Radon: New Jersey — Continued

dation is based on the limited feasibility of remediating residences with radon levels <4 pCi/L. Building code modification to prevent radon entry may be effective in reducing overall population risks from radon exposure (*2*), and appropriate New Jersey legislation has been enacted. Health-care providers in New Jersey should advise their patients, particularly those who smoke, of the health risks associated with radon exposure and should consider recommending indoor radon concentration testing.

References

1. Schoenberg JB, Wilcox HB, Mason TJ, et al. Variation in smoking-related lung cancer risk among New Jersey women. Am J Epidemiol 1989;130:688–95.
2. New Jersey State Department of Health. A case-control study of radon and lung cancer among New Jersey women: technical report, phase I. Trenton, New Jersey: New Jersey State Department of Health, 1989.
3. National Research Council. Health risks of radon and other internally deposited alpha-emitters: BEIR IV. Washington, DC: National Academy Press,1988.
4. Puskin JS, Nelson CB. EPA's perspective on risks from residential radon exposure. JAPCA 1989;39:915–20.
5. Samet JM. Radon and lung cancer. JNCI 1989;81:745–57.
6. Hess CT, Weiffenbach CV, Norton SA. Environmental radon and cancer correlations in Maine. Health Phys 1983;45:339–48.
7. Edling C, Kling H, Axelson O. Radon in homes—a possible cause of lung cancer. Scand J Work Environ Health 1984;10:25–34.
8. Svensson C, Pershagen G, Klominek J. Lung cancer in women and type of dwelling in relation to radon exposure. Cancer Res 1989;49:1861–5.
9. Axelson O, Anderson K, Desai G, et al. Indoor radon exposure and active and passive smoking in relation to the occurrence of lung cancer. Scand J Work Environ Health 1988; 14:286–92.
10. Nero AV, Schwehr MB, Nazaroff WW, Revzan KL. Distribution of airborne radon-222 concentrations in U.S. homes. Science 1986;234:992–7.

Update: Work-Related Electrocutions Associated with Hurricane Hugo — Puerto Rico

When Hurricane Hugo struck the northeastern corner of Puerto Rico on September 18, 1989, thousands of residents of low-lying and flood-prone areas escaped harm because of timely hurricane warnings and effective evacuation (*1*). In the postimpact phase of the storm, however, other dangers threatened persons making repairs in the devastated areas. Approximately 85% of the island was without power because of damage to power lines and poles. Energized downed power lines presented hazards for electric company repair crews and for members of communities affected by the hurricane. Thus far, six persons (all males) have been electrocuted in separate incidents attributable to hazards resulting from the hurricane (*1*). Five of these deaths were work-related.

In response to a request from the commonwealth epidemiologist, Puerto Rico Department of Health, a Fatal Accident Circumstances and Epidemiology (FACE) team from the National Institute for Occupational Safety and Health (NIOSH), CDC, assisted local health officials in the investigation of the five occupational electrocutions. A brief summary of the cases follows.

Electrocutions – Continued

Case 1. At 12 noon on September 20, a 35-year-old tree trimmer/crew leader was electrocuted when he contacted a dangling, energized power line. The line, believed to be de-energized, was receiving "feedback" electric current from portable emergency generators operated by local businesses.

Case 2. At 3:30 p.m. on September 21, a 42-year-old electric lineman with 19 years' experience was preparing to work on a power line believed to be de-energized. The line, however, was receiving "feedback" current from portable generators in use in the area, and the worker was electrocuted when he touched the line.

Case 3. At 8:45 p.m. on September 22, a 38-year-old electric lineman with 14 years' experience was electrocuted when he contacted a dangling, energized 4800-volt power line while working in a dark, wooded area.

Case 4. At 8:30 p.m. on September 28, a 30-year-old electric lineman with 6 years' experience was electrocuted while working from a bucket truck at night. He inadvertently activated and was unable to disengage the control lever that regulates movement of the bucket, resulting in movement of the bucket and worker into an adjacent energized power line.

Case 5. At 6:30 p.m. on September 28, a 28-year-old meter-reader who had been assisting a line crew was electrocuted when he touched an energized metal clothesline wire at a private residence. One of the metal poles supporting the clothesline wire was in contact with the metal roof of the house, on which an energized electrical line that had been torn from a pole was lying.

Based on the findings of the FACE investigation, recommendations were made to prevent the occurrence of similar incidents.

Reported by: P Rechani, Director, Instituto de Sciencias Forenses de Puerto Rico, San Juan; JV Rullan, MD, Commonwealth Epidemiologist, Div of Epidemiology, Puerto Rico Dept of Health. Div of Safety Research, National Institute for Occupational Safety and Health; Div of Environmental Hazards and Health Effects, Center for Environmental Health and Injury Control, CDC.

Editorial Note: Maintenance and repair of electric power lines is inherently hazardous, and U.S. electric linemen suffer an average electrocution rate of 33.4 per 100,000 workers per year—more than four times that of electricians, who suffer the second highest rate of electrocutions (8.3 per 100,000 workers) (*2*). This hazard greatly increases when repairs are conducted under conditions of widespread damage to electrical transmission and distribution systems, such as in the aftermath of a natural disaster like Hurricane Hugo. For example, in an effort to restore power as quickly as possible, experienced electric company personnel worked shifts of ≥24 hours, often in darkness and inclement weather. In addition, to expand the work force, electric company retirees and workers whose job responsibilities normally do not involve work near energized lines volunteered to assist in the power restoration effort. These workers may have been insufficiently familiar with appropriate safety precautions.

The use of portable generators to provide emergency power after natural disasters is of particular concern because of the increased potential hazard posed by electric lines assumed to be disconnected or de-energized. At least two of the work-related fatalities reported here were attributable, in part, to this hazard.

To assist in the prevention of similar incidents in the future, the following recommendations were provided by the NIOSH investigators to the Puerto Rico Department of Health and to electric company officials:

Electrocutions — Continued

- Electric company officials must assure that standard safe operating procedures are followed at all times by all employees; these procedures include inspection of each worksite to identify all potential hazards, verification that lines have been de-energized, grounding (on both the line and load sides of the work area) all lines that will be accessed, use of appropriate personal protective equipment (e.g., insulating gloves), and use of adequate portable lighting in low light or darkness.
- Company emergency preparedness plans should be reviewed and revised as necessary based on the experience with Hurricane Hugo and the deaths of these five workers.

Because at least one other (apparently nonoccupational) electrocution occurred in Puerto Rico after the storm, the following recommendations for the prevention of electrocutions were also developed for the community and provided to local officials.

(Continued on page 725)

TABLE I. Summary — cases of specified notifiable diseases, United States

Disease	42nd Week Ending			Cumulative, 42nd Week Ending		
	Oct. 21, 1989	Oct. 22, 1988	Median 1984-1988	Oct. 21, 1989	Oct. 22, 1988	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	757	U*	376	28,104	24,971	10,632
Aseptic meningitis	334	322	296	7,663	5,478	8,153
Encephalitis: Primary (arthropod-borne & unspec)	25	20	27	681	682	975
Post-infectious	3	2	1	70	106	97
Gonorrhea: Civilian	13,392	14,641	17,095	547,104	560,073	676,972
Military	235	241	422	9,194	9,430	13,533
Hepatitis: Type A	739	563	496	27,869	20,666	18,147
Type B	506	426	477	18,276	18,187	20,755
Non A, Non B	42	54	69	1,912	2,090	2,866
Unspecified	45	40	63	1,847	1,764	3,564
Legionellosis	24	25	25	858	802	620
Leprosy	-	4	4	136	126	188
Malaria	34	22	22	1,040	829	829
Measles: Total†	89	36	25	12,593	2,427	2,574
Indigenous	88	30	22	12,000	2,180	2,180
Imported	1	6	2	593	247	294
Meningococcal infections	34	29	40	2,142	2,311	2,213
Mumps	52	60	55	4,416	3,817	3,817
Pertussis	62	67	67	2,778	2,358	2,358
Rubella (German measles)	1	1	1	375	184	463
Syphilis (Primary & Secondary): Civilian	668	881	617	32,176	32,563	22,535
Military	4	1	2	197	130	134
Toxic Shock syndrome	5	8	9	300	298	298
Tuberculosis	344	411	406	17,001	17,145	17,145
Tularemia	3	3	4	130	160	160
Typhoid Fever	5	11	9	403	322	297
Typhus fever, tick-borne (RMSF)	14	21	13	572	554	631
Rabies, animal	58	75	103	3,789	3,543	4,386

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis (Hawaii 2)	75
Botulism: Foodborne	21	Plague	4
Infant (La. 1)	15	Poliomyelitis, Paralytic	-
Other	4	Psittacosis	84
Brucellosis (Calif. 2)	71	Rabies, human	1
Cholera	-	Tetanus (Calif. 1)	36
Congenital rubella syndrome	2	Trichinosis	15
Congenital syphilis, ages < 1 year	165		
Diphtheria	3		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.

CENTERS FOR DISEASE CONTROL

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

October 27, 1989 / Vol. 38 / No. 42

Epidemiologic Notes and Reports

Radon Exposure Assessment — Connecticut

In 1985, indoor air radon (radon-222) levels were found to be elevated in households in Pennsylvania (*1*). Following this discovery, the Connecticut Department of Health Services (CDHS) received inquiries from citizens who requested that their household air be tested for the presence of radon. Because information regarding radon exposures in Connecticut did not exist, CDHS initiated a series of surveys/projects to characterize this potential problem.

In the first survey (Connecticut Radon Survey), carried out from 1985 through 1987, indoor radon sampling was done in 202 homes in 44 towns in areas with suspected high potential for radon. Indoor air radon levels in the homes were sampled using alpha-track devices (one per home) placed in the lowest lived-in area of each home for 3 months. Because radon levels are typically highest during the winter, all homes were sampled for radon in December, January, and February. Radon levels ranged from 0.1 picocuries per liter (pCi/L) to 24.6 pCi/L (geometric mean: 1.3 pCi/L) (Table 1). Eleven percent exceeded the Environmental Protection Agency (EPA) maximum exposure guideline of 4 pCi/L.

TABLE 1. Summary of indoor air radon surveys conducted by the Connecticut Department of Health Services

Characteristic	Connecticut Radon Survey (n=202)		EPA-Connecticut Survey (n=1157*)		Household Testing Program (n=3409)	
Bias[†]	High		Neutral		High	
Survey device	Alpha-track		Charcoal		Charcoal	
	Results					
Location of measurement	% >4 pCi/L[§]	Geometric mean (pCi/L)	% >4 pCi/L	Geometric mean (pCi/L)	% >4 pCi/L	Geometric mean (pCi/L)
Basement	NT[¶]	NT	19%	2.1	21%	2.1
Lived-in area	11%	1.3	NT	NT	10%	1.3

*Number of detached houses out of 1425 total homes tested.
[†]Bias toward geologic locations with a higher probability of finding high radon homes.
[§]Picocuries per liter.
[¶]Not tested.