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Deaths Due to Hypothermia in Virginia

A review of death certificates in Virginia for the period January, 1978 through December, 1982 reveals that there have been 188 deaths for which accidental hypothermia was listed as the primary contributing cause of death. The total number of deaths per year were as follows: 35, 1978; 24, 1979; 32, 1980; 55, 1981; 42, 1982. The average annual death rate due to accidental hypothermia for these years increased with advancing age as demonstrated in Figure 1. Persons 70 years of age or older constitute only about 6% of Virginia's population but accounted for almost 30% of the reported deaths due to hypothermia. The risk of death due to hypothermia was approximately 400 times greater for persons 85 years of age or older than for those under 20 years of age. Figure 2 demonstrates that males were at greater risk than females and blacks were at greater risk than whites. The corresponding average annual death rates were 3.7 deaths per 100,000 for black males, 0.58 deaths per 100,000 for white males, 0.92 deaths per 100,000 for black females and 0.13 per 100,000 for white females. As would be expected, hypothermia-related deaths were most frequent in the winter months of January and February shown in Figure 3. Almost 40% of deaths, however, occurred during the remainder of the year.

Hypothermia-related deaths are probably underreported. As can be seen in Table 1, the clinical signs are not diagnostic and are easily mistaken for other conditions. In addition, most clinical thermometers are not able to record body temperature extremes. Due to the lack of specific pathologic changes, deaths resulting from hypothermia cannot be proven even by autopsy.

Studies conducted in the United Kingdom reveal that the elderly are especially prone to hypothermia-related deaths.[1,2] Elderly persons living alone, frequently on limited incomes, often do not adequately heat their homes. Impaired peripheral vasoconstriction in the elderly results in relative insensitivity to lower ambient temperatures. Frequently chronic illnesses complicate the lives of elderly persons causing them to be more susceptible to trauma and subsequent immobility which further increases the risk of significant losses of body heat. In addition, muscle mass generally decreases with age thus limiting the body's capacity to maintain its normal core temperature through shivering.[1]

It is not clear why blacks are at a much greater risk for hypothermia-related deaths than are whites. Since poor living conditions and substandard housing increase the risk of death due to hypothermia, it is reasonable to speculate that these data reflect the overall lower socioeconomic status of blacks in the Commonwealth of Virginia. It is also not readily apparent why males were more likely to die from hypothermia than females. This observation may in part be due to the greater participation by men in outdoor activities during cold weather and the higher incidence of serious ethanol intoxication among men.[3] Alcoholics are the group most at risk for deaths due to hypothermia in the United States.[1] Ethanol is a vasodilator and a central nervous system depressant predisposing even healthy individuals to hypothermia during cold weather.

Hypothermia deaths, as might be expected, occur most frequently in the winter months but are by no means limited to this time of the year. Winds of only twelve miles per hour increase the rate of heat loss by five-

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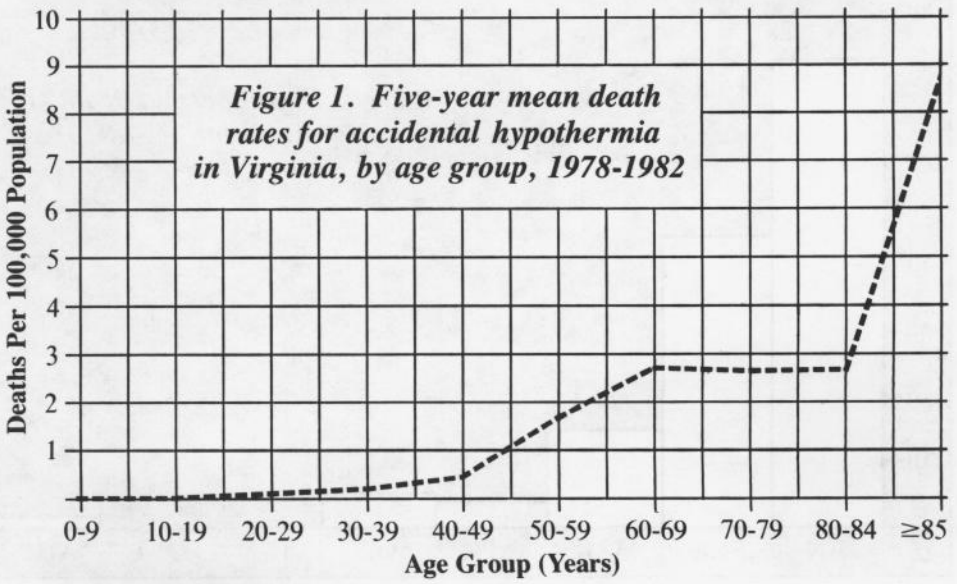


Figure 1. Five-year mean death rates for accidental hypothermia in Virginia, by age group, 1978-1982

Figure 2. Five-year mean death rates for accidental hypothermia in Virginia, by gender and race, 1978-1982

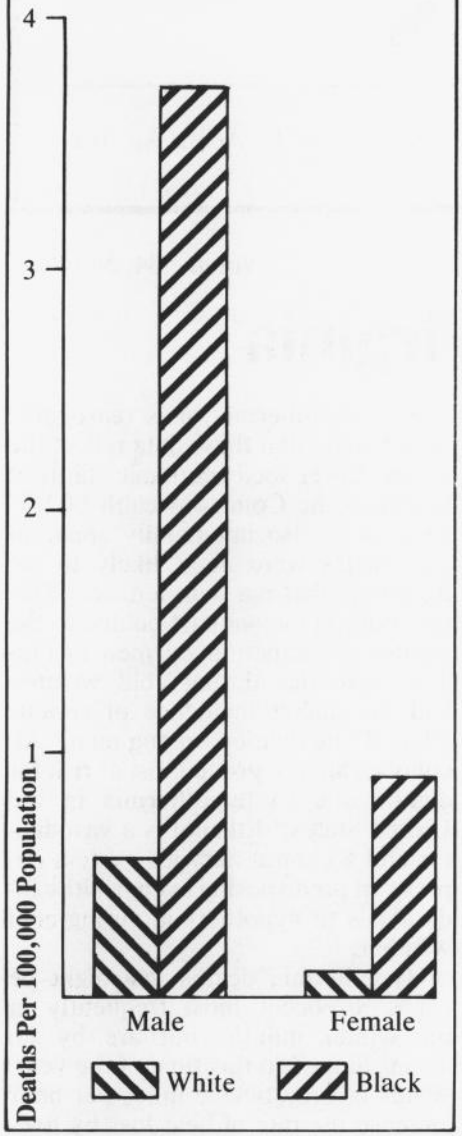


Table 1. Signs of hypothermia by core body temperatures[5]

Core body temperature	Clinical signs
35 C (95 F)	Shivering, impaired ability to perform tasks
33-35 C (91-95 F)	Poor judgment, impaired mentation, slurred speech, clumsiness, dilated pupils, ileus
30-33 C (86-91 F)	Muscle rigidity, cyanosis, edema
27-30 C(81-86 F)	Loss of consciousness, slowing of respirations and heart rate
26-27 C (78-81 F)	Pulmonary edema, severe respiratory depression, severe cardiac arrhythmias leading to ventricular fibrillation
26 C (below 78 F)	Flat EEG, cardiac and respiratory arrest

Continued from page 1

fold and wet clothing can account for as much as a twentyfold increase in body heat loss.[2] The greatest source of heat loss in clothed individuals is through the head, a fact that is frequently overlooked.[4]

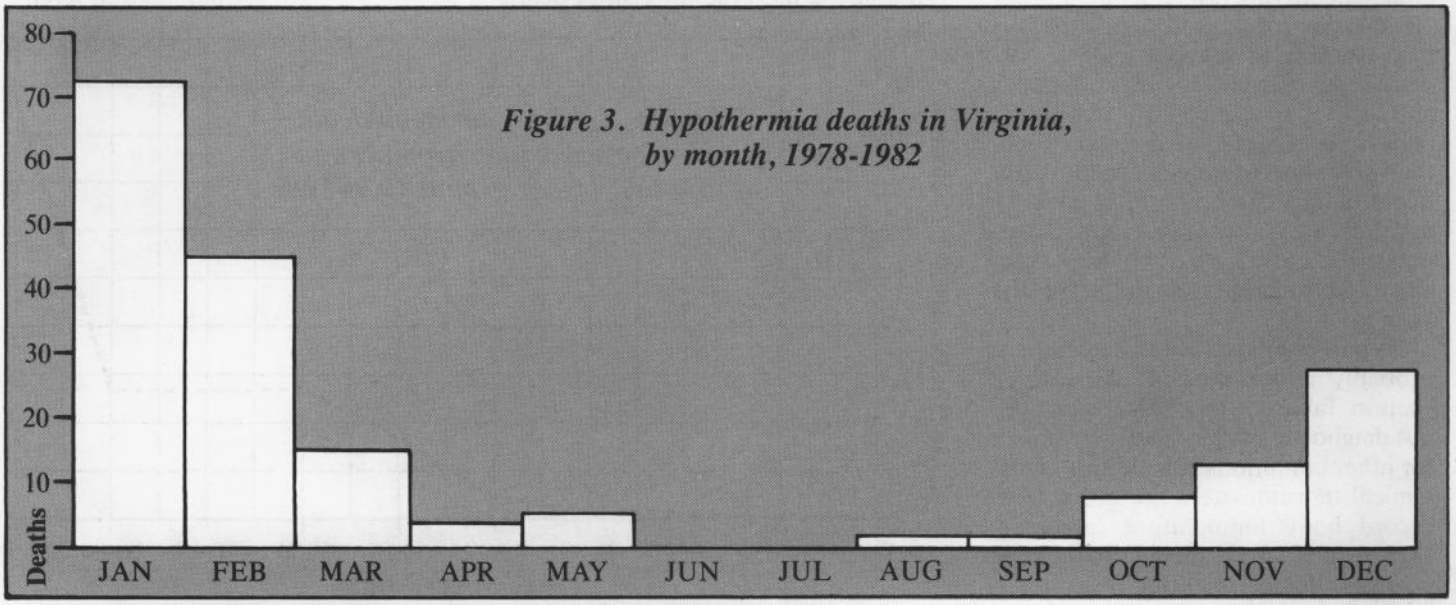
Physicians need to be aware of the signs of hypothermia (clinically defined as a core body temperature of less than 35°C or 95°F)[5] in the various risk groups so that appropriate treatment can be started as quickly as possible. Since hypoglycemia frequently accompanies hypothermia and ethanol intoxication, it is currently recommended that an intravenous line of 50% dextrose solution be started on suspected hypothermia victims unless serum glucose levels are known to be satisfactory.[4] Patients with extreme hypothermia must be carefully rewarmed while vital functions are closely monitored. These patients are particularly susceptible to ventricular arrhythmias, especially during rewarming, and medical personnel must be prepared to manage this complication.[1,6]

(Submitted by Russell E. Somers, M.D., Division of Epidemiology)

References

1. Reuler JB. Hypothermia: pathophysiology, clinical settings, and management. Ann Intern Med 1978; 89: 519-27.
2. Hypothermia (edit.). Ann Intern Med 1978; 89: 565-67.
3. Centers for Disease Control. Alcohol-related deaths-United States, 1968-1978. MMWR 1983; 32: 649-51.
4. Centers for Disease Control. Exposure-related hypothermia deaths-District of Columbia, 1972-1982. MMWR 1982; 31: 669-671.
5. Centers for Disease Control. Hypothermia-United States. MMWR 1983; 32: 46-48.
6. Weyman AE, Greenbaum DM, Grace WJ. Accidental hypothermia in an alcoholic population. Am J Med 1974; 56: 13-21.

Figure 3. Hypothermia deaths in Virginia, by month, 1978-1982



Influenza Reports Up Sharply

As shown in Figure 4, reported cases of influenza-like illness by 35 sentinel physicians in Virginia increased sharply during the month of February. Although no influenza viruses have yet been isolated by the Consolidated Laboratory (DCLS), few throat washing specimens have been received by DCLS and the isolation procedure takes several weeks to complete; as such, a delay can be expected before any "outbreak strain" is fully characterized. Four cases have been confirmed serologically by DCLS. Paired sera from two cases showed a fourfold rise in titer against influenza A/Philippines/82 (H3N2) and two showed a similar rise against type A/England/80 (H1N1). The influenza vaccine for the current season contains antigens of A/Brazil/78 (H1N1), A/Philippines/82 (H3N2), and B/Singapore/79 viruses. Measurement of antibody responses of persons vaccinated against the A/Brazil antigen indicate that they should be protected against the A/England strain as well.[1]

Reference

1. Centers for Disease Control. Influenza vaccines, 1983-1984. MMWR 1983; 32: 333-7.

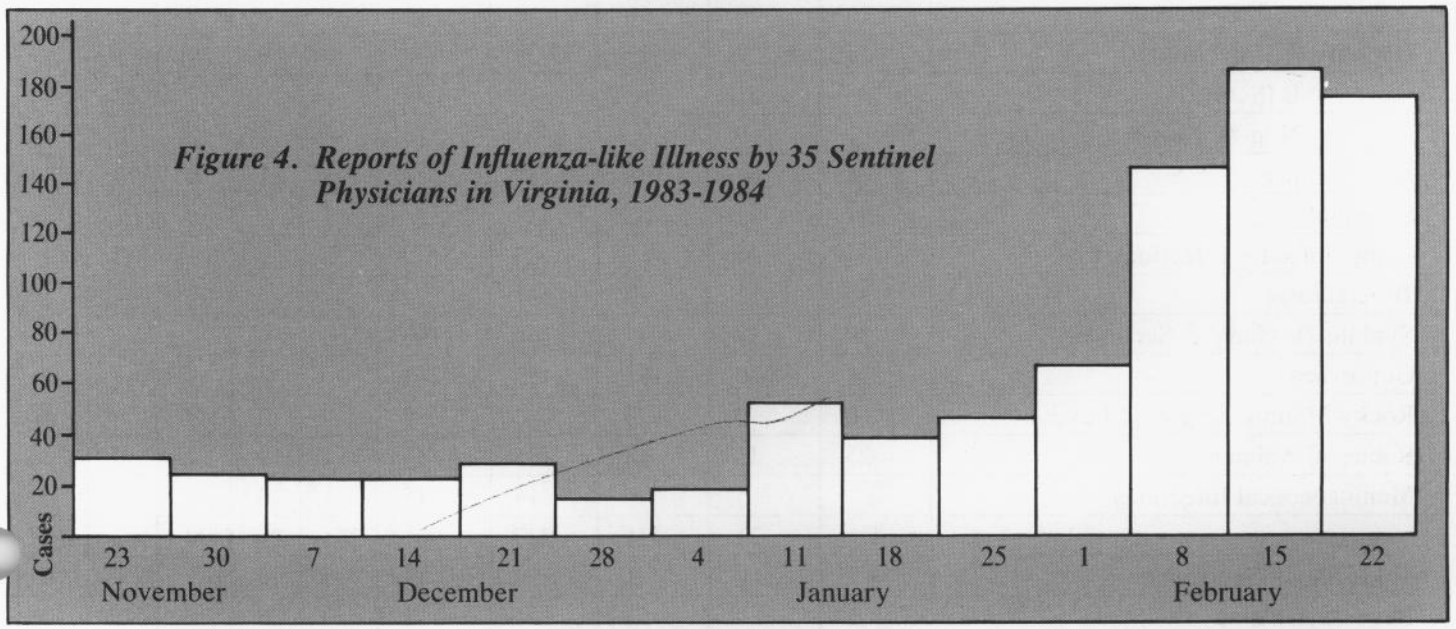


Figure 4. Reports of Influenza-like Illness by 35 Sentinel Physicians in Virginia, 1983-1984

A Symposium—June 21-23, 1984

Infectious Diseases in Day Care: Management and Prevention

Sponsored by:
The Minnesota Department of Health
University of Minnesota
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The fee for the conference is $175 for all registrations received prior to April 1, 1984. Following the registration deadline of April 1, 1984, the registration fee will be $225. **Registration is limited and application for registration should be sent as early as possible to ensure admittance.** Registration is personal, nontransferable, and made for the entire period. A $50 cancellation fee will be assessed all cancelled registrations. A partial refund of the registration fee will be made if the registration is cancelled in writing by June 1, 1984. The Minnesota Department of Health and the University of Minnesota reserve the right to cancel the conference if necessary.

The registration fee includes tuition, instructional materials, refreshment breaks, CEUs, professional credit, two lunches, and a copy of the conference proceedings, which will be published in *Reviews of Infectious Diseases*.

The purposes of this symposium are to characterize infectious diseases in day care and to develop appropriate prevention and management measures. Specific objectives of the symposium are to:

- summarize state-of-the-art knowledge regarding transmission and prevention of infectious diseases among children in day care
- stimulate exchange of this information across the disciplines of clinical medicine, public health, child day care, and public policy
- develop recommendations for further action
- disseminate conference proceedings to appropriate groups.

For Further Information Contact:
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Month: February, 1984

Disease	State					Regions				
	This Month	Last Month	Total to Date 1984	Total to Date 1983	Mean 5 Year To Date	This Month N.W.	N.	S.W.	C.	E.
Measles	1	0	1	2	18	0	0	0	1	0
Mumps	1	1	2	8	19	0	0	0	0	1
Pertussis	1	4	5	7	3	1	0	0	0	0
Rubella	0	0	0	1	2	0	0	0	0	0
Meningitis—Aseptic	9	18	27	28	19	1	3	2	0	3
**Bacterial	16	34	50	58	41	1	6	3	5	1
Hepatitis A (Infectious)	4	7	11	26	38	0	0	3	1	0
B (Serum)	45	41	86	79	72	2	16	4	12	11
Non-A, Non-B	7	9	16	14	*10	1	2	2	0	2
Salmonellosis	62	66	128	132	123	6	11	9	13	23
Shigellosis	21	41	62	27	43	2	0	0	1	18
Campylobacter Infections	31	24	55	59	*25	5	9	1	7	9
Tuberculosis	36	12	48	41	—	—	—	—	—	—
Syphilis (Primary & Secondary)	39	38	77	100	100	6	6	4	7	16
Gonorrhea	1,521	1,660	3,181	3,183	3,243	—	—	—	—	—
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0	0
Rabies in Animals	25	13	38	105	34	4	19	2	0	0
Meningococcal Infections	1	5	6	14	15	1	0	0	0	0
Influenza	410	21	431	237	981	241	29	90	12	38
Toxic Shock Syndrome	1	0	1	0	1	0	0	1	0	0
Reyes Syndrome	1	0	1	1	2	0	0	0	1	0
Legionellosis	1	0	1	3	3	0	0	0	1	0
Kawasaki's Disease	3	0	3	10	5	1	0	1	1	0
Other:	—	—	—	—	—	—	—	—	—	—

Counties Reporting Animal Rabies: Alexandria 4 raccoons; Arlington 3 raccoons; Fairfax 1 bat, 4 raccoons; Loudoun 7 raccoons; Louisa 2 raccoons; Orange 1 raccoon; Scott 1 skunk; Spotsylvania 1 raccoon; Washington 1 skunk.

Occupational Illnesses: Occupational hearing loss 6; Occupational pneumoconiosis 13; Asbestosis 6; Occupational dermatoses 2; Carpal tunnel syndrome 4.

*4 year mean
**other than meningococcal

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