



# **BUILDING A FRAMEWORK FOR HEALTHY HOUSING**

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## **Healthy Housing Standards: Fragmentation or Harmonization?**

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**David E. Jacobs, PhD, CIH  
National Center for Healthy Housing  
September 2008**

# Outline

- Housing and the shared commons: The Framework
- Market forces and cost shifting between housing & health
- Strength of the evidence relating housing to health
- Housing intervention evidence
- Case Studies: Green Housing Rehab and Health
- Harmonizing healthy housing standards, overcoming existing fragmentation, and marketing healthy housing



# Florence Nightingale

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

Cited in Lowry, S, BMJ, 1991, 303, 838-840



# Miasma: Early Views of Disease



*The miasma that was thought to cause cholera was linked to the squalor of the poor.*



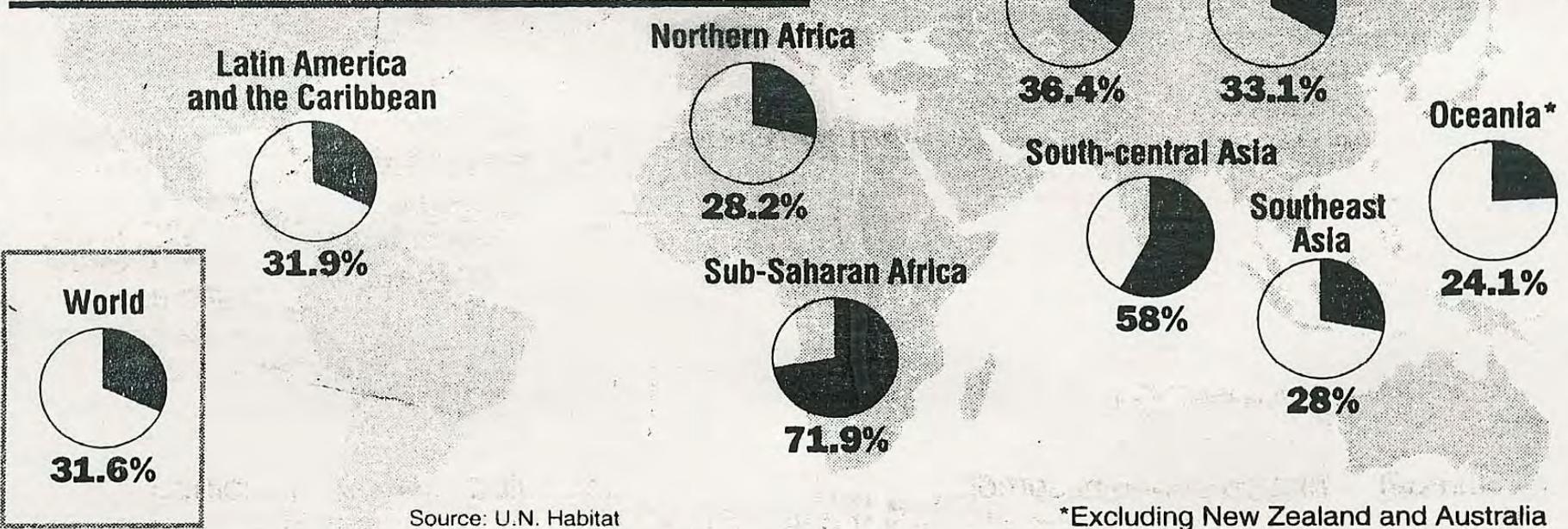
# Health in the Late 19<sup>th</sup> Century

- Challenge of Tuberculosis Seemed Insurmountable
- Lessons for Public Health Officials, Architects and Housers: Light, Fresh Air, Reduction in Crowding and Housing Regulation Work.
- With Improved Housing Conditions & Medical Interventions, Disease Rates Declined
- Reconnecting Housing & Health Still Works A Century Later



# URBAN MISERY

Almost one-third of urban dwellers in developing countries live in slums, with the percentage rising above one-half in sub-Saharan Africa.



Source: U.N. Habitat

\*Excluding New Zealand and Australia

The Washington Times



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## BRIEFING/GLOBAL ISSUES

**Decent housing is global goal****U.N. agency partners with Habitat group**By Marion Baillot  
THE WASHINGTON TIMES

**B**etween soaring interest rates and a monthly income of less than \$200, the only shelter the Verduguez family could afford in Cochabamba, Bolivia, was two tiny rooms in a run-down adobe-block house.

The walls are cracked, the stucco is falling and water leaks through the roof when it rains. Romulo, 45, and Adela, 41, struggle to find enough room for their six children, ages 3 to 21, to sleep.

"With no bathroom in the house, our family has to go down the street to public toilets and showers shared by 80 other people. Everybody pays 32 cents each time to use the facilities. Water from the public system is available only once a week," said Mr. Romulo.



Volunteers participated in "blitz builds" of Habitat for Humanity homes in June 2003, in LaGrange, Ga. Representatives of Habitat for Humanity International and the U.N. Human Settlements Program signed an agreement last week to combine their efforts to improve housing for the poor and reconstruction after disasters.

Agence France-Presse/Getty Images



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# Fragmentation

- Housing Unit
- Zoning
- Local Enforcement (with exception of federally subsidized housing)
- Covenants
- Segregation by race and income



# Neighborhood and Income



# Is Housing a Shared Commons?

## What is The Commons?

“The commons is everywhere. It is the air we breathe, the words we speak, the traditions we respect. It is tangible and intangible, ancient and modern, local and global. It is everything we inherit together, as part of a community, as distinct from things we inherit individually. It is everything that is not privately or state-owned. ...”



# Cuyahoga River ca. 1960



# The New York Times

Published: July 27, 1918

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## PLEA FOR FRESH AIR FUND.

### Association for Improving Condition of Poor Makes Appeal.

The New York Association for Improving the Condition of the Poor is cooperating with the Children's Federal Bureau in its nation-wide effort to save and conserve the lives and health of America's children. One method of doing this during the hot Summer months is to get the mothers and children of the tenements away from their stifling, crowded quarters out to the ocean front



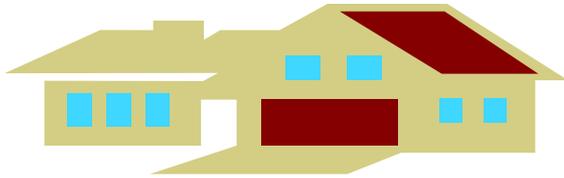
# Harmonizing Actions

- Clean Water Act
  - Clean Air Act
  - Hazardous Waste on Private Land (Superfund)
  - Toxics (TSCA and REACH)
  - Workplace Safety and Health
  - Child Labor
  - World Trade
  - Kyoto Protocol
- 
- Where Is the Harmonization on Healthy Housing?



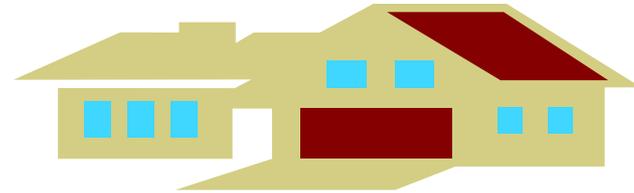
## House

Physical Structure  
Design Characteristics



## Home

Social and Psychological  
Characteristics



## Neighborhood

Physical Area Around House  
Local Services, e.g. health care  
Social Characteristics

Canadian Population Health Initiative



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# The International (i.e. US) Code Council and the World Series



ICC

INTERNATIONAL  
CODE COUNCIL®

People Helping People Build a Safer World™

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# An International Healthy Housing Code?

**Existing ICC codes, but ICC rejection of provisions for lead, radon, mold, asbestos and other health issues**

- *International Building Code®*
- *International Energy Conservation Code®*
- *International Code Council Electrical Code Administrative Provisions ®*
- *International Existing Building Code®*
- *International Fire Code®*
- *International Fuel Gas Code®*
- *International Mechanical Code®*
- *ICC Performance Code™*
- *International Plumbing Code®*
- *International Private Sewage Disposal Code®*
- *International Property Maintenance Code®*
- *International Residential Code®*
- *International Urban-Wildland Interface Code™*
- *International Zoning Code®*



# Affordable Housing Crisis & the Intersection with Health

- Households spending more than half their income on housing increased 14% -- to nearly 16 million from 2001-2004
- Families in the bottom 25% expenditure bracket that spend more than half on housing have only \$400/month left for food, clothing, medical care, etc
- The supply of affordable rental housing fell by 13% between 1993-2003
- 2.5-3.5 million people are homeless at some point in a given year
- Nearly 2 million households live in severely inadequate housing units.

Joint Center for Housing Studies, Harvard University, The State of the Nation's Housing, 2004 and 2006



# Cities & Economic Development

- Population grew from 151 million in 1950 to 300 million in 2006, with another 120 million in next 43 years
- The myth of de-urbanization & information economy--density
- Top 100 metro areas have 12% of land, but 65% of population, 74% of educated citizens
- Metro areas now more complex than just city/suburb; more poor people now live in suburbs
- Legacy of industrial past (old contaminated housing, aging infrastructure, polluted lands & competition for families and business)
  - Source: Katz, A Blueprint for National Prosperity, Brookings 2007



# Medical Care Costs and Housing Improvement – Harmonization?

## Living conditions and health promotion strategies

**P J Ambrose**

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*Peter J Ambrose, BA, AKC, MA, DPhil, FRSA, Visiting Professor in Housing Studies, Health and Social Policy Research Unit, University of Brighton, Falmer, East Sussex BN1 9PH, England*

*Received 17 August 1999, revised and accepted 19 October 2000*

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Key words

**Exported costs; health gain; health promotion strategies; living conditions; urban regeneration**



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# Housing Price & Health

- Should a Healthy Home Cost More?
- Why are Healthy Homes Investments Unlike Other Home Improvements?
- Finding Market Vehicles to Provide Incentives to Promote Investment in Green Healthy Homes & Communities
- Cost of NOT Making Homes Healthy
- Cost Shifting



# Fragmentation or Harmonization?

- Inspection
- Hazard Assessment
- Intervention & Hazard Elimination



# Fragmentation?

## US Housing Hazard Identification Protocols

- RECS – Residential Energy Consumption Survey
- AHHS – American Healthy Housing Survey
- AHS – American Housing Survey
- PHAS – Public Housing Assessment System
- HQS – Housing Quality Standards
- UPCS – Uniform Physical Condition Standards
- CEHRC – Community Environmental Health Resource Center
- NEAT – National Energy Assessment Tool
- Private Inspection Systems



Available online at [www.sciencedirect.com](http://www.sciencedirect.com)



Environmental Research 102 (2006) 13–21

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**Environmental  
Research**

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[www.elsevier.com/locate/envres](http://www.elsevier.com/locate/envres)



# A qualitative review of housing hazard assessment protocols in the United States<sup>☆</sup>

David E. Jacobs

*National Center for Healthy Housing, Columbia, MD 21044*



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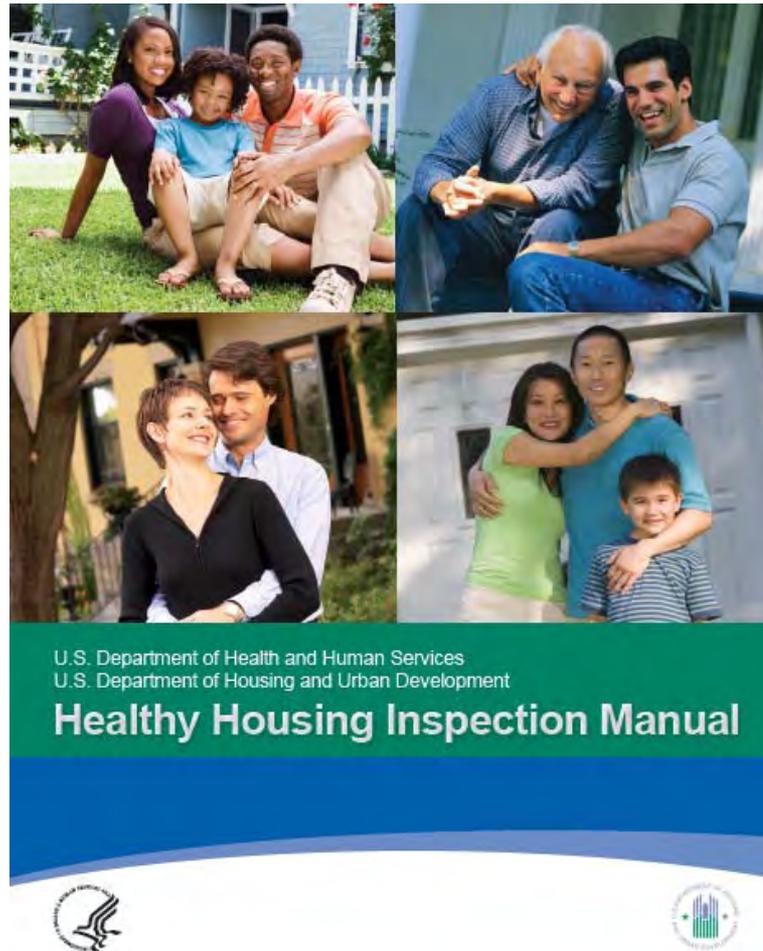
# Visual Assessment (1)

## Electrical Safety

	HARP	AHHS	AHS	PHAS	HQS	CEHRC	NEAT
Exposed Fuse Box Wiring				Y	Y		Y
Broken Plugs/Exposed Wiring	Y		Y	Y	Y		Y
Rooms w/no outlets			Y	Y	Y		
GFCI in wet rooms	Y			Y	Y		
Childproof Plugs	Y	Y					
Overloaded Circuits Burnt Breakers/Fuses	Y	Y		Y	Y		Y
Aluminum Wiring			Y				Y
Low Power Lines	Y						



# Harmonization Trends (1)



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# Harmonization Trends (2)

- English House Condition Survey
- LARES (Large Analysis and Review of European housing and health Status)
- US Healthy Homes Inspection Manual
- Linked Housing and Health Surveys
- World Health Organization



# Harmonization Trends (3) Assembling the Evidence



Report on the WHO technical  
meeting on quantifying  
disease from inadequate  
housing

Bonn, Germany, 28-30 November, 2005



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# Sufficient Evidence (WHO 2005)

- **PHYSICAL FACTORS:**
  - Heat and related temperatures and winter excess mortality
  - Cold indoor temperatures and winter excess mortality
  - Energy efficiency of housing and health
  - Radon exposure in dwellings and cancer
  - Neighborhood and building noise and related health effects
- **SOCIAL FACTORS:**
  - Multifamily housing, high-rise housing, housing quality and mental health
- **CHEMICAL FACTORS:**
  - ETS exposure in dwellings and respiratory and allergic effects
  - Lead-related health effects
- **BIOLOGICAL FACTORS:**
  - Humidity and mold in dwellings and related health effects
  - Hygrothermal conditions and house dust mite exposure



# Some Evidence (WHO, 2005)

- **PHYSICAL FACTORS:**
  - Ventilation in the dwelling and respiratory and allergic effects
- **CHEMICAL FACTORS:**
  - VOCs and respiratory, cardiovascular and allergic effects
- **BIOLOGICAL FACTORS:**
  - Cockroaches and rodents in dwellings and respiratory and allergic effects
  - Cats, dogs and mites in dwellings and respiratory and allergic effects
  - Pets and mites and respiratory, allergic or asthmatic effects
- **BUILDING FACTORS:**
  - Sanitation and hygiene conditions and related physical health effects
- **SOCIAL FACTORS:**
  - Social conditions of housing and fear/fear of crime
  - Poverty and social exclusion and related health effects
  - Crowding and related health effects
  - Social factors/social climate and mental health



# Insufficient Evidence (WHO, 2005)

- Lighting conditions in the dwelling and mental and other health effects
- Particulate matter in indoor air and respiratory and allergic effects



# Fragmentation? Interventions

- LEED
- NAHB
- Code Compliance
- Energy Star/Indoor Air
- Health House
- Green Buildings/Green Communities



# Harmonization: Assembling the Evidence on Intervention Effectiveness



NATIONAL CENTER FOR HEALTHY HOUSING



Healthy Homes Expert Panel Meeting:  
Peer Review of Intervention Studies  
December 11-12, 2007  
Atlanta, Georgia



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# Example Of Interventions Ready for Implementation (Clinical)

- **Multi-faceted tailored interventions for asthma**
  - Education
  - Mattress and pillow covers
  - HEPA Vacuum
  - HEPA Air Filter
  - Smoking Cessation
  - Cockroach Extermination
  - Medical Management Plan



# Example Of Interventions Ready for Implementation (Exposure)

- Cockroach Multi-faceted Interventions for Asthma
  - Integrated pest management
    - Household cleaning and tool dispensing
    - Professional cleaning
    - Resident education
    - Baits
    - Structural repairs



# Example Of Interventions in Need of Formative Research

- Fire Prevention
  - Design of smoke alarms to optimize efficacy, reliability and long-term function
  - Home- and community-based education, distribution programs to reduce ignition sources (e.g., update wiring, clean chimneys, safe space heaters)
  - Exploration of behaviors to escape fires
  - Acceptability, promotion and adverse effects of automatic fire sprinkler systems



# Example of Interventions in Need of Formative Research

- Fall Prevention
  - What specific home modifications are most effective for reducing older adult falls?
- Drowning
  - Are pool covers or alarms effective alternatives to pool fencing?
  - Do pool covers or alarms add benefit to pool fencing?
  - Better designs for bathtubs?



# Ex. Interventions Shown to be Ineffective

- **Older Adult Falls** - Advice/recommendations alone for home modification
- **Fires**
  - Smoke alarm give away programs
  - Home safety education to store matches or lighters out of reach for children
- **Drowning**
  - 3-sided pool fencing less effective than 4-sided fencing and may be harmful



# Green Communities Minnesota Case Study (Presented In Detail Elsewhere)



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# Green Communities Criteria

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1. Location and Neighborhood Fabric
2. Integrated Design Process
3. Site
4. Water Conservation
5. Energy Conservation
6. Materials and Resources
7. Healthy Living Environment
8. Operations and Management



# Minnesota Partners

## Viking Terrace Apartments

Worthington, Minnesota



- Southwest Minnesota Housing Partnership
- Minnesota Green Communities
- Greater Minnesota Housing Fund
- Center for Sustainable Building Research
- Enterprise Community Partners
- National Center for Healthy Housing



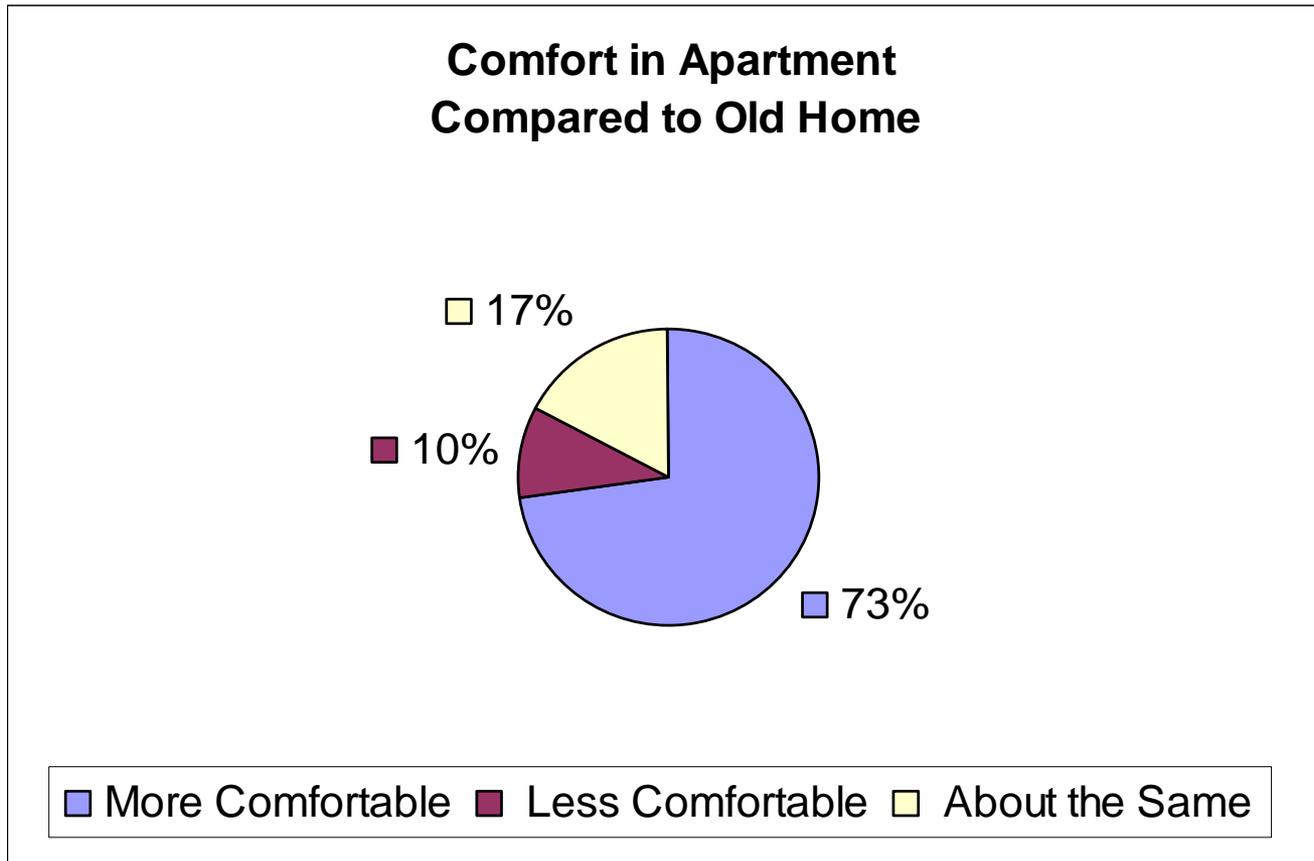
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# Green Rehab Elements at Viking Terrace

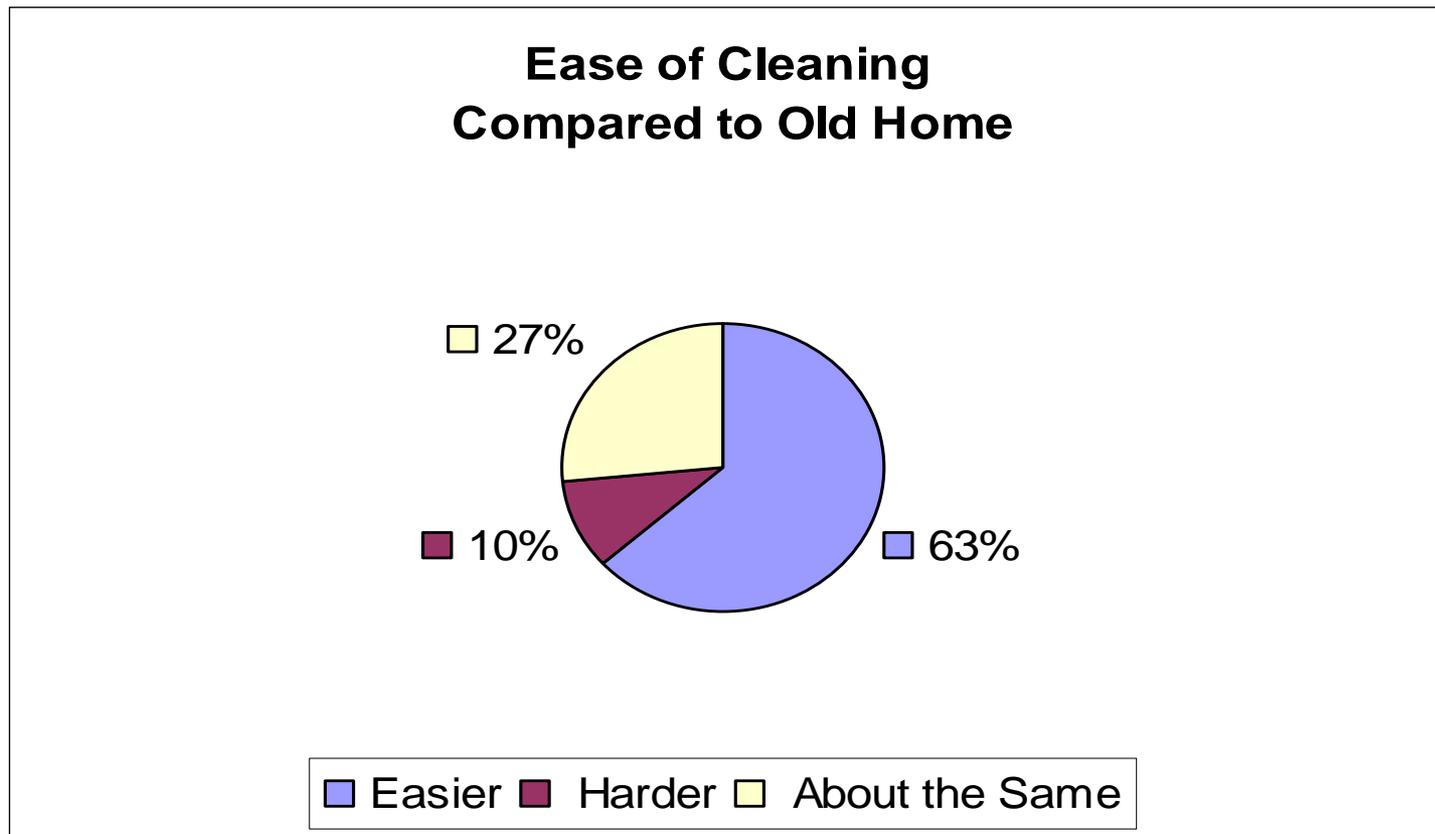
- Ventilation: ASHRAE 62.2
- Low-VOC adhesives, paints & coatings.
- Radon testing in units before rehabilitation & post-construction.
- Pest management: Contracted with a pest management firm specializing in integrated pest management.
- Non-smoking common areas.
- No carpets in wet areas (kitchens, baths, laundry).
- Energy Star-labeled bathroom fans that exhaust to the outdoors and are equipped with a humidistat sensor or timer.
- Surface drainage of water away from windows, walls, and foundations. French drains installed around the perimeter of all buildings.



# Baseline Questionnaire Results

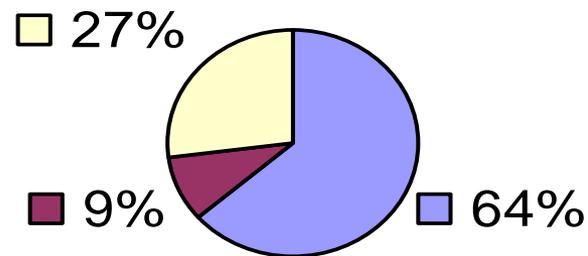


# Baseline Questionnaire Results-2



# Baseline Questionnaire Results-3

## Amount of Time Children in Household Play Outside Compared to Old Home

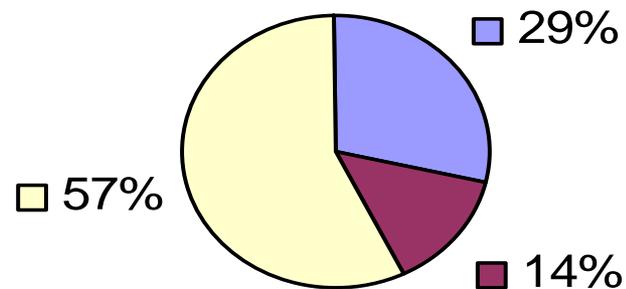


■ Play Outside More ■ Play Outside Less ■ About the Same



# Baseline Questionnaire Results-4

## Child's Health Compared to When In Old Home

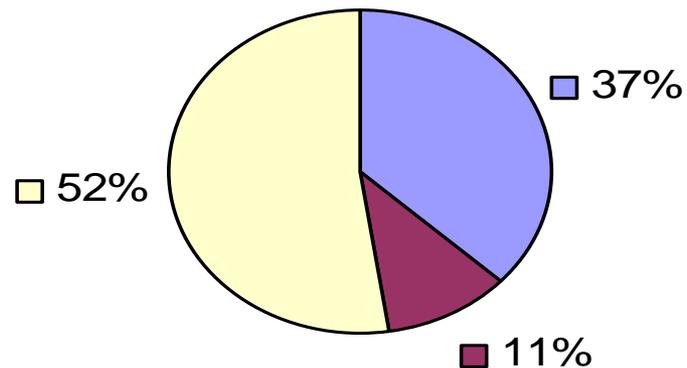


■ Better Now ■ Worse Now ■ About the Same



# Baseline Questionnaire Results-5

## Adult's Health Compared to When in Old Home

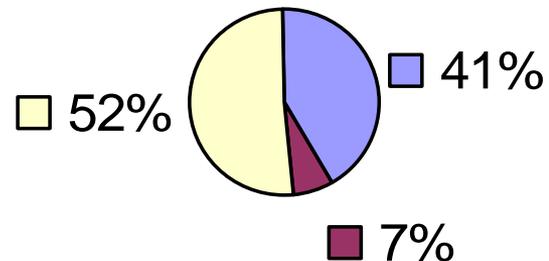


■ Better Now ■ Worse Now ■ About the Same



# Baseline Questionnaire Results-6

## Safety of Building Compared to Old Home



■ Safer ■ Less Safe ■ About the Same



# Ventilation Testing

Ventilation System	Before Renovation	After Renovation	Comparison to Design Standard
Fresh Air Supply	None (bldg leakage only)	21-27 cfm	70% (ASHRAE 62.2)
Kitchen Exhaust	Yes (low flow rate unknown)	80 cfm (160 cfm fans specified)	100 cfm (ASHRAE 62.2)
Bath Exhaust	Yes (low flow rate unknown)	66 cfm (80 cfm fans specified)	50 cfm (ASHRAE 62.2)
Building Envelop Leakage	Very High (Drafty Conditions)	0.38 cfm/ft <sup>2</sup> @ 50 Pa	0.24 cfm/ft <sup>2</sup> @ 50 Pa (MN SF)
Duct Leakage	Very High	71% @ 25 Pa	6 cfm/100ft <sup>2</sup>
Duct Return Air Flow	Very Low	345 cfm	Within ± 10% of mfg spec

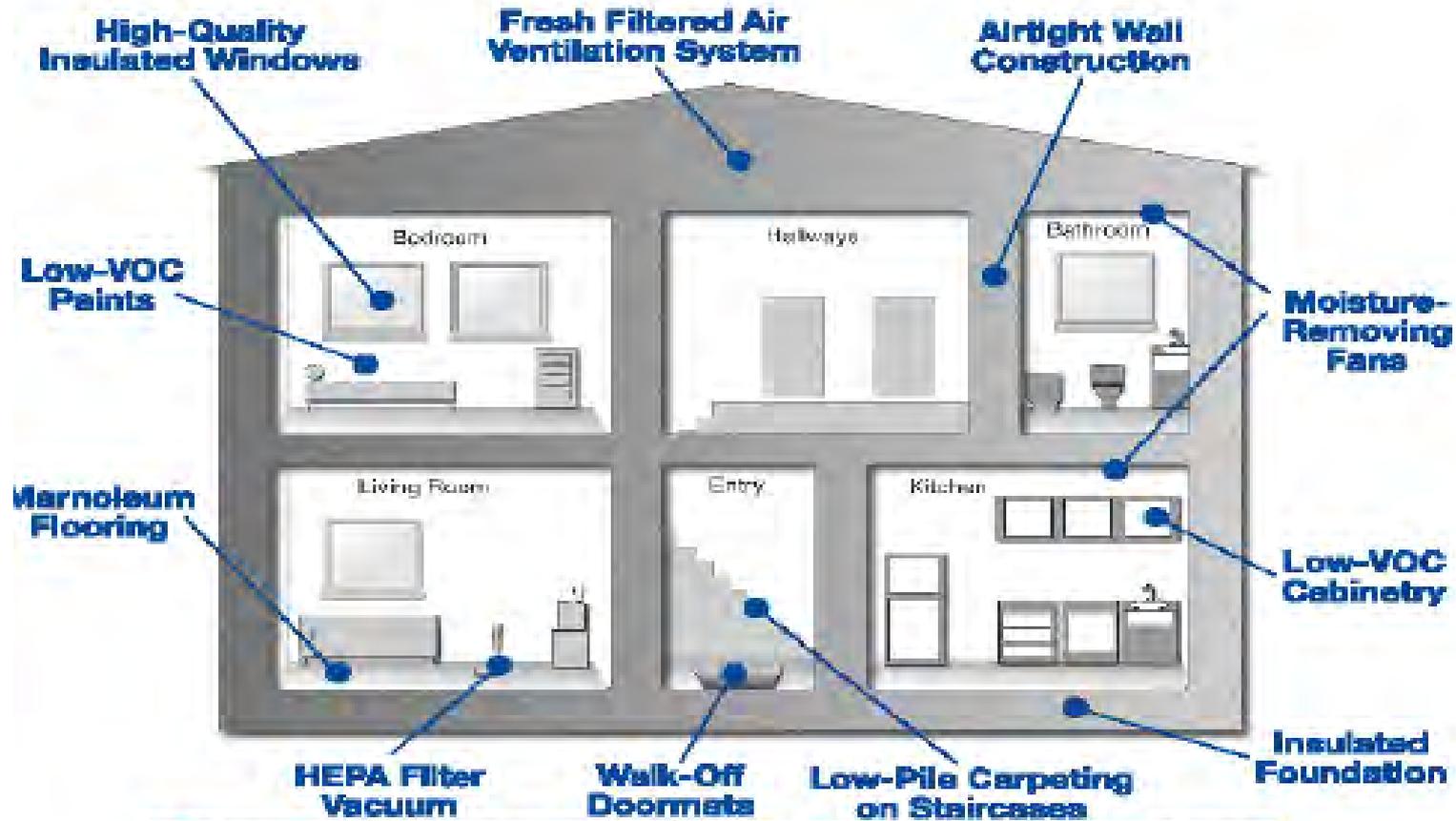


# Summary of MN Results

- There were noticeable improvements in child and adult health, comfort, safety and ease of cleaning.
- Radon testing showed the need for mitigation
  - **now underway**
- Ventilation measurements show fresh air supply, duct sealing and need for improved exhaust ventilation in kitchens and bathrooms
  - **now underway**



# High Point Breathe Easy Homes



**HIGH POINT BREATHE EASY HOMES**



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## Breath Easy Home Study – Preliminary Results (1)

Endpoints	Old Home				New Home	home Δ	
	Base n=22	Exit1* n=22	Δ	p		Δ	p
Symptom-free days/2 wks	7.0	7.1	0.1	.964	12.4	4.8	.004
Caretakers quality of life	4.9	5.0	0.1	.810	5.8	0.8	.002
Urgent clinical care (%)	60.0	60.0	0	1.00	20.6	-41.2	.002
Asthma trigger exposure <sup>†</sup>	2.0	1.4	-0.6	.016	.03	-1.33	.000

\* upon exit1 (old home) 35 families were enrolled, only 22 had old home baseline

<sup>†</sup> presence of rodent, roach, pet, mould or moisture



# Conclusions from Green Healthy Homes Studies

- Low-income housing can be renovated using Green and Health Homes principles that promote energy conservation, sustainability and public health and safety.
- Ventilation and environmental testing can help to ensure that building renovation design performs as intended.
- Collaboration of housing, health and environmental professionals is essential.

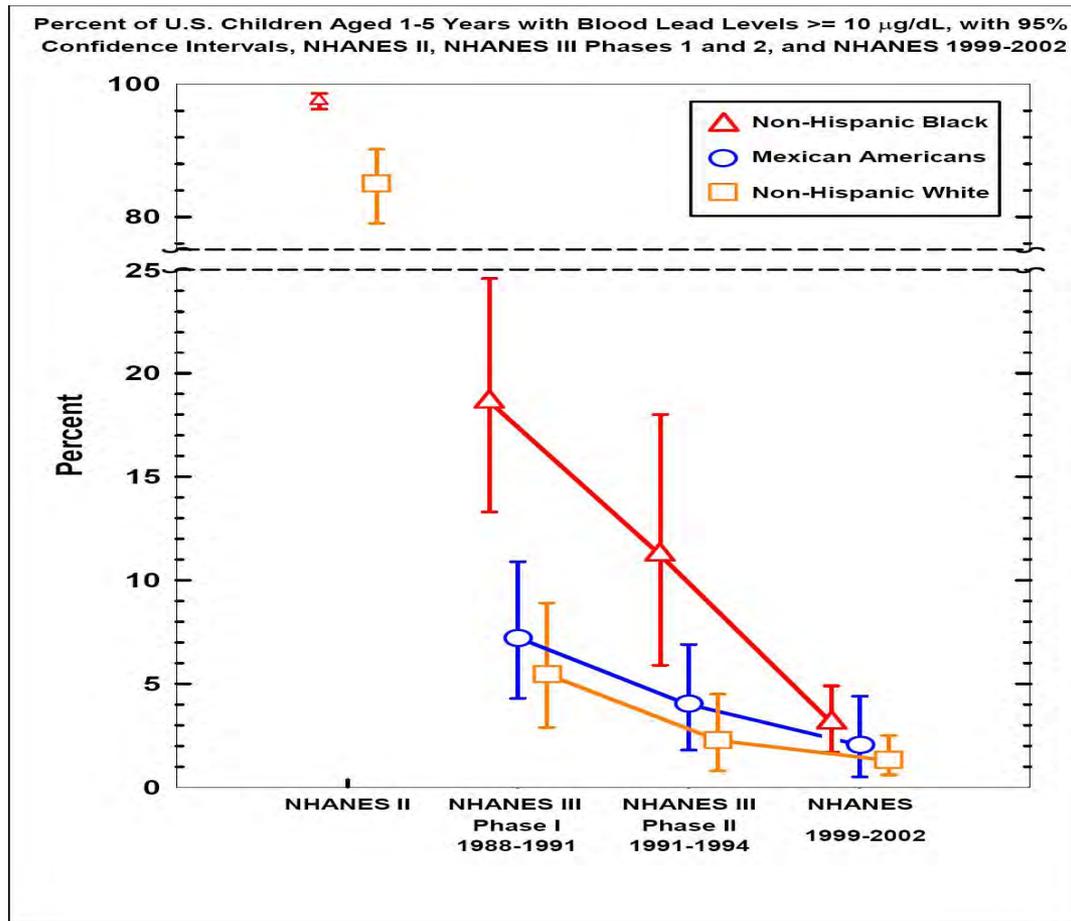


# Harmonization

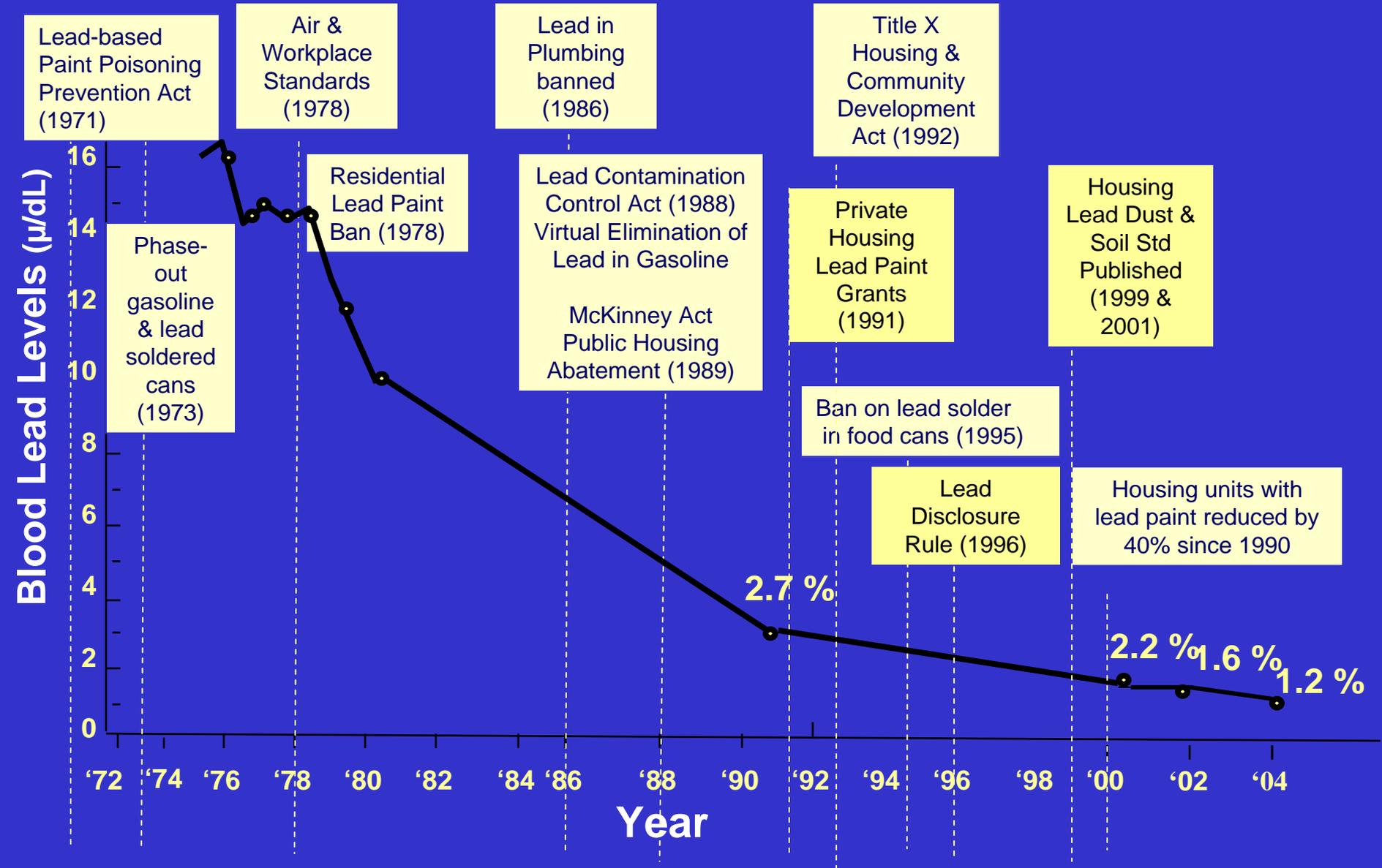
- Assessment of Housing Inspection Systems
- Assessment of Housing Interventions
- Harmonize findings to create an evidence-based healthy housing standard
- Protecting privacy, ensuring liberty and enhancing the shared commons
- How does the lead experience inform harmonized Healthy Homes efforts?



# Blood Lead U. S. Children 1975-2002



# US Policies & Blood Lead 1971-2004



# Lead Paint Barriers Before the 1990s: Implications for Healthy Homes Today (1)

- No health-based exposure standards for paint, dust or soil
- No standard inspection or abatement protocols
- No prohibited paint removal methods
- No lab QA/QC
- No performance criteria for paint XRFs



# Lead Paint Barriers Before the 1990s: Implications for Healthy Homes Today (2)

- No trained or licensed inspectorate or abatement work force
- No occupational standards to protect construction workers
- No training curricula
- No concerted public education
- No laws regarding disclosure of known lead paint hazards & no enforcement
- No funding to address hazards in low-income privately owned high risk housing



# Key Policy & Research Needs to Market Healthy Homes

- Standardizing housing hazard measurement techniques & interventions
- Interactions between specific housing conditions and physical and mental health
- Long-term large longitudinal studies of the efficacy of integrated housing- and community-based interventions
- Workforce development
- Cost Benefit, Legislation, National Plan, Appropriations



# A National Conversation

- High Costs of Health Care/Health Insurance
- Mortgage Crisis & Affordable Housing
- Economic Development & Housing As Infrastructure (Shared Commons)
- Healthy Homes, Green Development, Climate Change
- Healthy Homes Must Join the Conversation  
An Unprecedented Convergence!!



# **Declaration of the Fourth Ministerial Conference on Environment and Health, Budapest, Hungary, June 23-25, 2004**

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We are therefore committed, within the limits of our national mandates, to taking action to ensure that health and environmental dimensions are placed at the core of all housing policies.

**Signed by U.S. & Many Other Countries**



# Substandard Housing And Community Disinvestment Is:

- Not Sustainable
- Not Affordable
- Not Healthy



# Contact Information

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## **Recent Developments in Housing Standards and Assessments in England**

**David Ormandy**  
**University of Warwick, England**

# Historical Perspective

- 1919 – Ministry of Health suggested a Standard of Fitness for Human Habitation
- 1946 – Central Housing Advisory Committee suggested Standard of Fitness
- 1954 – Standard of Fitness incorporated in national legislation
- 1969 – Minor (very) revisions
- 1990 – Revised Fitness Standard introduced
- 2006 – Major change to content and approach



# 1990 Fitness Standard

For a dwelling-house to be fit it must -

- (a) be structurally stable;
- (b) be free from disrepair;
- (c) be free from dampness;
- (d) have adequate provision for lighting, heating and ventilation;
- (e) have an adequate piped supply of water;
- (f) have satisfactory facilities for the preparation and cooking of food, including a sink with hot and cold water supplies;
- (g) have a suitably located water closet for the exclusive use of the occupants;
- (h) have, for the exclusive use of the occupants, a suitably located fixed bath or shower and wash hand basin, each with a supply of hot and cold water;
- (i) have an effective system for the draining of foul, waste and surface water.



# From Research into Policy

- Monitoring the New Housing Fitness Standard (1993)
  - reported on call for *arrangement, thermal efficiency, noise, fire, radon, and environment* to be added into Standard
  - identified legislative anomalies
- Building regulation and health and Building regulation and safety (1995)
  - reported that main health and safety hazards in housing not included in Standard
  - used risk assessment to rank hazards



# From Research into Policy

- Controlling Standards in Existing Housing (1998)
  - Identified gaps, overlaps, and contradictions
  - Offered two options - Minor revision or Major change
  - As example of Major Change, suggested an assessment system that graded the severity of risk
- Government consulted on its preferred option - Major Change
  - 98% of respondents supported Major Change



# From Research into Policy

- Government commissioned development of HHSRS (1998)
- HHSRS (v1) released (2000)
  - Development had included -
    - extensive literature review
    - field trials of assessment methodology
    - software for hand held computers (PDAs)



# From Research into Policy

- Statistical Evidence to support HHSRS reviewed and updated (2003)
  - Literature reviewed and updated
  - Data on housing conditions matched with health data
- HHSRS (v2) released (2004)
  - Release coincided with passage of Housing Bill through Parliament
- Part 1 of Housing Act 2004 brought into force (2006)
  - HHSRS became statutory Method for assessing housing conditions



# Principle behind HHSRS

A dwelling, including the structure, associated outbuildings, garden, yard and/or other amenity space, and means of access should provide a safe and healthy environment for the occupants and any visitors.



# Aims and Assumptions

- Be evidence based
- Be hazard based -  
ie, the effect, not the defect
- Rate the seriousness of the hazard
- Be practical in its application



# Potential Housing Hazards

## *A. Physiological Requirements*

Damp and mould growth etc  
Excessive cold  
Excessive heat  
Asbestos (and MMF)  
Biocides  
CO & Fuel combustion products  
Lead  
Radiation  
Uncombusted fuel gas  
VOCs

## *B. Psychological Requirements*

Crowding and Space  
Entry by intruders  
Lighting  
Noise

## *C. Protection Against Infection*

Domestic hygiene, Pests & Refuse  
Food Safety  
Personal Hygiene Sanitation & Drainage  
Water supply

## *D. Protection Against Accidents*

Falls associated with baths etc  
Falls on the level  
Falls associated with stairs and steps  
Falls between levels (e.g from windows),  
Electrical Hazards  
Fire  
Hot surfaces and materials  
Collision and entrapment  
Explosions  
Poor ergonomics  
Structural collapse and falling elements



# Comparing Hazards

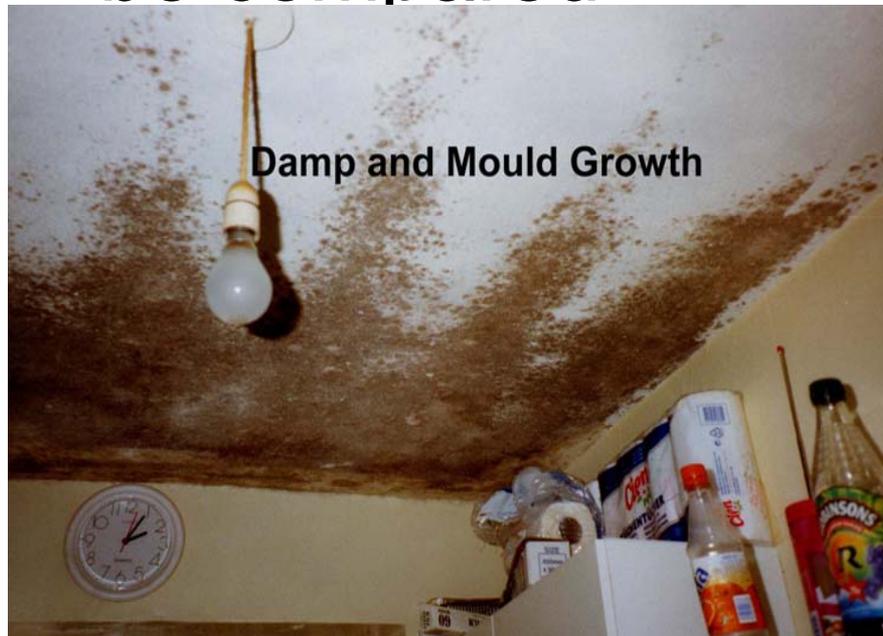
Housing Hazards differ widely -

- Slow and insidious (damp; cold)
- Quick (falls)
- Death very likely (radon, asbestos)
- Death very unlikely (noise)



# Comparing Hazards

A numerical score allows widely differing hazards to be compared



# To reach a Score

HHSRS uses a formula to generate a numerical Hazard Score

Three sets of figures needed -

- Likelihood of an occurrence
- Spread of possible outcomes
- Weightings for severity of outcomes



# Assessment Procedure

- Full dwelling inspection
- Deficiencies related to Hazards
- Surveyor judges whether any Hazard is significant worse than national average
- For those worse than average, surveyor makes an assessment



# HHSRS Averages

## Falling on stairs etc

Average Likelihood and Health Outcomes for all Persons aged 60 years or over, 1997-1999

Dwelling type & age		Average likelihood 1 in	Spread of health outcomes				Average HHSRS scores
			Class I %	Class II %	Class III %	Class IV %	
<b>Houses</b>	Pre 1920	218	2.2	7.7	22.1	68.0	169 (F)
	1920-45	226	2.1	7.4	20.5	70.1	155 (F)
	1946-79	256	1.6	6.6	21.6	70.3	115 (F)
	Post 1979	256	1.4	6.3	25.3	67.1	111 (F)
<b>Flats</b>	Pre 1920	214	3.9	8.0	19.3	68.8	249 (E)
	1920-45	263	1.6	2.8	20.1	75.5	96 (G)
	1946-79	410	2.8	5.3	17.7	74.2	97 (G)
	Post 1979	409	2.6	5.2	19.4	72.8	93 (G)
<b>All</b>		<b>245</b>	<b>1.9</b>	<b>6.7</b>	<b>21.7</b>	<b>69.7</b>	<b>134 (F)</b>



# Assessment Procedure

1. Likelihood of an occurrence over next 12 months which exposes a member of the vulnerable age group to a Hazard

Expressed as a ratio - eg, 1 in 180, 1 in 32, or 1 in 1,000



# Assessment Procedure

## 2. Spread of possible harm outcomes.

For example, while death is judged unlikely from a fall, there may be a 10% chance of serious fractures, a 31.6% chance of severe concussion, and a 58.4% chance of severe bruising.



# Relating People to Hazards

Potential Hazards are assessed in relation to -

A member of the age group most vulnerable to that Hazard and who might typically occupy or visit the dwelling



# Harm

The possible health outcomes, whether temporary or permanent.

That is, the adverse physical or mental effect on the health of a person, such as physical injury, illness, or other health condition or symptom



# Spread of Harms

The possible outcomes are grouped into four Classes of Harm -

Class I - Extreme

Class II - Severe

Class III - Serious

Class IV - Moderate



# Classes of Harm

## Examples of Class I ~

- Death
- Permanent paralysis below the neck
- Malignant lung cancer
- Regular and severe pneumonia
- Permanent loss of consciousness
- 80% or more burn injuries

## Examples of Class II ~

- Asthma
- Non-malignant respiratory diseases
- Lead poisoning
- Legionnaires disease
- Mild stroke
- Chronic confusion
- Loss of a hand or foot
- Serious fractures
- Loss of consciousness for days



# Classes of Harm

## Examples of Class III ~

- Rhinitis
- Hypertension
- Sleep disturbance
- Gastro-enteritis
- Chronic severe stress
- Loss of a finger
- Serious puncture wounds
- Regular and severe migraine

## Examples of Class IV ~

- Occasional severe discomfort
- Broken finger
- Slight concussion
- Moderate cuts to face or body
- Mental stress
- Severe bruising to body
- Regular serious coughs or colds



# Class of Harm Weightings

Weighting given to each Class of Harm to reflect the degree of incapacity

<b>Class of Harm</b>	<b>Weighting</b>
I Extreme	10,000
II Severe	1,000
III Serious	300
IV Moderate	10



# HHSRS Formula

Class of Harm & Weighting			Likelihood		Spread of Harms (%)		Product
I	10,000	÷	L	X	O <sub>1</sub>	=	P <sub>1</sub>
II	1,000	÷	L	X	O <sub>2</sub>	=	P <sub>2</sub>
III	300	÷	L	X	O <sub>3</sub>	=	P <sub>3</sub>
IV	10	÷	L	X	O <sub>4</sub>	=	P <sub>4</sub>
<b>Hazard Score</b>						<b>= P<sub>1</sub> + P<sub>2</sub> + P<sub>3</sub> + P<sub>4</sub></b>	



# Example Hazard Rating - 1

Falling from a window of a ground floor room -

- Likelihood 1 in 18
- Spread of Harm Outcomes -
  - Class I - 0% as death very unlikely
  - Class II - 10% chance of serious fractures
  - Class III - 31.6% chance of severe concussion
  - Class IV - 58.4% chance of severe bruising



# Example Hazard Rating - 1

<b>Class of Harm Weightings</b>		<b>Likelihood</b>		<b>Spread</b>		
<b>10,000</b>	<b>÷</b>	<b>18</b>	<b>x</b>	<b>0</b>	<b>=</b>	<b>0</b>
<b>1,000</b>	<b>÷</b>	<b>18</b>	<b>x</b>	<b>10</b>	<b>=</b>	<b>556</b>
<b>300</b>	<b>÷</b>	<b>18</b>	<b>x</b>	<b>31.6</b>	<b>=</b>	<b>527</b>
<b>10</b>	<b>÷</b>	<b>18</b>	<b>x</b>	<b>58.4</b>	<b>=</b>	<b>32</b>
<b>Hazard Score =</b>						<b>1,115</b>



# Example Hazard Rating - 2

Falling from a window of a fifth floor room -

- Likelihood 1 in 180
- Spread of Harm Outcomes -
  - Class I - 46.9% chance of death
  - Class II - 31.6% chance of serious fractures
  - Class III - 21.5% chance of severe concussion
  - Class IV - 0% as severe bruising very unlikely



# Example Hazard Rating - 2

<b>Class of Harm Weightings</b>		<b>Likelihood</b>		<b>Spread</b>		
<b>10,000</b>	<b>÷</b>	<b>180</b>	<b>x</b>	<b>46.9</b>	<b>=</b>	<b>2,606</b>
<b>1,000</b>	<b>÷</b>	<b>180</b>	<b>x</b>	<b>31.6</b>	<b>=</b>	<b>176</b>
<b>300</b>	<b>÷</b>	<b>180</b>	<b>x</b>	<b>21.5</b>	<b>=</b>	<b>36</b>
<b>10</b>	<b>÷</b>	<b>180</b>	<b>x</b>	<b>0</b>	<b>=</b>	<b>0</b>
<b>Hazard Score =</b>						<b>2,817</b>



# Assessments under HHSRS

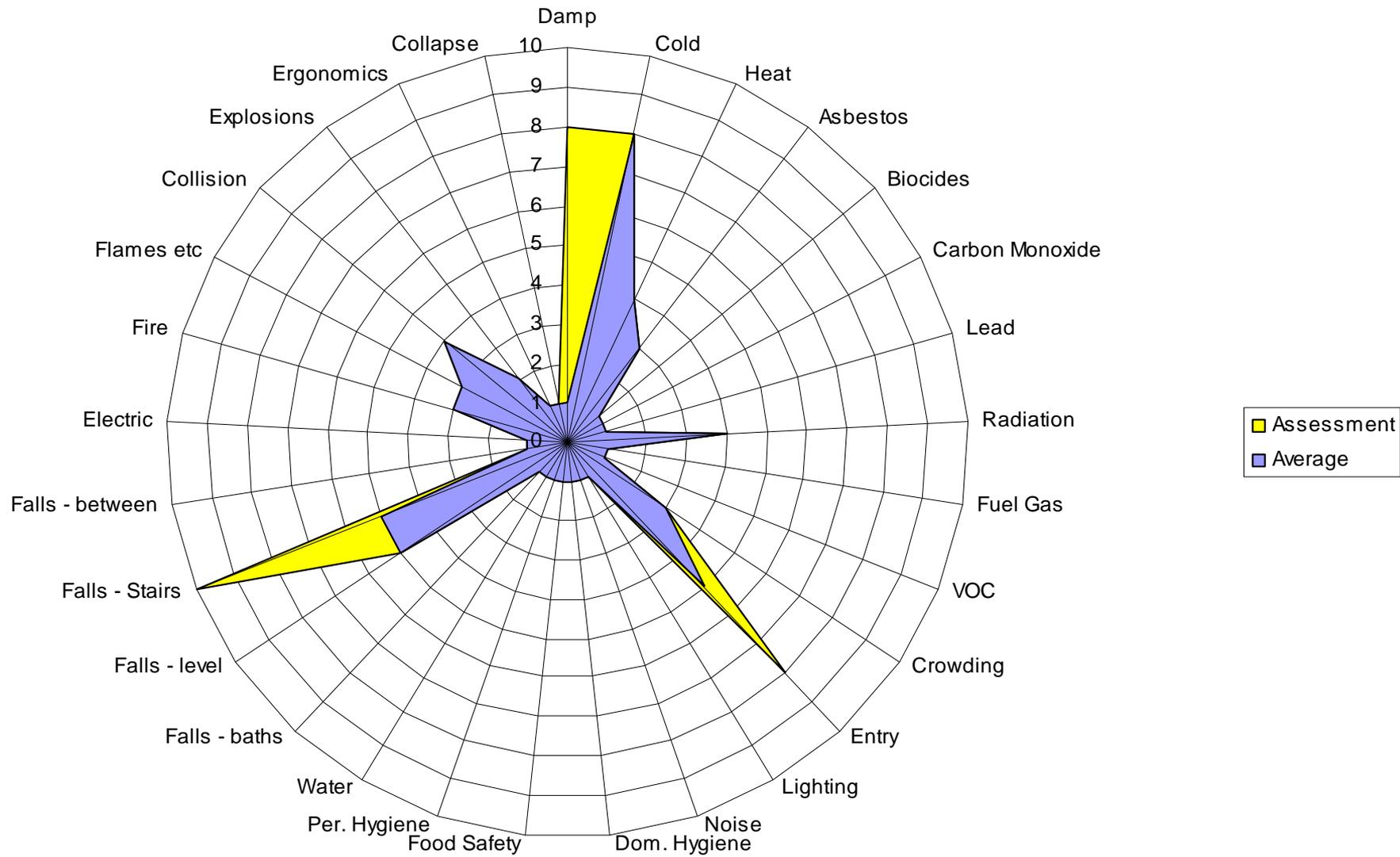
- Only Hazards judged significantly worse than average assessed
- Similar deficiencies in several locations will influence the likelihood
- Secondary hazards may influence the outcomes



# Assessments under HHSRS

- Scores are not aggregated
- Result given in Bands to provide a  
'Hazard Profile'





# From Research into Policy

## Potential Barriers -

- Civil Service - But strong support from one person
- Professionals - Mixed, but vocal opposition -
  - Losing security of Fitness Standard
  - Losing 'mystique' surrounding decisions
  - Lack of information allowed misconceptions



# From Research into Policy

## Potential Barriers -

- Politicians - once civil servants convinced, arrangements made for briefing members of both Houses
- Landlords - presentations at meetings avoided opposition

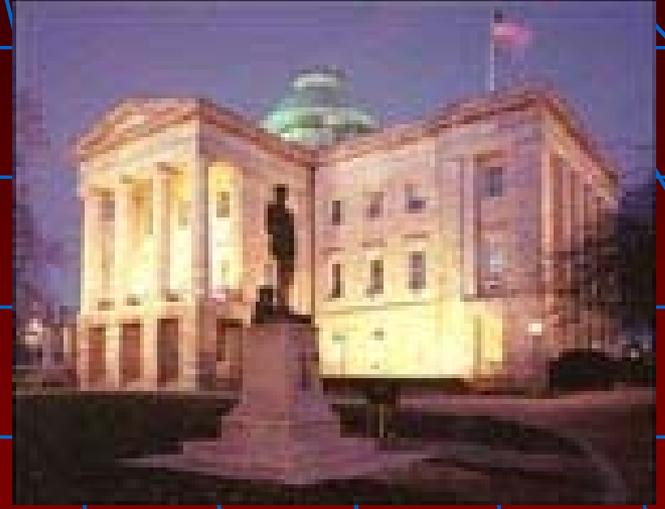


# How did it happen?

“We was lucky.”

Right people in the right place at the right time.





# *Advancing Healthy Housing Agenda through **State Legislatures** (and Policy Makers)*

Building a Framework for Healthy Housing  
Baltimore, MD

**Doug Farquhar, JD**  
National Conference of State Legislatures



# What do they think?

"I grew up in Kellogg, Idaho. I played in the tailings from the lead mines; I ate fish from the streams laced with lead wastes. And look at me – I'm a state senator."

Senator David Peitch, Idaho

"Show me the dead bodies."

Former EPA Region 8 Administrator (and former CO State Senator) David Rayley, upon being presented the reasons for regulating toxic wastes



# Environment and Public Health

***“Improved health owes less to advances in medical science than to changes in the external environment, and to a favorable trend in the standard of living...medicine is in danger of neglecting what has hitherto proved its most powerful resource – the manipulation of the external environment.”***

*Rene Dubos – Winner of the 1969 Pulitzer Prize for general non-fiction.*



# Regulating an unRegulated Community

- Inadequate housing has been linked to adverse human health effects
- Millions of children live in home environments that are unhealthy
- Coordinated, comprehensive, and practical approach to prevent diseases that result from environmental health hazards related to housing



# Regulating an unRegulated Community

- **Private interest; no public component**
  - Eliminates Environmental regulation (via EPA)
- **Not an employee/employer relationship**
  - Eliminates Occupational regulation (via OSHA)
- **Not Rental Housing**
  - Warranty of Habitability
- **No link to Federal Housing Standards**
  - HUD Section 8 Housing - not applicable
  - Indian Housing - not applicable
  - Department of Defense Housing - not applicable



# Healthy Homes Hazards

- Lead hazards
- Asbestos Hazards
- Construction Products
- Indoor air pollutants
  - *chemicals, allergens, smoke, ventilation*
- Pesticides
- Chemical and Safety Hazards
- Rat infestations and other vermin
- Radon
- Other



# Codes that apply to Private Housing

## Housing/Property Maintenance Code

Applied at property transition

## Health/Sanitation Code

## Landlord-Tenant Law

Rental properties

## Product Standards

For consumer products

## Hazard Management Laws

## Miscellaneous

PA Municipal Housing Code Avoidance - sets enforcement penalties but fails to define the municipal housing code



# Various State Codes

## Housing/Property Maintenance Code

CA State Building Standards Code

## Health/Sanitation Code

CO Sanitary Standards and Regulations

## Landlord-Tenant Law

TN Smoke Detector Code

## Product Standards

MN Formaldehyde Product Standard - new and manufactured homes

## Hazard Management Laws

GA Community Living Arrangement Code - mandates a healthy home for residents

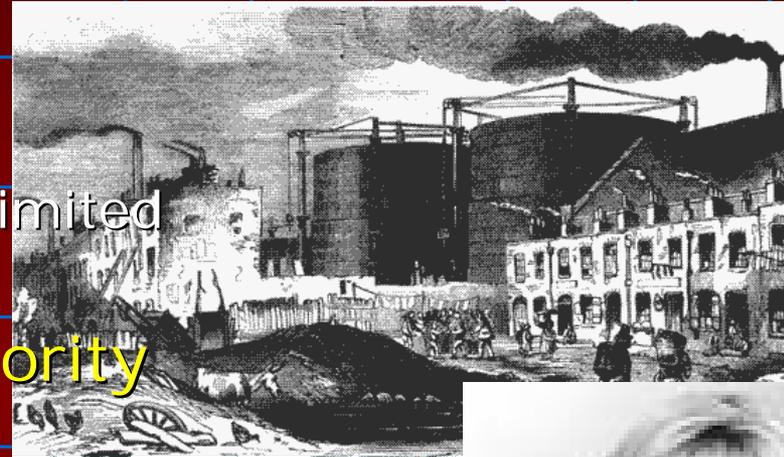
## Miscellaneous

FL Environmental Health - to prevent disease caused by natural and manmade factors in the environment

# How do you get Policy Makers attention??

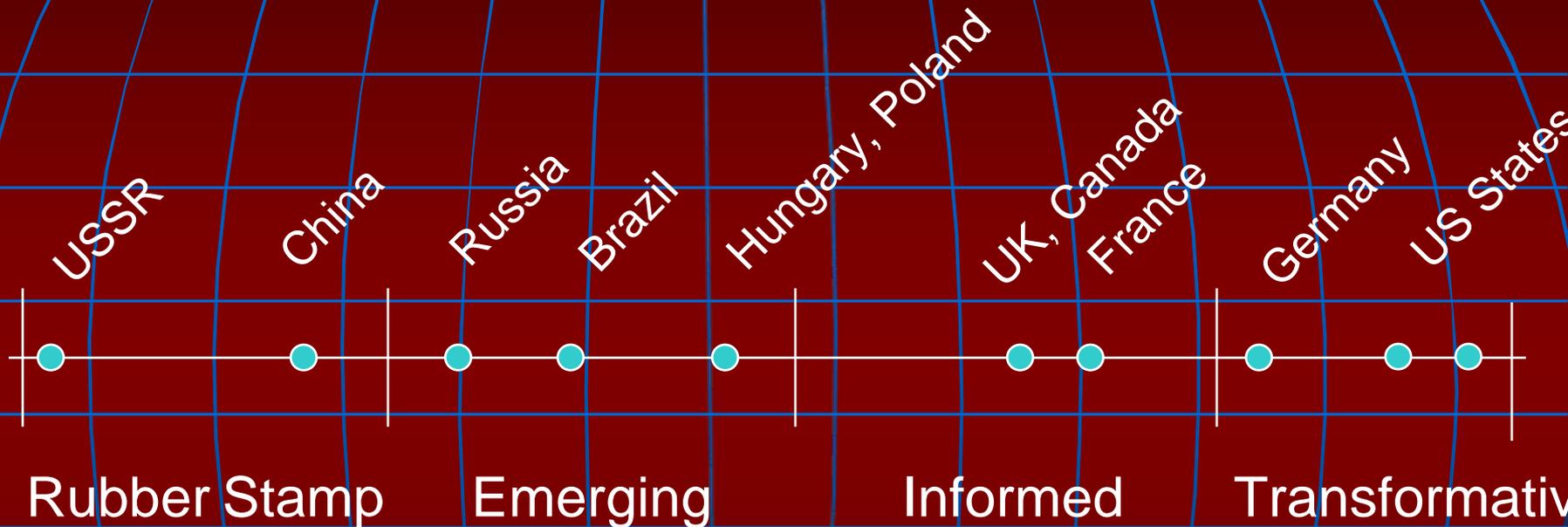


- **Highlight a crises**
  - Perceived or real
  - Doomsday threats have limited appeal
- **Appeal to a higher authority**
  - Moral/Ethical reasons
  - Erin Brockovich
- **Argue better Public Policy**
  - effective response to crises
  - Efficient use of public resources
    - Economic resources
    - Employee resources





# Executive-Legislative Relationships



Information Needs



# No State Alike - Elections

- Every two or four years
  - Alabama elects every state official once every four years
  - LA, MS, NJ and VA have off-year elections
  - Most Senators are elected on four-year cycles
- Only elections at different times are special elections to fill vacancies
- Legislatures never “dissolved” and new elections held



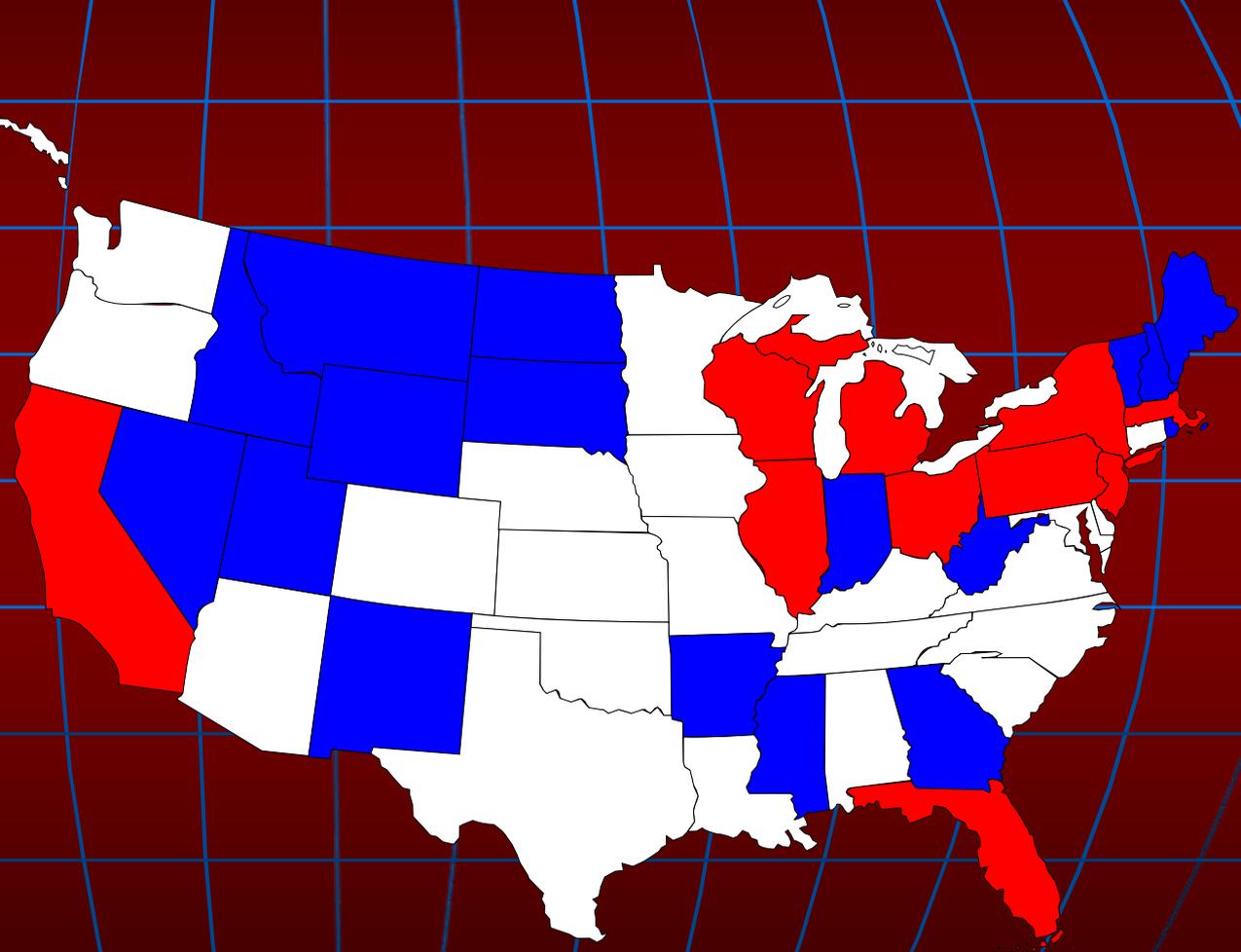
# No State Alike - Legislation

- States with unlimited/limited bill introduction
  - New York introduces close to 10,000
  - CO limits legislators to six
- 27 States allow carryover legislation
- 9 have year round legislatures; FL, NM, UT and WY meet for around 2 mos.
- Legislatures control NC and TX; Executive controls NM and VA



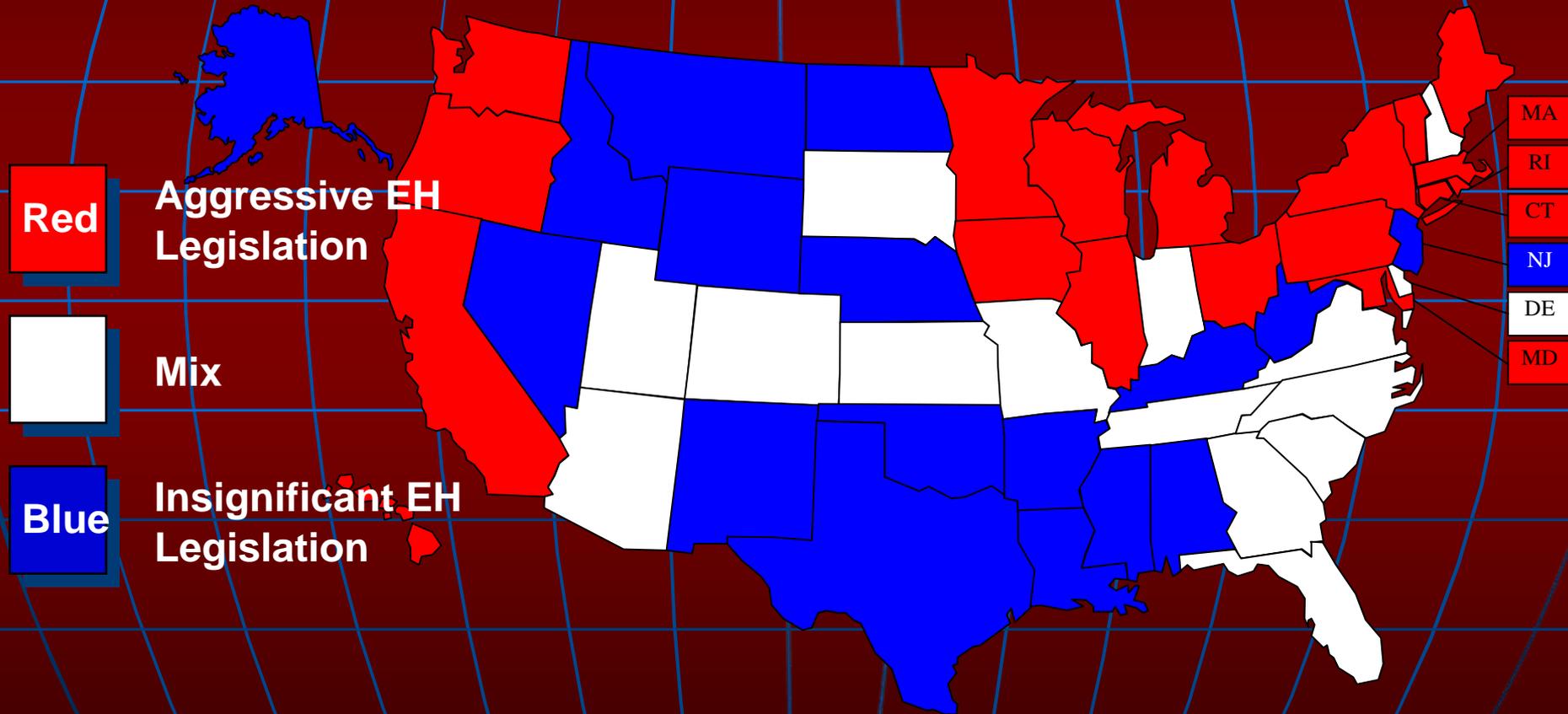
# Types of Legislatures

- Red** Full-time, well paid, large staff
- White** Hybrid
- Blue** Part-time, low pay, small staff





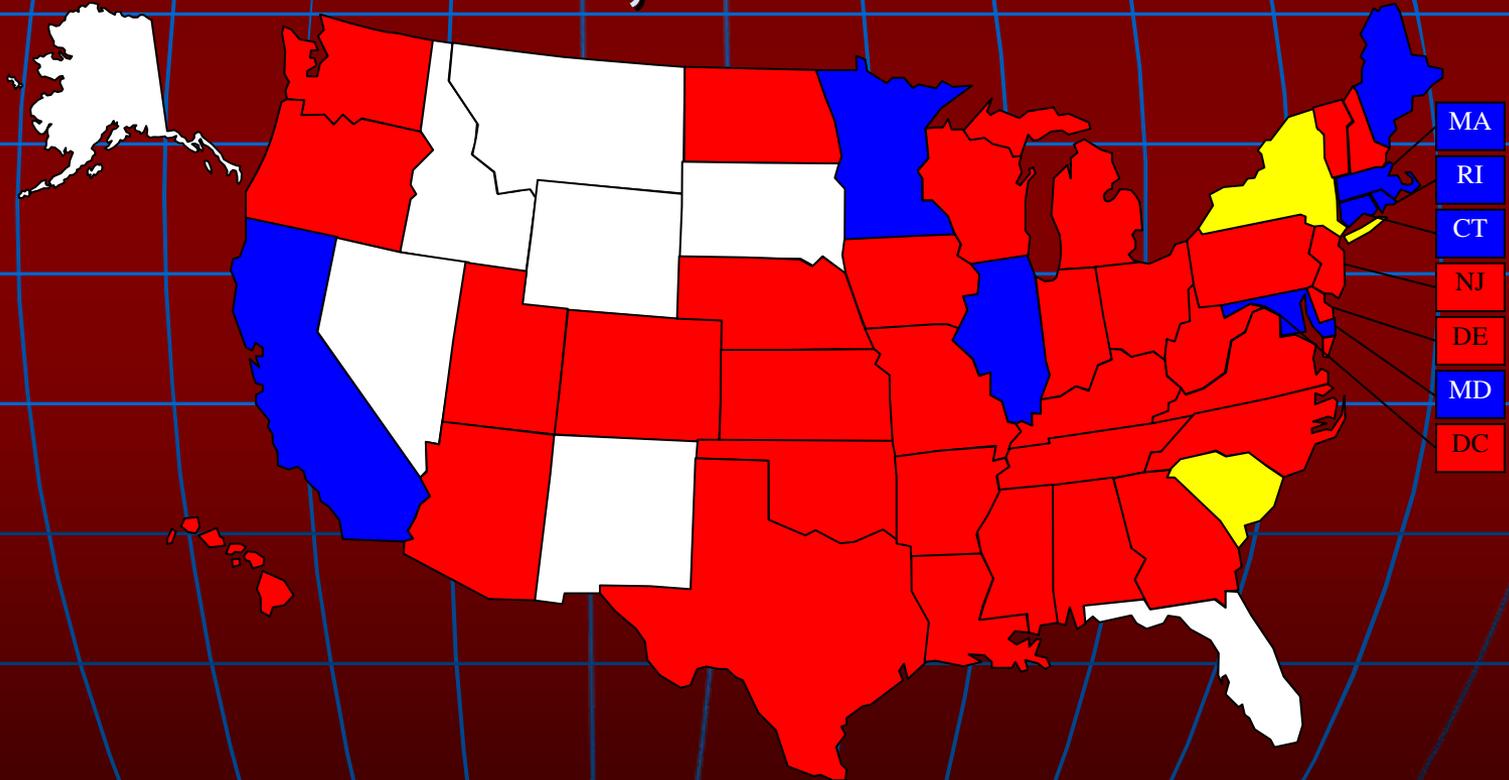
# Environmental Health Legislation 2008





# States adopting TSCA sec. 402

Blue prior 1990; Red after 1990;  
Yellow no TCA; White no law





# TSCA Title 402/404

- EPA targeted State Agencies
  - Agreed to fund programs
  - Linked to HUD funding
  - Did not address Renovation and Remodeling
- State programs must be "at least as protective as" and provide adequate enforcement
- In 18 years, 40 of the 50 states have adopted TSCA Title 402/404



# TSCA Title 402/404

- Comprehensive State Programs
  - Screening
  - Surveillance
  - Outreach
  - Training and Accreditation
  - Supported (at least partially) by State funds
    - Fees and taxes
- Comprehensive program required for effective 402/404 program



# Healthy Homes Legislation

- **No organic Federal Act**
  - No Congressional authority to release grants
- **No model state law**
  - Complex and undefined topic
- **No quick legislative fix**
  - Will require amendments to several laws
  - Will require new authorities for agencies to act
  - Will require additional or reassigned resources



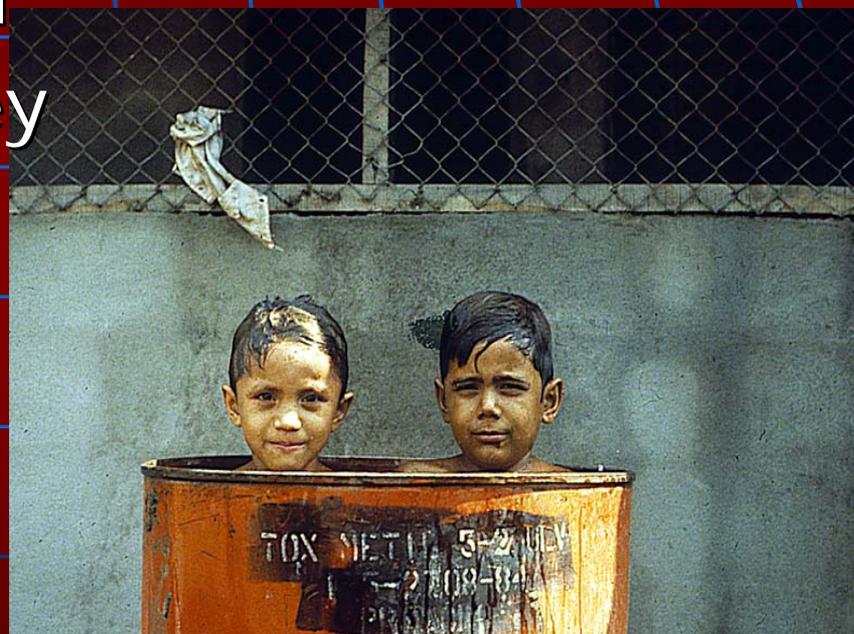
# Healthy Homes Legislation

- **Whose interests are served?**
  - Can public health be linked to Medicaid?
  - Could industry benefit (i.e., profit) from such legislation?
- **Whose interests are compromised?**
  - Who will pay to retrofit homes?
- **Can housing become healthy without legislation?**
  - Amend/expand current legislative authorities
- **Can/will the federal government perform this service?**
  - Will states be preempted from acting?



# Healthy Housing Lawsuits

- Creating a standard of care for legal system
- Providing for Attorney Fees
- Eliminating tort restrictions



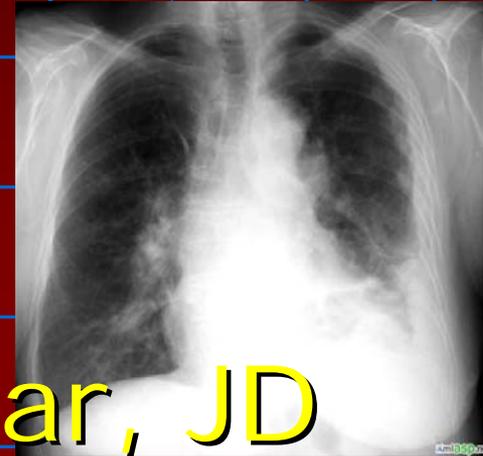
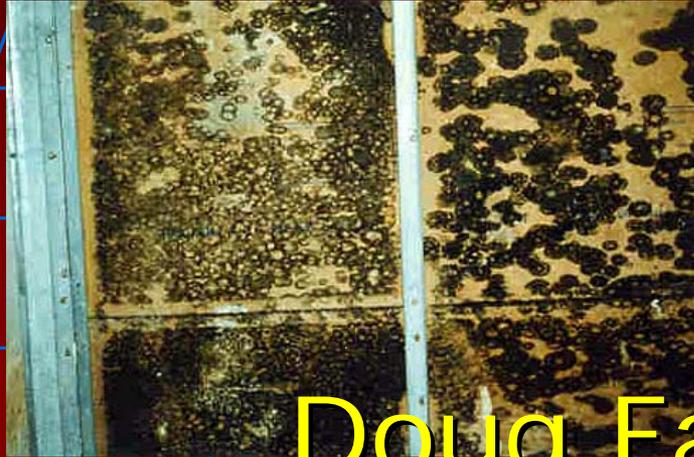


# Can we make a change?

“Anyone who doesn’t believe in miracles is not a realist.”

David Ben-Gurion

# NCSL Environmental Health Program



**Doug Farquhar, JD**

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Legislatures



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