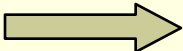

Home Environmental Health Risks of People with Developmental Disabilities

Allison Del Bene Davis PhD, APRN, BC
November 7, 2007

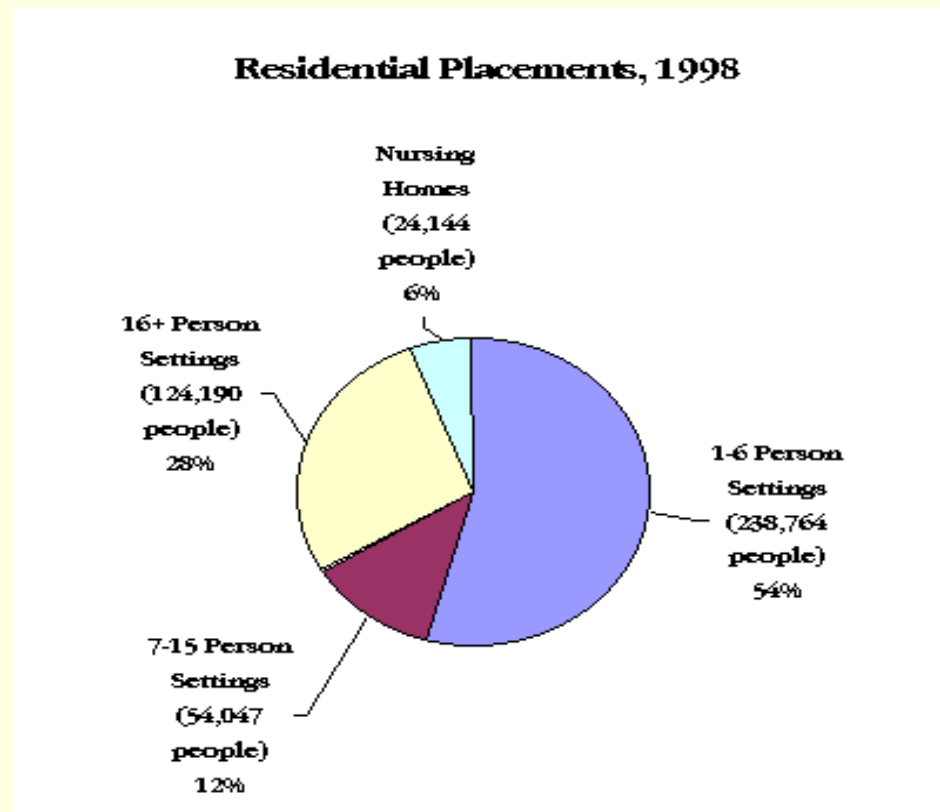
Purpose of the Study

- To explore the home environment and household behaviors and practices that may create environmental health hazards in community-based residential homes for the developmentally disabled.

Study Population

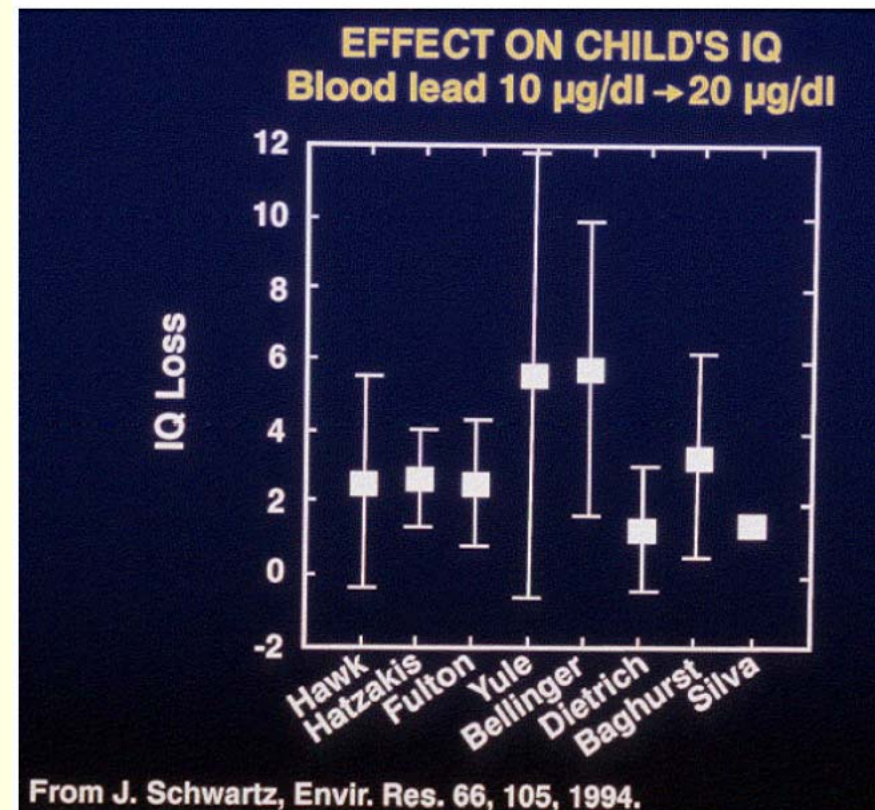
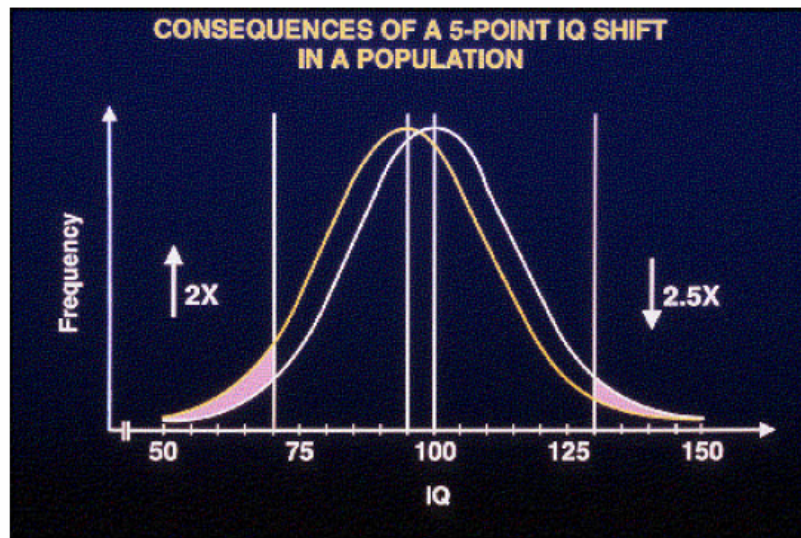
- Developmentally disabled adults who live in community-based residential settings in Anne Arundel County 
- Formally defined by AHRQ in 2003 as a priority population with recognized healthcare disparities.
- Economically disadvantaged
- Higher rates of DD among blacks 24.3 / 1000 versus 13.6 / 1000 for whites.

Community-Based Residential Settings



Source: D. Braddock, R. Hemp, S. Parish, and M.C. Rizzolo, *The State of the States in Developmental Disabilities* (final report), Chicago: University of Illinois at Chicago, Department of Disability and Human Development, (in press).

Neurological Fragility and Neurotoxicant Exposure



Home Environmental Exposures

- It has been estimated that Americans spend over 90% of their time indoors (ALA, 2006, EPA 2006)
- Human exposure to pollutants is influenced by both outdoor and indoor air (Janssen et al, 2005)
- Pollution indoors is created from both outdoor air coming inside and from products and behavioral practices inside the home

Research Questions

- **Q1. How frequent are known home environmental health hazards present in the homes of people with developmental disabilities receiving community-based residential services and living in community-based residential settings?**
- **Q2. How frequently are there protective devices or less hazardous alternatives present in the homes of people with developmental disabilities receiving community-based residential services and living in community-based residential settings?**
- **Q3. How frequently do the practices and behaviors of people with developmental disabilities receiving community-based residential services, provider agencies and staff, create hazardous health conditions, and contribute to poor indoor air quality and pollution in the home environment?**

Study Design and Sampling

- Descriptive design
- Survey and Observational methods
- Sample selection – convenience sample, random selection of participating houses
- Inclusion Criteria
- Home as unit of analysis

Specific Variables

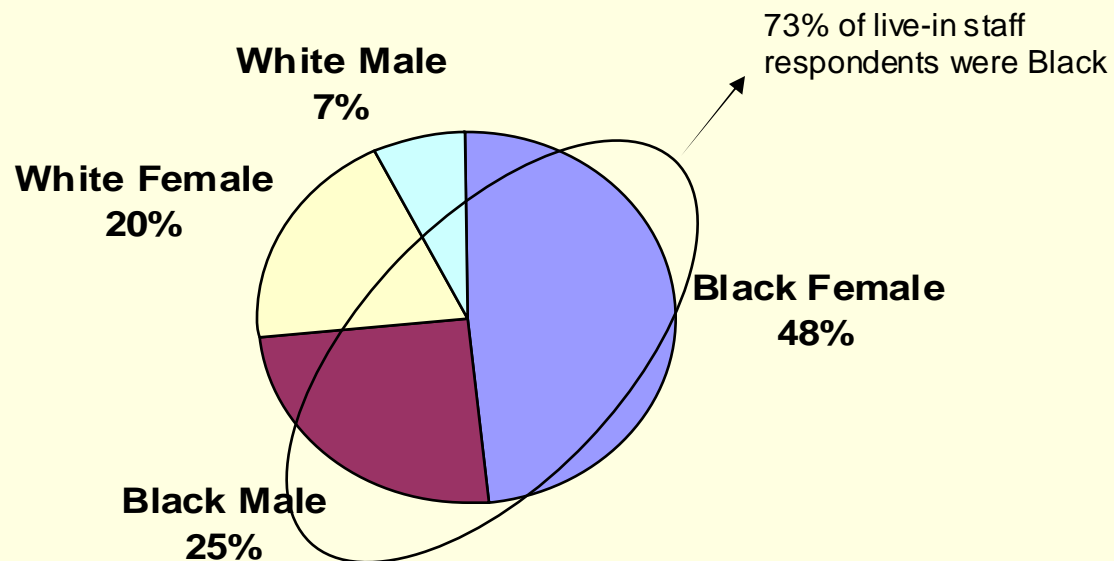
- Lead → Home age, windows, pipes
- Mercury → Metallic, fish consumption
- Carbon Monoxide → Potential exposure, protective devices
- Radon → Abatement, testing
- Pesticides/ Household Products → Use patterns, routine contracts, specific products
- Environmental Tobacco Smoke → Use inside home

Data Collection

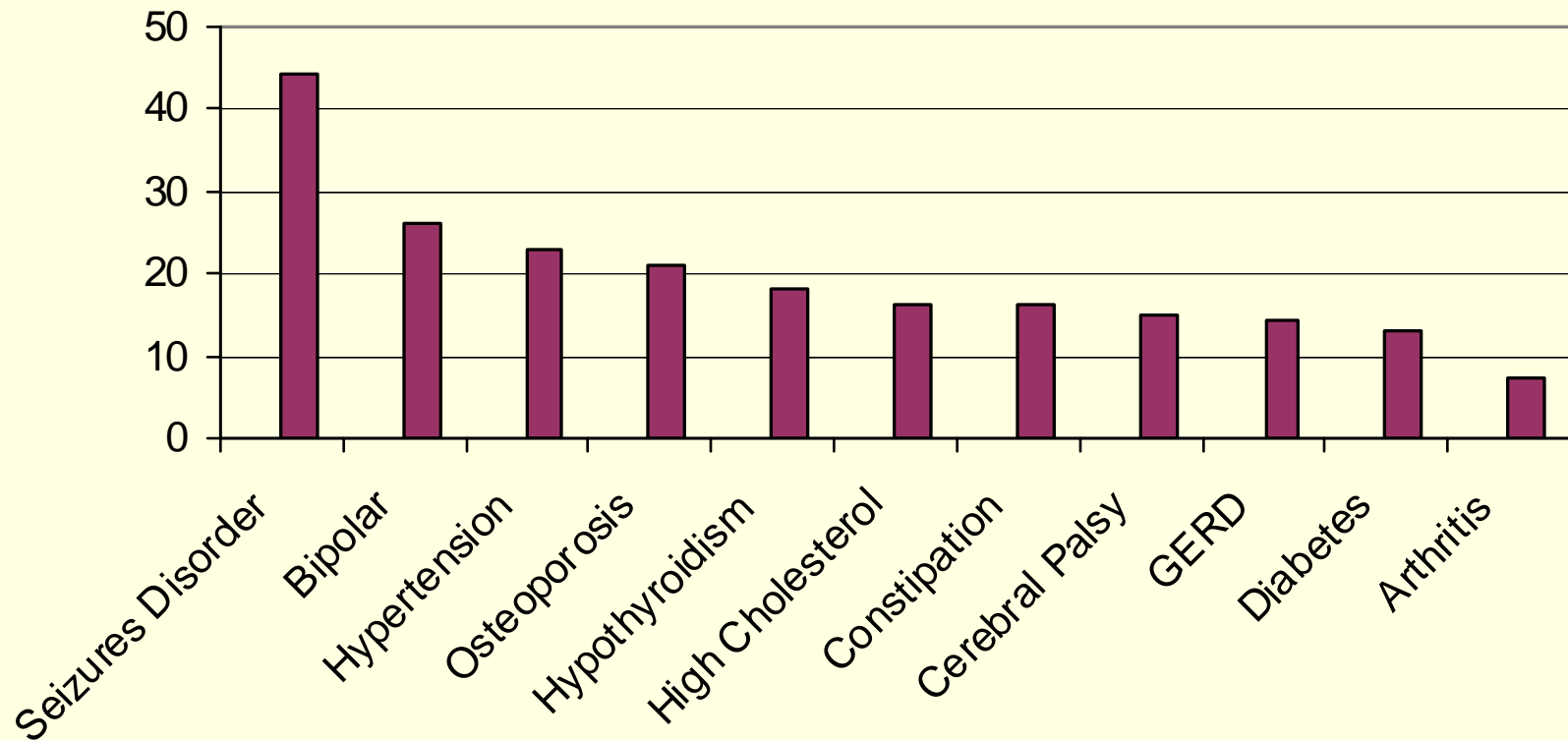
- Survey adapted from the Health and Home Household and Neighborhood Questionnaire (Butterfield, 2005).
- Two sections:
 - 61 question survey
 - 29 questions - Key variables
 - 20 questions - Home characteristics
 - 12 questions - Demographics
 - 11 item observational check list

Demographics

Agency Name	Number of Surveys/ Observations Expected	Refusal	Vacant	Number of Surveys/ Observations Completed
The Arc of AA	20	0	2	18
Bello Machre	20	1	0	19
Langton Green	20	0	0	20
TOTAL				57



Major Diagnosis of Home Residents



Findings

Q1. Frequency of home environmental health hazards?

- 9 out of 27 homes built before 1978 were not tested for lead
- 9 out of 57 homes contained mercury thermometers
- 56 out of 57 homes were not tested for radon

Findings

Q2. How frequently were protective measures in place?

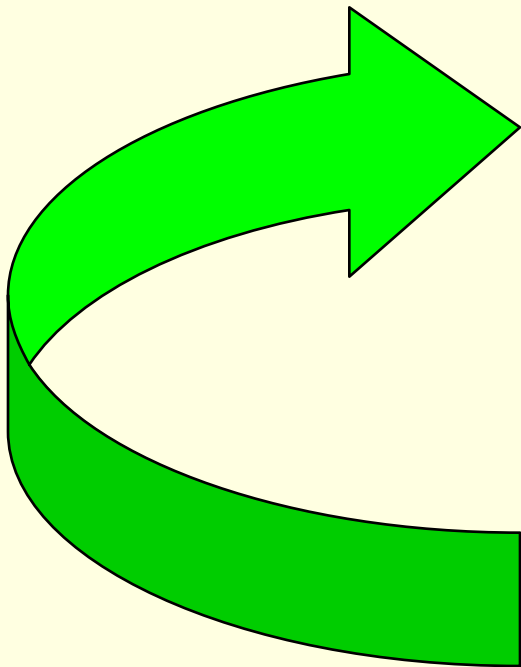
- 21 out of 28 homes with at least 1 one combustion source had no CO detector
- Carbon monoxide detectors were more likely to be in homes with a combustion source than without $X^2 (1, n=57) = 3.511, .05 < p < .1$.

Findings

Q3. Frequency of home practices creating risks?






- 86% of homes had a professional pesticide spraying contract
- 95% of homes reported using air fresheners
- 70% of homes had six or more cleaning supplies

The Nursing Process and Home Environmental Health Hazards

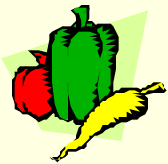


- Identification and assessment of risks and tools
- Prioritization of needs
- Interventions to minimize risk - Do the “doable”
- Implement plan and teach risk reduction
- Evaluate

Home Environmental Health and Safety Assessment Tool

	Assessment	Yes	No	N/A	Standard of Practice
	Home built before 1978	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Test homes built before 1978 for lead.
	Home tested for lead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Living space in basement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Maintain home to prevent chipping or peeling paint
	Attached garage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Home radon test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Remove shoes indoors • Test first three floors of all homes for radon
	Home radon ventilation system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Living space in basement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Do not idle cars in garage
	Combustion heating source	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Ensure proper venting of all combustion heating sources.
	Gas, kerosene or propane space heater	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Wood stove	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Annual assessment to ensure proper function. • Do not use grills, or generators indoors
	Fireplace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Gas dryer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Gas dryers, hot water heaters and stove need to vent outdoors
	Vented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Gas hot water heater	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Vented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Gas stove	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Well water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Routine well testing and maintenance of private wells.
	Lead pipes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Water tested for contaminants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Review consumer confidence reports for public water supply
	Known contaminants:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Smoke detector	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Smoke detector on all floors and in bedrooms
	Carbon monoxide detector	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Fire extinguisher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> • Carbon monoxide detector on all levels in homes with combustion source or garage
	Fire evacuation route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Emergency phone numbers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Disaster plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Shelter -in-place supplies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Assessment	Yes	No	N/A	Standard of Practice
Insects in home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> Use of integrated pest management techniques for controlling pests.
Rodents in home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
If yes what: _____				
Pesticide spraying in home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> Use least hazardous methods of pest control
If yes what / how often: _____				
Pesticide contract	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Frequency: _____				
Air freshener used in home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> Minimize use of air fresheners. Use less hazardous and irritating alternatives to control odors. Use of low VOC household cleaners and green cleaning techniques.
Candles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Plug-ins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Incense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
How many times per day: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Use of strong smelling cleaners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Tuna fish served in home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> See federal and state recommended fish consumption advisories Wash all fruits and vegetables before eating Consider organic or locally grown products
If yes, how often per week: _____				
Fresh fruit/vegetables used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Local/ organic products used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Mercury thermometer in house	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> Use non-mercury containing medical devices Dispose of all mercury devices and batteries per local hazard waste collection procedures
Other mercury devices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Needle boxes for needles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Use of traditional or cultural remedies containing mercury	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Smoking allowed in home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<ul style="list-style-type: none"> Institute no smoking indoors policy
House smells like smoke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Cigarette products present	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	



Resources

- National Library of Medicine Household Product Database (<http://householdproducts.nlm.nih.gov/>)
- National Library of Medicine Tox Town (<http://toxtown.nlm.nih.gov/>)
- Coalition to End Lead Poisoning (<http://www.lead-safe.org/>)
- EPA Carbon Monoxide (<http://www.epa.gov/iaq/co.html>)
- Environmental Working Group (<http://www.ewg.org>)
- Citizen's Guide to Radon (<http://www.epa.gov/radon/pubs/citguide.html>)
- Beyond Pesticides (<http://www.beyondpesticides.org>)

Recommendations

- Self-advocate, family, staff, and providers need information on home environmental health risks, steps to decrease risks and safer, low-cost alternatives
- On a national advocacy level, there is a need for home environmental health standards
- Developmental disabilities nurses and other visiting nurses can promote and protect health by incorporating home environmental health assessments into routine visits.

Recommendations

- On a regulatory level, there is a need to update the laws that govern community-based residential settings so they more comprehensively protect the health of this vulnerable population and their staff

Future Research

- Further studies with this population are needed to validate the findings of this study.
- Studies testing ambient and biological measures would provide more data on actual exposures in these community-based residential settings.
- There is a need to evaluate the occupational protections of live-in staff to and to educate agencies about current occupational protection laws.

Future Research

- No studies to date have looked at the workplace exposures faced by people with developmental disabilities in non-inclusive settings such as sheltered workshops and the effectiveness of state workplace laws to protect this population.
- It is necessary to explore similar residential settings such as assisted living, juvenile justice, and mental health to evaluate the exposures and protections in these similar settings for vulnerable populations

Questions

