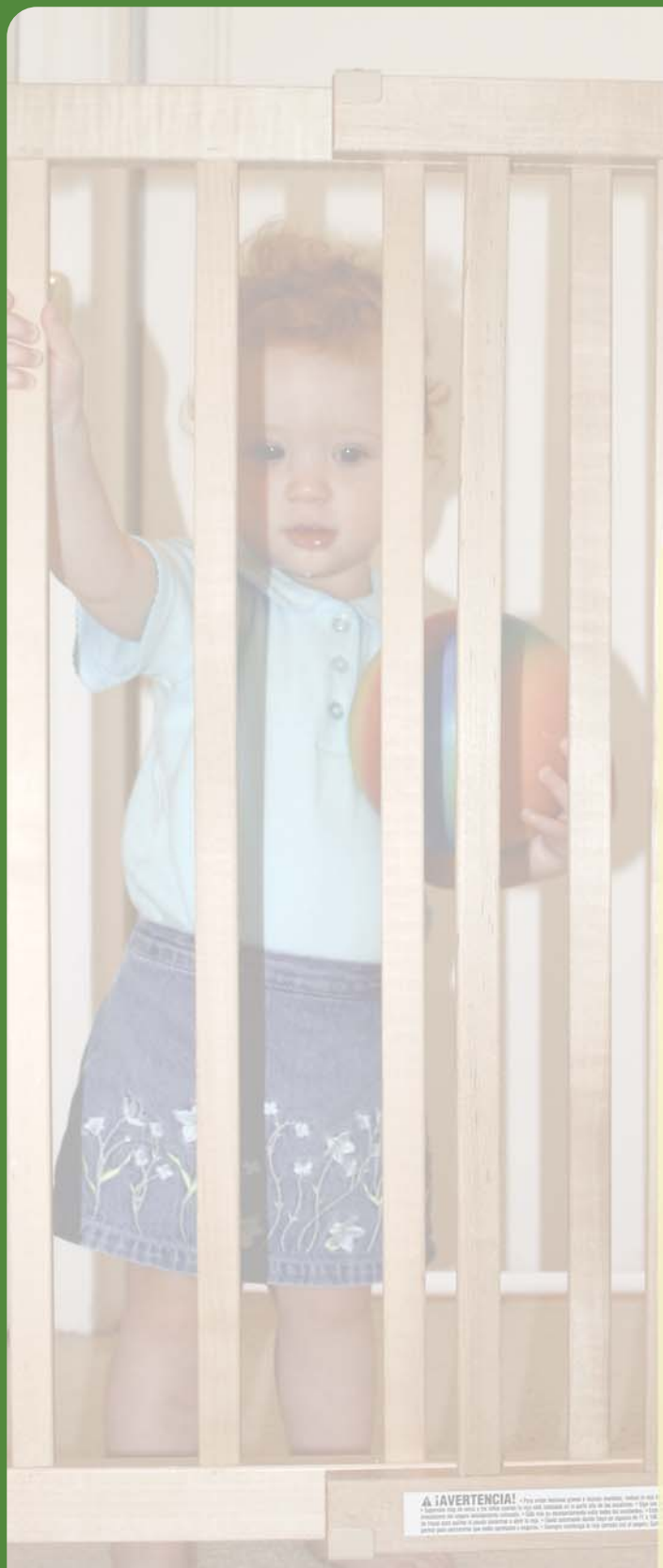
Install carbon monoxide detectors in your home.

[1]Centers for Disease Control and Prevention. "Carbon Monoxide Poisoning Fact Sheet" www.cdc.gov/nceh/airpollution/carbonmonoxide/cofaq.htm August 25, 2004

[2]Community Environmental Health Resource Center (CEHRC) "Carbon Monoxide Background Materials" www.cehrc.org/tools/carbon/cobacmat.cfm August 25, 2004

HOME SAFETY

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control



" There are simple steps you can take to help keep your loved ones safe in and around the home."

Home Safety Council

Did you know...?

- **Home accidents** kill one person every 16 minutes and injure one person every four seconds in the U.S.?[1]
- More than 1.2 million **poisonings** among children under age 5 were reported to U.S. poison control centers in 2002?[2]
- Nearly 40,000 children under age 14 are injured by **fires** each year?[3]

Home Safety includes preventing unintentional injuries. Unintentional injuries in the home include poisoning, fires and burns, choking, drowning, suffocation, strangulation, firearms, and falls, and they are all **preventable.**

What you can do

There are many small and easy things you can do to protect your family from injuries in the home, some of which are listed below. **Post emergency telephone numbers next to all phones** to make it as easy as possible to get help if someone gets hurt.

Poison

- **Read warning labels and follow storage directions on household products.** Poisonous products can include medicines, cleaning supplies, hair spray, and home repair materials.
- **Keep poisonous products out of children's sight and reach** on high shelves. Install child-proof latches on cabinets that do not have locks.

continued on back

HOME SAFETY

- **Store food and non-food products separately** to prevent confusion and protect your family from container contamination and toxic spills.
- **Always choose non-toxic alternatives when possible** and use products with child-resistant caps.
- **Never mix cleaning products together;** they may produce dangerous fumes (ammonia and bleach should never be mixed).
- **Install Carbon Monoxide (CO) detectors** in your home.
- **Flush expired medicines down the toilet** rather than throwing them in the garbage.
- **If it is necessary to use harsh chemicals, use them when children are not at home,** or at least are in a different room. Always wear gloves when handling products that could be toxic and follow all manufacturers' instructions.

Fires and Burns

- **Install smoke detectors on every floor of your home near every bedroom.** Test detectors every month and change their batteries every year. Never disable smoke detectors.
- **Develop a family escape plan.**
- **Keep matches, lighters, and candles out of children's reach.** Never smoke in bed. It is the leading cause of fire-related deaths.
- **Keep anything that can catch fire away from fireplaces, heaters, and radiators.** Replace frayed electrical wires.
- **Take care to avoid kitchen fires and burns.**
  - Stay in the kitchen while cooking.
  - Turn pot handles toward the inside of the stove so children cannot grab them.
  - Install ground-fault circuit interrupters (GFCIs) in kitchens and bathrooms.
- **Set water-heater thermostats below 120° F (50° C).** Always test the water before bathing yourself or your child.

Drowning, Choking, Suffocation, and Strangulation

- **Never leave children alone near water,** including bathtubs, buckets, swimming pools, rivers, and the ocean. Learn and practice First Aid and CPR.
- **Use child-proof fencing** around all swimming pools and hot-tubs.
- **Avoid toys for children under 3 years of age that are smaller than 2 inches long and 1 inche wide.** Toys for young children should never have small or removable parts that could be choked on.
- **Avoid window blinds with looped cords,** which may cause strangulation if not stored out of children's reach.
- **Keep plastic bags and drawstring cords away from children.**

Falls and Other Injuries

- **Keep your floors free of anything that may cause tripping,** such as toys, shoes, or magazines.
- **Use stools, ladders and stepladders carefully.**
- **Make sure that your home is well lit.**
- **Use guards on windows and safety gates near stairs** to keep children from falling
- **Follow manufacturers' instructions for storing and using lawn equipment or chemicals.**
- **Wear protective gear on eyes and ears when using power tools.**
- **Keep sharp or electronic kitchen and bathroom items out of children's reach.** Keep electric appliances away from water.
- **Always keep firearms well secured.** Firearms should always be locked, unloaded, and stored out of reach. Store ammunition in a separate, locked location.

For more information . . .

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health and safety hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

Other Federal Resources

US Centers for Disease Control and Prevention
www.cdc.gov/od/oc/childhealth

US Environmental Protection Agency
www.epa.gov/children

Other Resources

National Safe Kids Campaign
www.safekids.org

National Safety Council
www.nationalsafetycouncil.org

Home Safety Council
www.homesafetycouncil.org

Emergency Resources

National Poison Control Center hotline: 1-800-222-1222.
For other emergencies (fire, drowning, choking, falls, etc.) call 911. In areas without 911 service, memorize your fire department's emergency phone number. In case of fire, dial 911 from outside your home.

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[1]National Safety Council "Report on Injuries in America, 2002" www.nationalsafetycouncil.org/library/report_injury_usa.htm August 25, 2004

[2]National Safe Kids, "Poison" www.safekids.org/tier2_rl.cfm?folder_id=176 August 25, 2004

[3]National Safe Kids, "Fire" www.safekids.org/tier2_rl.cfm?folder_id=171 August 25, 2004

LEAD

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control

"Despite progress, lead poisoning remains one of the top childhood environmental health problems today."

President's Task Force on Environmental Health Risks and Safety Risks to Children

Did you know...?

- Many homes built before 1978 have lead-based paint?
- 3.8 million homes in the United States have peeling or chipping lead-based paint or high levels of lead in dust?
- Infants, children under six, and pregnant women should have their blood tested for lead?
- In the United States, children from poor families are eight times more likely to get lead poisoned?

What is it?

Lead is a toxic metal used in a variety of products and materials. When lead is absorbed into the body, it can cause damage to the central nervous system and vital organs like the brain, kidneys, nerves, and blood cells. Symptoms of lead poisoning include headaches, stomachaches, nausea, tiredness, and irritability, which may also occur with the flu and some viruses. Lead can also harm children without causing obvious symptoms. Both inside and outside the home, old, deteriorated paint releases lead, which mixes with dust and soil. Children who ingest lead or lead dust by putting their hands or other objects in their mouths, by eating paint chips, or by playing in lead-contaminated soil may become poisoned.

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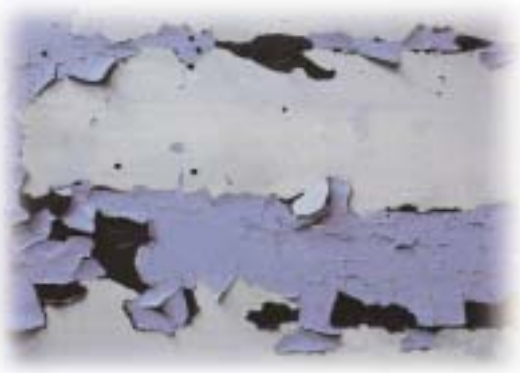
In homes built before 1978, treat peeling paint as a lead hazard.



What can you do?

1. **In your home, if it was built before 1978:**
   a. Have it checked for lead hazards by a professional (including the soil).
   b. Mop smooth floors (using a damp mop) frequently to control dust.
   c. Vacuum carpets and upholstery to remove dust, preferably using a vacuum with a HEPA filter or a "higher efficiency" collection bag.
   d. Take off shoes when entering the house.
   e. Pick up loose paint chips carefully then HEPA vacuum.
   f. Take precautions to avoid creating lead dust when remodeling, renovating, or maintaining your home.
2. **For your child:**
   a. Frequently wash your child's hands and toys to reduce exposure.
   b. Use cold tap water for drinking and cooking.
   c. Avoid using home remedies (such as arzacon, greta, or pay-loo-ah) and cosmetics (such as kohl or alkohl) that contain lead.
   d. Have your child's blood lead level tested at age 1 and 2. Children from 3 to 6 years of age should have their blood tested, if they have not been tested before and:
      i. They live in or regularly visit a house built before 1950;
      ii. They live in or regularly visit a home built before 1978 with on-going or recent renovations or remodeling; or
      iii. They have a sibling or playmate who has or did have lead poisoning.

For more information…

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

Other Federal Resources

U.S Department of Housing and Urban Development, Office of Healthy Homes and Lead Hazard Control (OHHLHC)
www.hud.gov/offices/lead or call (202) 755-1785 x. 104

The National Lead Information Center
1-800-424-LEAD (5323)
www.epa.gov/lead/leadpbed.htm

Centers for Disease Control and Prevention (CDC)
www.cdc.gov/nceh/lead/lead.htm

Environmental Protection Agency (EPA)
www.epa.gov/lead

U.S Occupational Safety and Health Administration (OSHA)
www.osha-slc.gov/SLTC/lead/index.html

U.S Consumer Product Safety Commission (CSPC)
www.cpsc.gov or call
1-800-638-8270

Other Resources

Dust created by opening and closing windows is a common lead hazard.

Photo by: January E. Jones, Improving Kids' Environment

Healthy Indoor Air for America's Homes
www.healtyindoorair.org/facts_lead.html

Community Environmental Health Resource Center (CEHRC)
www.cehrc.org/tools/lead/leaddust/background.cfm

Alliance for Healthy Homes
www.afhh.org or (202) 543-1147

National Center for Healthy Housing
www.centerforhealthyhousing.org

Parents Against Lead (PAL)
(773) 324-7824

MOLD

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control

"The key to mold control is moisture control."

U.S. Environmental Protection Agency

Does your home have...?

- Stains or discoloration on your walls, ceiling, or furniture?
- A damp or musty smell?
- Water problems like a leaky roof or water in the basement?

What is it?

Molds are alive. There are hundreds of thousands of different types of mold. They are living organisms that grow naturally, particularly in warm, damp, humid conditions where there is little air movement. Often called "mildew," molds are related to mushrooms and yeast but are much smaller—we can only see or smell mold when there is a large quantity. Mold can grow almost anywhere: on walls, ceilings, carpets, or furniture. Humidity or wetness, caused by water leaks, spills from bathtubs or showers, or condensation, can cause mold to grow in your home.

Mold produces "spores," tiny particles that float through the air. These can sometimes cause health problems. Mold does not affect everyone, and different people are affected differently when mold is breathed or inhaled. People who are allergic to mold may get *watery eyes, runny or stuffed noses, itching, headaches,* and may have *difficulty breathing.* Mold can also trigger *asthma attacks* (see "Asthma" fact sheet). Some molds produce toxins (poisons) that may be hazardous if people are exposed to large amounts of these molds.

continued on back

What can you do?

You cannot eliminate all mold spores from a home, but you can take the following steps to prevent and get rid of mold.

Prevent: keep your house clean and dry following steps to prevent and get rid of mold.

- Fix water problems such as roof leaks, wet basements, and leaking pipes or faucets.
- Make sure your home is well ventilated and always use ventilation fans in bathrooms and kitchens.
- If possible, keep humidity in your house below 50% by using an air conditioner or dehumidifier.
- Avoid carpeting in kitchens, bathrooms, and basements. Dry floor mats regularly.

Identify: find mold that might be growing in your home.

- Search for areas that have a damp or moldy smell, especially in basements, kitchens, and bathrooms.
- Look for water stains or colored, fuzzy growth on and around ceilings, walls, floors, window sills and pipes.
- Search behind and underneath materials such as carpeting, furniture, or stored items.
- Inspect kitchens, bathrooms, and basements for standing water, water stains, and patches of out-of-place color.

Respond: fix any water problems immediately and clean or remove wet materials, furnishings, or mold.

- Clean up spills or floods within one day.
- Dry all surfaces and fix the problem or leak to prevent further damage.
- Install a dehumidifier where there is high humidity.
- Replace contaminated components, such as drywall and insulation.
- Clean mold off non-porous surfaces with a weak solution of bleach and water.
- Throw away moldy materials that cannot be cleaned, such as carpet, upholstered furniture, drywall, and floorboards.
- When cleaning mold, protect yourself by wearing long sleeves, pants, shoes, and rubber gloves, as well as goggles and a face-mask.
- If you find a large area of mold (larger than the top of a twin-sized bed) or are allergic to mold, consider hiring a professional to clean it and fix the cause of the problem.

(For a list of mold-removal professionals, look under "Fire and Water Damage Restoration" in your telephone book.)

Moldy materials that cannot be cleaned should be thrown away.

For More Information…

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home. Additional information on mold can be found on a web site developed by HUD at www.healthy-homes.info

Other Federal Resources

EPA: Indoor Air Quality – Mold. "Mold Resources"
www.epa.gov/mold

CDC: National Center for Environmental Health, Mold
www.cdc.gov/nceh/airpollution/mold/

FEMA: Actions to Take Following a Flood
www.fema.gov/hazards/floods/

Other Resources

American Academy of Allergy, Asthma, and Immunology (AAAAI):
www.aaaai.org

American Industrial Hygiene Association
www.aiha.org/

Minnesota Department of Health, Mold
www.health.state.mn.us/divs/eh/indoorair/mold/

California Department of Health, Mold
www.cal-iaq.org

RADON

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control

"You can't see radon. And you can't smell it or taste it. But it may be a problem in your home"

U.S. Environmental Protection Agency

Did you know...?

- Radon is the second leading cause of lung cancer, after smoking?[1]
- Approximately 20,000 cancer deaths each year are caused by radon?[2]

What is it?

Radon is a radioactive gas that cannot be seen, smelled, or tasted and is found naturally around the country. When you breathe air containing radon, the sensitive cells in your airway are irritated, increasing your risk of getting **lung cancer**.

Radon is found in the dirt and rocks beneath houses, in well water, and in some building materials. It can enter your house through soil, dirt floors in crawlspaces, and cracks in foundations, floors, and walls. Once inside, radon gas can sometimes get trapped inside the house.

All houses have some radon, but houses next to each other can have very different radon levels, so the only way to measure your particular risk is to test your own house. Radon is measured in "picoCuries per liter of air," abbreviated "pCi/L." This measurement describes the number of radon gas particles in one liter of air. The amount of radon outdoors is usually around 0.4 pCi/L, and indoors is around 1.3 pCi/L. Even though all radon exposure is unhealthy, radon at levels below 4 pCi/L are considered acceptable. If your home has more than 4 pCi/L, you should take action to lower this level.

continued on back

What can you do?

Test your Home!

About 1 out of every 15 homes has a radon problem, and yours could be one of them! The only way to know for sure is to test your home. You can buy a radon test at a hardware store or order it by mail. There are two types of tests: short-term tests take 2 days, while long-term tests take around 90 days but give results that are slightly more accurate.

Follow all the instructions that come with your test kit. If possible during the test, keep your windows closed to keep air from escaping. Place your test kit in a room on the lowest level of your home that you use regularly, probably on the first floor or in the basement. When the test is done, send it to a lab to process your results.

Instead of doing the testing yourself, you can hire a professional tester to do it for you. Contact your state's radon office for a list of qualified testers.

Fix It!

It is possible to lower the levels of radon, and the risk of lung cancer, in your home. Most of the time, this will involve removing radon gas from underneath your concrete floor, crawlspace, or foundation before it can enter your home. This will require special knowledge and skills and you will need to hire a professional contactor to help you reduce the levels of radon in your home. If you are considering fixing your home's radon problem yourself, you should first contact your state radon office for guidance and assistance.

A few more things you can do

1. **Stop smoking** and discourage smoking in your home. Smoke increases the risk of lung cancer from radon.
2. **Increase air flow in your house** by opening windows and using fans and vents to circulate air. Natural ventilation in any type of house is only a temporary radon reduction approach because of the following disadvantages: loss of heat or air conditioned air, related discomfort and increased costs, and security concerns.
3. **Seal cracks in floors and walls** with plaster, caulk, or other materials designed to seal cracks and gaps.

Contact your state radon office for a list of qualified contractors in your area and for information on how to fix radon problems yourself. Always test again after finishing to make sure you've fixed your radon problem.

If you are buying a new home, ask whether radon-resistant construction techniques were used. It is almost always cheaper and easier to build these features into new homes than to add them later.

For more information . . .

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community.

Download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

More Federal Resources

US Environmental Protection Agency (EPA)
www.epa.gov/radon

Other Resources

State Radon Contacts
1-800-438-4318 (Indoor Air Quality Information Clearinghouse)

National Radon Hotline to order radon test kits
1-800/SOS-RADON (1-800-767-7236)

National Safety Council and EPA Radon Hotline with an operator to answer questions about radon
1-800-55RADON (1-800-557-2366)

Radon Fix-it Hotline
1-800-644-6999

Spanish Language Radon Hotline
1-800-725-8312

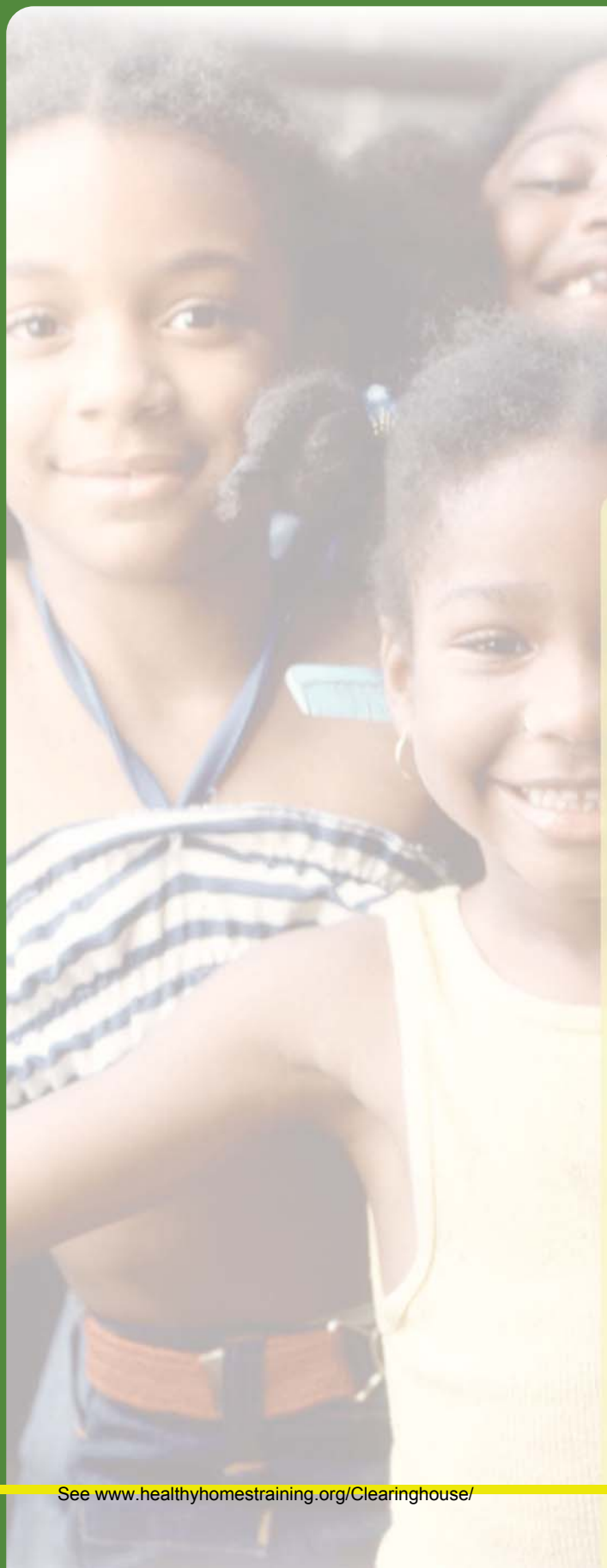
American Lung Association
www.lungusa.org

Radon test kits are available at hardware stores or by mail

[1]U.S. Environmental Protection Agency "Indoor Air- Radon" www.epa.gov/radon August 25, 2004
[2]U.S. Environmental Protection Agency "Assessment of Risks from Radon in Homes" www.epa.gov/radon/risk_assessment.html August 25, 2004

SAFE PEST CONTROL

U.S. Department of Housing and Urban Development • Office of Healthy Homes and Lead Hazard Control



"For years, cockroaches have defeated our best efforts to get rid of them. We sprayed and sprayed, but they always came back. Now we understand there are better methods and products that really work"

Environmental Health Watch

Did you know...?

- Many pesticides for home use are toxic?
- There are alternative pest management methods that limit the use of toxic substances?
- Mice, cockroaches, and cockroach "dust" can trigger asthma attack?

What is it?

Integrated pest management (IPM) is a way to remove pests, like cockroaches, mice, and rats from a home. IPM is a common sense approach that:

- Denies pests food, water, shelter and a way to enter the home.
- Uses baits and powders, such as gel baits, traps and borate powder.

Why use IPM?

- IPM is safer. IPM does not use as many harmful pesticides as traditional pest control.

  - Avoiding pesticides is especially important in homes. Pesticides can contain long lasting, toxic chemicals or lung irritants that cause asthma attacks. Children are among those most vulnerable to exposure. IPM strategies apply pesticides only as needed and use the least hazardous pesticides to control pests.

continued on back

Non-toxic traps can be part of an IPM strategy.

Photo by: January E. Jones, Improving Kids' Environment

- IPM works better. IPM is better at keeping the roaches and other pests away for long periods of time compared to spraying of pesticides or other poisons. IPM works by addressing the cause of the problem and taking a long-term approach to reducing pests. Using pesticides can cause pests to build up a resistance to the poison so that the chemicals do not work as well over time, and do not stop the pests from coming back to your home.

What you can do

Look. Pay attention to where there are pests in your home, how they enter, and how many there are. By watching and tracking pests in your home, you can better decide what actions to take.

Keep a clean home. Keeping a clean house is the best way to keep pests out. Some important things to pay attention to are:

- Clean-up food and drink spills right away.
- Remove clutter (such as cardboard boxes or paper) so pests have fewer places to hide.
- Put food in tightly sealed containers, such as plastic with tight lids. Do not leave open containers of food on counters or in cabinets. Put pet food dishes away overnight.
- Keep trash in a closed container and take it out frequently—every day if possible. Don't let trash pile up outside.
- Fix plumbing or other water leaks. Pests need water sources to survive.
- Seal cracks and holes. Use a caulk gun to seal cracks around baseboards, shelves, pipes, sinks, and bathroom fixtures.

Use roach baits properly and only if necessary. Place baits out of the reach of children and pets.

- Put the bait close to the pests' hiding places. It must be closer than other sources of food.
- Good spots for baits are next to walls, baseboards, under sinks, in cabinets and near plumbing fixtures. Place baits in areas of roach activity.
- Do not spray any pesticides. This will keep the pests away from the baits.

If needed, call a pest control professional who uses IPM practices. If you have taken all the steps described above and still have a pest problem, you may need a professional to help.

- If you live in an apartment or rent a home, speak to your landlord or property manager about using an IPM professional. Talk to other tenants about the importance of IPM for long-term solutions to your building's pest problems.
- IPM professionals utilize various methods to identify, monitor, and solve the pest problem without using lots of pesticides.

For more information…

Visit HUD's website at www.hud.gov/offices/lead for more information about addressing health hazards in homes or to learn if HUD has a Healthy Homes program in your community. From this website, you can download a copy of "Help Yourself to A Healthy Home" for more practical steps you can take to make your home a healthy home.

Other Federal Resources

US Centers for Disease Control and Prevention
www.cdc.gov/od/oc/childhealth

US Environmental Protection Agency
www.epa.gov/children

Other Resources

Environmental Health Watch has several resources on IPM and cockroach control
www.ehw.org

Children's Environmental Health Coalition's HeatlheHouse also has several resources on using IPM in the home
www.checnet.org/healthehouse/

Place baits near baseboards, out of reach from children.

Photo by: January E. Jones, Improving Kids' Environment