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Texas Preventable Disease NEWS

contents:

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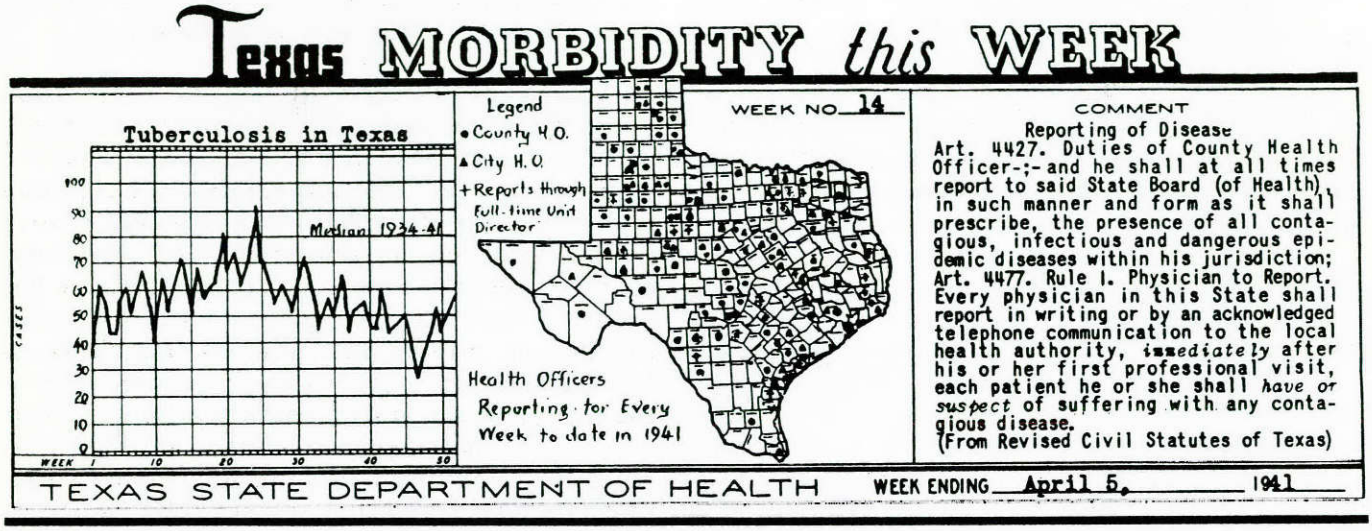

INSECT REPELLENTS*

Insect repellents have been used on the skin for many years, primarily to prevent mosquito bites. With recent increased concern about Lyme disease, skin and clothing repellents are now also recommended for protection against ticks.

SKIN REPELLENTS -- Currently available insect repellents for application to the skin (*Off!* and others) are usually effective for one to several hours, but can be removed by absorption, evaporation, rain, sweating, swimming, or wiping and must be reapplied to maintain effectiveness. The most effective topical insect repellent known is N,N-diethyl-m-toluamide, commonly called "deet." Deet repels a variety of mosquitoes, chiggers, ticks, fleas, and biting flies; no topical repellent is effective against insects such as bees and wasps. The US Armed Forces have long used 74% deet in ethanol, but several products that equal or exceed this concentration are now available commercially. A new long-acting deet formulation, which is expected to be available to the Armed Forces this summer and commercially available next year, contains 35% deet with an added polymer; the polymer apparently prevents loss of deet from the skin surface through absorption and evaporation.

Other repellents effective against both mosquitoes and ticks, but less so than deet, include 2-ethyl-1,3-hexanediol (Rutgers 612) and dimethyl phthalate. Citronella-based repellents (*Natrapel* and others) may provide short-term protection against mosquitoes, but are probably not effective against ticks.

A CLOTHING REPELLENT -- Permethrin, actually a pesticide rather than a repellent, is used for treatment of lice (Nix - Medical Letter, 28:89, 1986) and is also marketed as a clothing spray for protection against both mosquitoes and ticks. The aerosol is available in many areas of the USA as *Permanone Tick Repellent*, sold mostly in lawn and garden stores or sports stores. Manufactured by Fairfield American in Newark, NJ and distributed by Coulston International, Easton, PA, it is non-staining, nearly odorless and resistant to degradation by light, heat, or immersion in water.

CLINICAL TRIALS -- MOSQUITOES -- A field trial conducted with US Air Force volunteers in an area of Alaska with a large population of

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mosquitoes, but few mosquito-borne diseases, tested both the new 35% long-acting cream formulation of deet applied to exposed skin and permethrin treatment of clothing. The deet formulation provided greater than 99% protection for more than eight hours (a mean of four mosquito bites per person per hour), while a permethrin-treated uniform (0.125mg/cm^2) alone provided 93% protection (78 mosquito bites/hour), compared to 1,188 bites per hour with no protection; using both deet on skin and permethrin on clothing provided 99.9% protection (one bite/hour) (TH Lillie et al, J Med Entomol, 25:475, 1988). Another trial conducted in Pakistan eight hours after application of the same long-acting deet formulation found that the combination of deet and permethrin-treated clothing provided 100% protection from mosquito bites: long-acting deet repellent alone gave 89% protection (a mean of 3.9 bites), compared to 57% (14.8 bites) with treated clothing alone and 34.4 bites with no repellent (LL Sholdt et al, J Am Mosq Control Assoc 4:233, 1988).

An earlier field trial in Australia had found two long-acting repellents (3M Insect Repellent Lotion, 33% deet; Biotek *Long-Acting Insect Repellent*, 42% deet) no more effective (56% and 61% protection over 14 hours) than the standard military formulation of 75% deet (54% protection) in preventing bites. Any one of the three used together with permethrin treated clothing provided the most protection (74%, 82%, and 80%) (RK Gupta et al, J Am Mosq Control Assoc, 3:556, 1987).

TICKS -- A pressurized spray of 0.5% permethrin was compared with 20% and 30% concentrations of deet for use on military field uniforms in an area of Cape Cod infested with *Ixodes dammini*, the principal vector of Lyme disease (and babesiosis) in the northeastern USA. A one-minute application of permethrin provided 100% protection, compared to 85% and 92% protection with one-minute applications of 20% and 30% deet (CE Schreck et al, J Med Entomol, 23:396, 1986). Permethrin-treated clothing has also been effective against ticks found in California (RS Lane and JR Anderson, J Med Entomol, 21:692, 1984).

SKIN-SO-SOFT -- A commercial concentrated bath oil, Avon *Skin-So-Soft*, has come into wide use as a "folk medicine" mosquito repellent. This product contains di-isopropyl adipate, mineral oil, isopropyl palmitate, dioctyl sodium sulfosuccinate, fragrance, and the sunscreen benzophenone-11. In one study, the bath oil did repel *Ae. aegypti*, the mosquito carrier of yellow fever (LC Rutledge et al, Mosquito News, 42:557, 1982) but, according to Medical Letter consultants, *Skin-So-Soft* may protect against mosquitoes for as little as 10 to 30 minutes, and the safety of repeated, widespread application of the concentrated bath oil to the skin is unknown.

ADVERSE EFFECTS -- Deet is absorbed through the skin into the systemic circulation; about 10% to 15% of each dose can be recovered from the urine. Toxic and allergic reactions have been reported. The drug has been associated with bullous eruptions in the antecubital fossa and contact urticaria, and toxic encephalopathy has occurred with excessive or prolonged use, particularly in infants and children (DL Edwards and CE Johnson, Clin Pharm, 6:496, 1987). With the higher concentrations now available, brief exposure to smaller amounts has caused serious reactions in children and adults, including anaphylaxis and grand mal seizures (JD Miller, N Engl J Med, 307:1341, 1982; EH Roland et al, Can Med Assoc J, 132:155, 1985). Ingestion of deet can be fatal; two of five patients aged one to 33 years died following coma, seizures, and hypotension that occurred within one hour after ingestion (M Tenenbein, JAMA, 258:1509, 1987).

Permethrin is toxic to the nervous system of insects but, in mammals, the drug is poorly absorbed and then rapidly inactivated by ester hydrolysis. Objective signs of skin toxicity such as edema, erythema, and rash have been uncommon, and adverse systemic effects have not been reported.

CONCLUSION -- Deet-containing insect repellents applied to the skin or clothing can help prevent mosquito and tick bites, but deet may cause allergic and toxic effects in children and adults, especially when used on the skin repeatedly in high concentrations. Wearing protective clothing treated with permethrin in addition to using deet on exposed skin provides the greatest degree of protection against mosquito and tick bites.

TUBERCULOSIS CONTROL DIVISION NOTES

Trends: There were 1,915 cases (11.0/100,000 population) of tuberculosis reported in Texas in 1989 compared with 1,901 in 1988. Tuberculosis rates were highest in public health regions bordering Mexico and in the southern areas of the state. Sixty-four percent of these cases were in Public Health Regions 3, 4, 6, and 8; 56% were reported in the seven major metropolitan areas in the state. Of the total state morbidity, Harris County (Houston) accounted for 28% and Dallas County for 14%.

One of the most significant trends in tuberculosis morbidity in Texas is the increasing proportion of cases in minorities. Blacks and Hispanics represent 12% and 21% of the total Texas population, respectively. Of the 1,915 cases reported, 28% (529 cases) were black, 38% (737 cases) were Hispanic, and 28% (528 cases) were non-Hispanic whites. 1989 is the first year that more blacks than non-Hispanic whites were reported as tuberculosis cases.

In 1980, 2,075 tuberculosis cases were reported in Texas. Non-Hispanic whites accounted for 711 cases, for a case rate of 9.0 per 100,000. In 1989, tuberculosis morbidity among this population declined to 528 cases, with a case rate of 5.0 per 100,000. In addition, cases and rates among Hispanics declined from 794 (26.6 cases/100,000) in 1980 to 739 (18.3 cases/100,000) in 1989. Tuberculosis among blacks showed an opposite trend. In 1980, blacks accounted for 418 cases (24.7 cases/100,000), but in 1989, 529 (26.7 cases/100,000) were reported. Thus, while case rates among non-Hispanic whites and Hispanics have decreased by 44% and 31%, respectively, the rate among blacks has increased by 8% from 1980 to 1989.

* * *

VACCINE-PREVENTABLE DISEASE UPDATE
PROVISIONAL DATA
Weeks 8-12

CONFIRMED AND SUSPECTED MEASLES

County	Latest Rash Onset	# Cases	Affected Population
Bastrop	03/13/90	6	All age groups
Bell	03/14/90	6	Pre-school
Bexar	03/22/90	2	Adult
Bosque	03/18/90	3	Pre-school, School-age
Brazos	03/22/90	23	All age groups
Brown	03/10/90	1	Adult
Burleson	03/05/90	2	School-age, Adult
Cameron	03/19/90	44	All age groups
Camp	02/25/90	1	Pre-school
Cass	03/15/90	1	School-age
Cherokee	03/03/90	2	Adult
Collin	03/19/90	46	All age groups
Comal	03/22/90	2	School-age, Adult
Cooke	03/19/90	8	All age groups
Coryell	03/12/90	14	School-age, Adult
Dallas	03/21/90	1,396	All age groups
Denton	03/21/90	60	All age groups
El Paso	03/20/90	184	All age groups
Ellis	03/19/90	50	All age groups
Fannin	02/27/90	2	Pre-school, School-age
Franklin	03/02/90	2	School-age, Adult
Freestone	03/12/90	1	School-age
Frio	03/20/90	2	All age groups
Gaines	03/12/90	4	Pre-school
Gregg	03/10/90	5	All age groups
Grimes	03/21/90	9	Pre-school, School-age
Haskell	03/19/90	1	Pre-school
Henderson	03/15/90	1	Pre-school
Hidalgo	03/23/90	16	Pre-school, School-age

CONFIRMED AND SUSPECTED MEASLES

County	Latest Rash Onset	# Cases	Affected Population
Jasper	02/24/90	2	Pre-school, Adult
Jefferson	03/20/90	9	School-age, Adult
Karnes	03/12/90	2	Pre-school
Kaufman	03/04/90	16	All age groups
Lampasas	02/27/90	2	Pre-school
Lee	03/15/90	3	Pre-school, Adult
Limestone	03/15/90	3	Pre-school, Adult
McLennan	03/15/90	16	All age groups
Montague	03/10/90	5	All age groups
Morris	02/24/90	8	Pre-school
Nacogdoches	03/12/90	3	Pre-school, College
Nueces	03/18/90	1	Pre-school
Orange	02/25/90	1	Adult
Parker	03/18/90	7	Pre-school, College
Reagan	03/01/89	1	Pre-school
Reeves	03/04/90	1	School-age
Robertson	03/21/90	1	Pre-school
Smith	03/18/90	14	All age groups
Tarrant	03/15/90	99	All age groups
Titus	03/18/90	14	All age groups
Travis	03/22/90	79	All age groups
Van Zandt	03/07/90	3	Pre-school, Adult
Webb	03/16/90	135	All age groups
Willacy	02/24/90	2	School-age
Williamson	03/13/90	1	Pre-school
Wilson	03/14/90	1	School-age
Wise	02/27/90	1	School-age
Wood	03/17/90	9	Pre-school, Adult
Total		2,333	

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