

Extreme Cold Events – Health Impacts, Surveillance and Public Perception of Warnings

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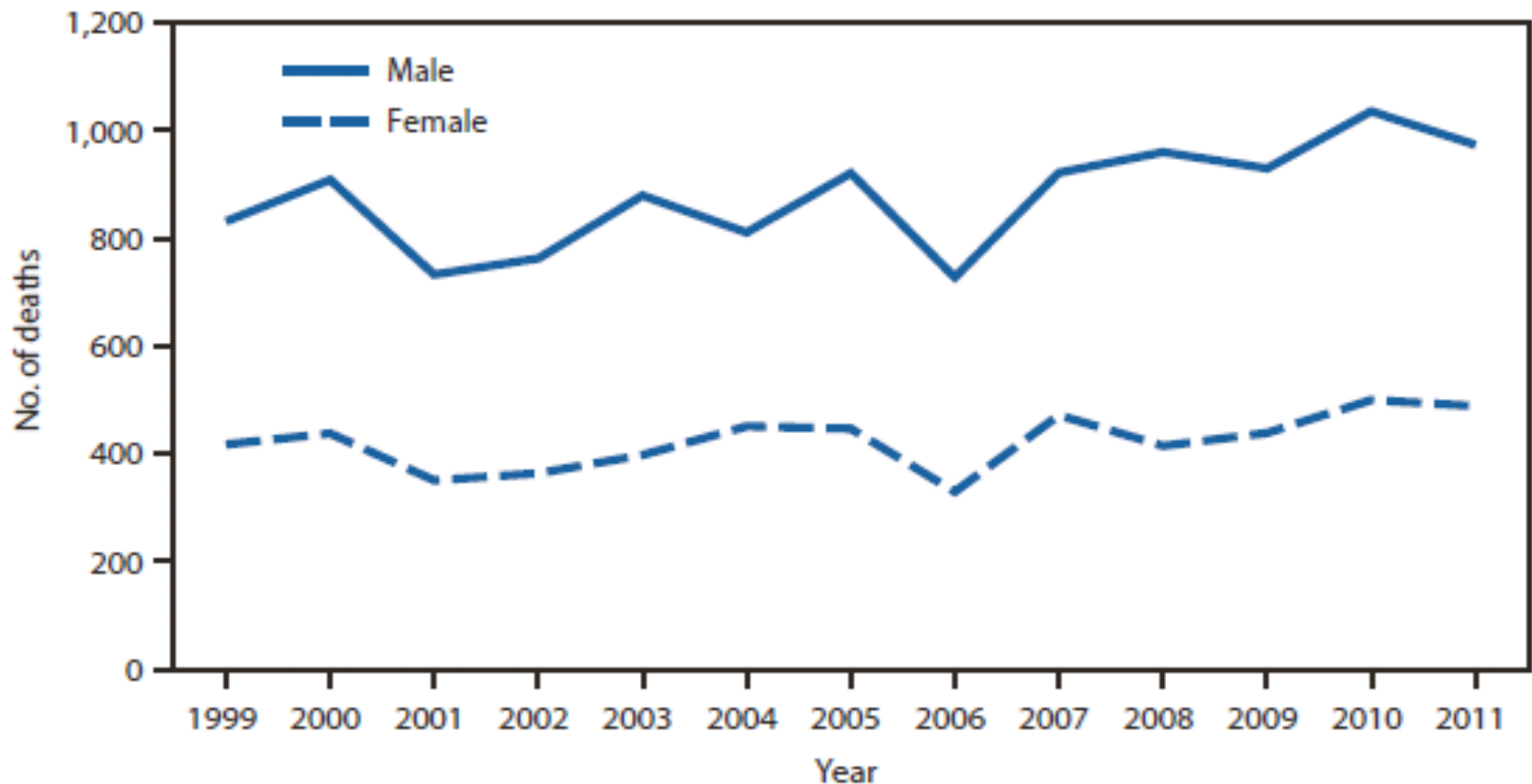
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Winter Weather Public Health Impacts

- **Hypothermia-related injuries and deaths**
- **Carbon monoxide poisoning**
- **Other injuries and deaths from**
 - Household fires
 - Motor vehicle crashes
 - Slips, trips, and falls
 - Myocardial Infarction (heart attacks)

Hypothermia-Related Deaths by Sex — US 1999–2011

average of 1,301 per year



Risk Factors During Winter Weather

- **Hypothermia and frostbite associated with environmental cold exposure**
 - > 65 years of age
 - Babies sleeping in cold bedrooms
 - Being outdoors for long periods—the homeless, hikers, hunters, ice fishing etc.
 - Altered awareness due to alcohol or illicit drugs

Risk Factors During Winter Weather (2)

- **Use of alternative heat sources - carbon monoxide poisonings and house fires**
 - Indoor charcoal grills are a major source of carbon monoxide (CO) exposure during winter storms
 - 50% of home heating fires occur in winter from candles, unattended fireplace, and space heaters
- **Injuries associated with snow and ice**
 - Motor vehicle crashes
 - Falls

Public Health Surveillance

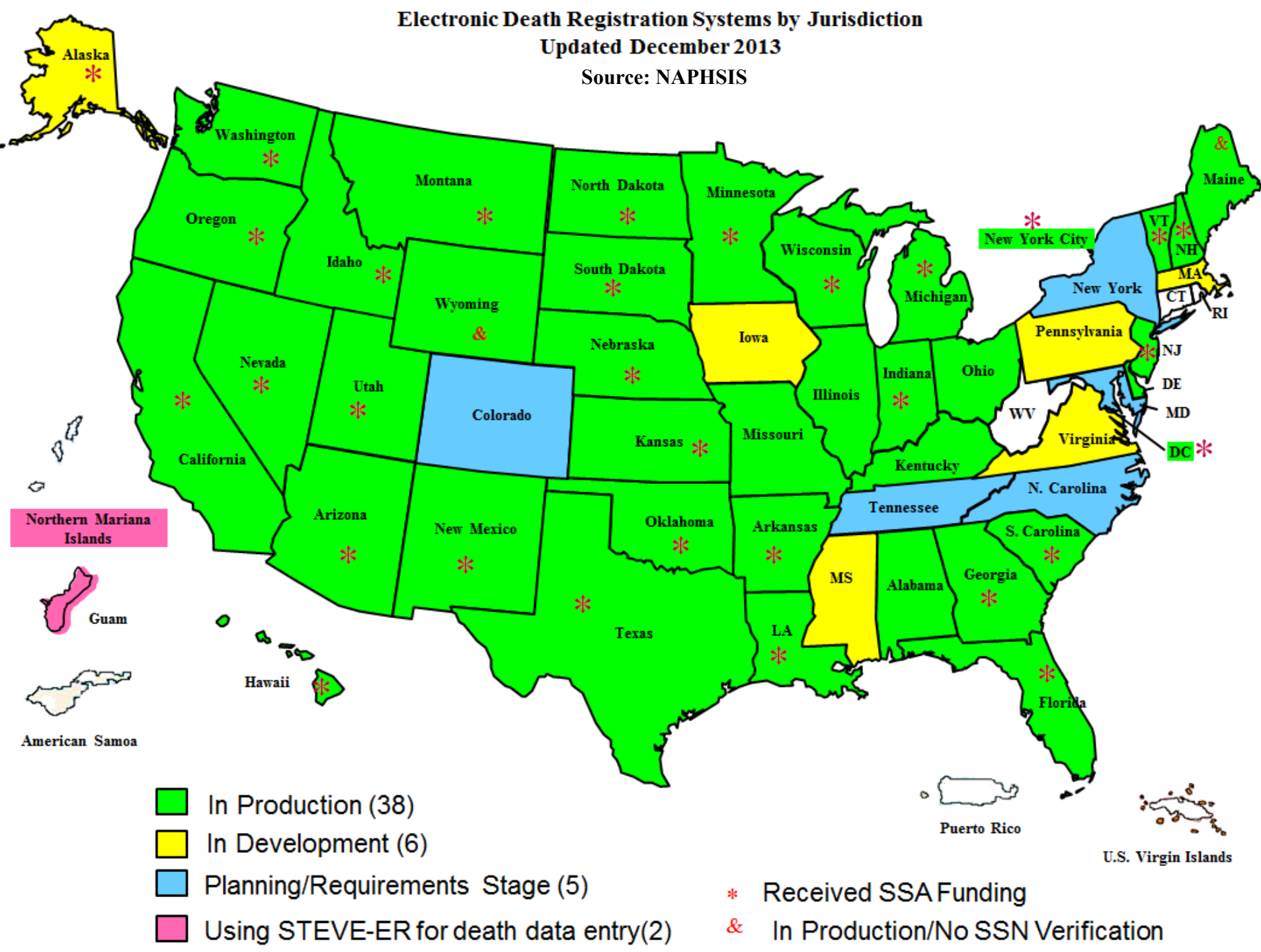
Health Effects of Cold Events

- **Syndromic**
 - <http://www.syndromic.org/resources/isds-webinars/upcoming-recent/723-biosense2-webinar-cold-weather>
- **CO Surveillance**
 - <http://www.cdc.gov/co/surveillance/routine.htm>
- **Electronic Death Registration System (eDR)**
 - <http://www.syndromic.org/resources/isds-webinars/upcoming-recent/722-edrs-mortality-surveillance>

Electronic Death Registration Systems by Jurisdiction

Updated December 2013

Source: NAPHSIS



Communicating Winter Weather Information to the Public

- **National Weather Service (NWS) impact-based messaging**
 - What can happen under specific conditions
 - Comparison to previous events
- **Public health targets vulnerable populations**
 - At-risk population(s)
 - Language issues
- **Know main source(s) for weather information**

CDC-NWS Extreme Cold Warning Study Bismarck, North Dakota (2012)

Main source of severe winter weather information

Main Information source	Frequency (n=188)	% of HH	Projected HH	Weighted %	95% CI
TV	149	79.3	27,839	81.0	73.8 – 88.1
Internet	11	5.9	2,036	5.9	1.8 –10.1
NOAA weather radio	9	4.8	1,717	5.0	0.6 – 9.4
Commercial radio station	15	8.0	1,627	4.7	1.4 – 8.0
Neighbor/ friend/ family/ word of mouth	2	1.1	593	1.7	0 – 4.2
Other	2	1.1	559	1.6	0 – 4.0

TABLE 3. Concerns after hearing Extreme Cold Warning and actions taken in extreme cold events among residents in Burleigh County, ND, in the CASPER survey conducted on 10–11 Apr 2012.

	Frequency (<i>n</i> = 188)	Households (%)	Projected number of households	Weighted % (95% CI)
Concerns after hearing EC warning				
No concern ^z	13	6.9	2,913	8.5 (3.8–13.2)
1–3 concerns ^z	82	43.6	14,811	43.1 (33.2–53.0)
4–6 concerns ^z	87	46.3	15,223	44.3 (33.8–54.8)
7 or more concerns ^z	6	3.2	1,424	4.1 (0.6–7.7)
Loss of power	137	72.9	24,415	71.0 (63.8–78.3)
Health issues	116	61.7	20,923	60.9 (52.7–69.1)
Automobile not starting	114	60.6	20,886	60.8 (49.9–71.6)
School/business closing	95	50.5	17,360	50.5 (39.0–62.0)
Threat to pets and livestock	94	50.0	15,746	45.8 (39.2–52.5)
Damage to exposed pipes	62	33.0	11,369	33.1 (23.2–43.0)
Other*	25	13.3	4,824	14.0 (8.2–19.9)
Actions taken in EC event				
No action ^z	1	0.5	285	0.8 (0–2.5)
1–3 actions ^z	14	7.5	2,667	7.8 (2.7–12.9)
4–6 actions ^z	102	54.3	19,048	55.4 (46.9–63.9)
7 or more actions ^z	71	37.8	12,371	36.0 (28.7–43.3)
Wore extra clothing	173	92.0	31,487	91.6 (86.4–96.8)
Ensure vehicles in working order	168	89.4	30,100	87.6 (80.7–94.5)
Stay indoors	163	86.7	29,713	86.4 (79.9–93.0)
Cancel/adjust activity	144	76.6	26,638	77.5 (70.1–84.9)
Change travel plans	134	71.3	24,568	71.5 (64.2–78.7)
Protect livestock/pets	134	71.3	23,992	69.8 (63.5–76.1)
Alternative forms of home heating	105	55.9	17,619	51.3 (42.5–60.0)
Other actions ^y	51	27.1	9,791	28.5 (20.2–36.8)

EC = Extreme Cold. *Other concerns given included road conditions for commuting (*n* = 11), concerns for family (*n* = 3), sufficient supplies (*n* = 3), and others (*n* = 8).

^y Other actions given included winterized home (*n* = 28), gathered supplies (e.g., food, water, blanket, batteries) (*n* = 16) and other protective actions (*n* = 7).

^z Concerns and actions as listed in the table.

Resources

- **CDC Disaster Epidemiology Webpage**
<http://www.cdc.gov/nceh/hsb/disaster/epidemiology.htm>
- **CDC Winter Weather Emergency Webpage**
<http://emergency.cdc.gov/disasters/winter/index.asp>

Thank You

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

