

Online Data Supplement

Sarcoidosis-related Mortality in the U.S. from 1988-2007

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Methods

The database. The NCHS annually compiles data from all death certificates in the U.S. and releases the figures in yearly public-use files—each containing over two million records (one for each decedent). A record contains decedent demographics, multiple cause-of-death (MCO) codes (which identify up to 20 conditions related to death), and the ultimate underlying cause-of-death (UCD).(1) For this study, we analyzed files from 1988-2007. From 1988 to 1998, we captured all decedents with sarcoidosis ICD-9 code 135. Because of the change in coding from ICD-9 to -10, from 1999 to 2007, we captured all decedents with sarcoidosis ICD-10 code D86 (including D86.0-D86.9). Data from more recent years have yet to be compiled by the NCHS. A substantial lack of state reporting race/ethnicity data for 1988 precluded our analysis of race/ethnicity-specific mortality for that year, so for certain analyses, the earliest year available was 1989.

From 1988-1998, the NCHS coded conditions related to death with the Ninth Revision of the International Classification of Diseases (ICD-9),(2) but, in 1998, it stopped coding with the ICD-9 and began using the Tenth Revision of the ICD (ICD-10).(3) For each record, the NCHS codes MCO data in two axes: 1) the entity axis, and 2) the record axis. The entity axis contains the cause(s)-of-death as listed by the death certifier and maintains the order as written on the death certificate. The NCHS derives the record axis code by applying a computerized algorithm called Translation of Axis (TRANSAX) to the entity axis code. Applying this algorithm minimizes repetition and inconsistencies within the entity axis data to produce the more standardized record axis. We used the

record axis code for this study which ultimately includes up to 20 associated causes of death, including the underlying cause of death (see below). National MCOB data quality is maintained by records review at the state and national level.

The NCHS uses another computerized system, called the Automated Classification of Medical Entities (ACME), to code the UCD by applying ICD modification rules to the record axis codes generated by TRANSAX.(4) The World Health Organization (WHO) defines the UCD as “the disease or injury which initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury,”(3, 5) and that is the definition we employed here.

The UCD. From 1988 to 1998, UCD diagnostic codes examined included: ischemic heart disease (ICD-9 codes 410 through 414.9 and 429.2), heart failure (ICD-9 codes 428 through 428.9), cardiomyopathy (ICD-9 codes 402.9 and 425); cardiac dysrhythmia/sudden cardiac death (ICD-9 codes 427); chronic obstructive pulmonary disease (ICD-9 codes 490-496); pulmonary fibrosis (ICD-9 codes 515 and 516.3); pulmonary hypertension (ICD-9 codes 416.0, 416.8 and 428.9); lung cancer (ICD-9 codes 162 through 162.9); pneumonia (ICD-9 codes 480 through 487.8); and liver cancer/non-viral/non-alcoholic cirrhosis (ICD-9 codes 155 and 571) and cerebrovascular disease (ICD-9 codes 430 through 438).

After 1998, diagnostic codes included the following: ischemic heart disease (ICD-10 codes I20 through I25), heart failure (ICD-10 codes I50 through I50.), cardiomyopathy (ICD-9 codes 402.9 and 425); cardiac dysrhythmia/sudden cardiac death (ICD-10 codes I46-I49); chronic obstructive pulmonary disease (ICD-10 codes J40-J44); pulmonary fibrosis (ICD-10 code J84.1); pulmonary hypertension (ICD-10 codes I27.0 and I27.2);

lung cancer (ICD-10 codes C34 through C34.9); pneumonia (ICD-10 code J09 through J18.9); and liver cancer/non-viral/non-alcoholic cirrhosis (ICD-10 codes C22, K72, K73, and K74) and cerebrovascular disease (ICD-10 codes I60 through I69.8).

State-level data. For the state-level analyses, we used mortality data from 2000-2007 to determine standardized (also to the 2000 U.S. Census population), age-adjusted mortality rates for each of non-Hispanic blacks, non-Hispanic whites, and Hispanics for each of the 50 states.

All national-level data are of public record, but state-level data from 2005-2007 were obtained from, and after approval of a submitted proposal by, the National Association for Public Health Statistics and Information Systems.

Figure E1 Legend: Gender-specific Mortality Rates in Hispanics per 1,000,000 Gender

Figure E2 Legend: Age-group-specific Mortality Rates in Non-Hispanic Females or Males per 1,000,000 Gender

References

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4. Isreal R. Automation of mortality data coding and processing in the united states of america. *World Health Stat Q* 1990;43:259-262.
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Table E1. Mortality rates for each year according to gender and age.

Males												
White							Black					
	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	75-84yrs	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	75-84yrs
1989	0.50	1.13	2.36	3.11	5.02	9.02	13.44	25.45	36.74	30.38	13.41	14.81
1990	0.38	0.75	3.12	3.02	5.69	5.75	9.72	26.79	34.27	30.44	13.24	14.63
1991	0.19	1.19	1.68	3.64	6.22	5.58	11.72	31.89	46.54	40.80	32.46	21.73
1992	0.33	1.12	2.04	3.18	6.75	5.71	9.72	31.09	36.09	37.16	31.87	14.31
1993	0.33	1.23	1.78	3.19	6.69	8.07	10.18	29.08	42.41	31.05	28.14	31.78
1994	0.20	1.08	2.05	2.70	4.68	7.06	10.68	34.00	35.90	43.29	35.49	17.30
1995	0.21	1.44	2.56	3.79	6.80	9.77	12.82	33.06	50.58	42.72	22.88	20.26
1996	0.43	1.11	2.47	4.74	5.27	9.19	14.47	29.72	39.95	45.59	22.63	23.07
1997	0.22	1.17	1.93	3.57	5.33	7.69	10.38	26.93	34.89	46.71	29.93	22.51
1998	0.45	1.10	2.87	3.89	7.13	8.26	8.38	27.17	43.28	47.64	26.69	25.16
1999	0.62	1.29	2.05	3.78	5.30	9.76	10.59	26.32	41.18	36.04	29.35	24.77
2000	0.63	0.75	3.16	4.62	7.00	11.57	11.57	23.62	46.99	38.89	36.15	15.43
2001	0.32	1.02	2.59	5.15	7.33	9.06	7.49	24.31	34.33	48.37	35.62	32.96
2002	0.48	1.49	2.98	5.63	5.89	8.70	7.89	32.63	48.81	50.68	46.91	32.08
2003	0.33	1.33	2.14	4.07	7.66	9.50	7.88	33.70	49.72	48.40	36.09	45.59
2004	0.33	1.52	3.42	5.11	6.92	9.27	8.29	26.65	47.35	53.50	47.64	34.19
2005	0.74	1.33	3.08	6.05	7.95	10.40	7.46	27.43	44.04	60.29	49.08	28.50
2006	1.15	1.66	2.75	5.39	7.21	11.99	5.39	28.61	44.98	63.69	36.09	42.74
2007	0.74	1.79	2.95	6.14	8.69	13.80	7.88	21.16	43.56	51.80	57.75	37.04
Females												
White							Black					
	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	75-84yrs	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	75-84yrs
1989	0.25	0.42	1.70	5.10	8.36	9.42	11.15	34.45	45.17	40.87	49.03	14.66
1990	0.19	0.48	1.96	4.73	7.71	9.78	13.26	33.75	63.95	46.18	34.58	20.49
1991	0.06	0.66	1.83	5.34	8.03	7.65	11.80	35.93	54.75	58.54	31.85	30.41
1992	0.26	0.72	1.63	4.39	9.49	10.16	12.22	44.09	65.02	70.71	51.70	18.03
1993	0.27	0.91	2.52	3.52	8.21	10.72	14.10	31.09	63.49	55.81	56.58	29.78
1994	0.34	0.96	2.59	4.43	9.84	12.30	9.86	34.44	61.06	59.47	61.59	27.46
1995	0.14	1.19	1.94	5.57	8.86	11.13	11.77	36.96	72.79	68.90	67.67	42.63
1996	0.14	0.25	2.50	6.33	8.49	13.42	7.73	30.98	69.16	78.98	58.53	42.04
1997	0.00	0.61	2.11	5.56	7.10	14.02	9.27	40.44	64.92	80.39	43.12	31.96
1998	0.30	0.92	3.03	7.29	9.63	12.92	10.10	36.18	65.73	82.26	65.35	29.88
1999	0.31	0.80	1.58	4.27	8.59	11.36	5.31	33.58	56.39	63.38	58.73	40.76
2000	0.08	1.13	3.18	5.67	8.73	14.00	7.46	35.99	75.85	77.87	55.20	52.17
2001	0.49	1.02	2.69	7.74	11.82	14.69	6.40	33.14	87.20	75.45	82.97	38.92
2002	0.25	1.10	3.27	6.17	11.07	16.91	7.53	37.79	67.03	90.67	70.84	59.45
2003	0.33	0.86	2.57	6.19	9.86	17.50	7.15	37.00	63.77	94.82	86.41	42.01
2004	0.00	0.60	2.11	6.82	13.01	15.19	6.40	25.94	64.58	92.77	64.81	54.94
2005	0.17	1.19	2.70	5.65	12.64	16.11	5.27	26.63	70.68	99.59	85.39	46.86
2006	0.08	0.73	3.16	7.45	13.90	19.18	4.14	23.86	67.02	103.00	106.99	59.78
2007	0.25	1.33	3.10	8.07	10.49	17.96	4.89	20.75	58.90	113.23	102.87	61.40