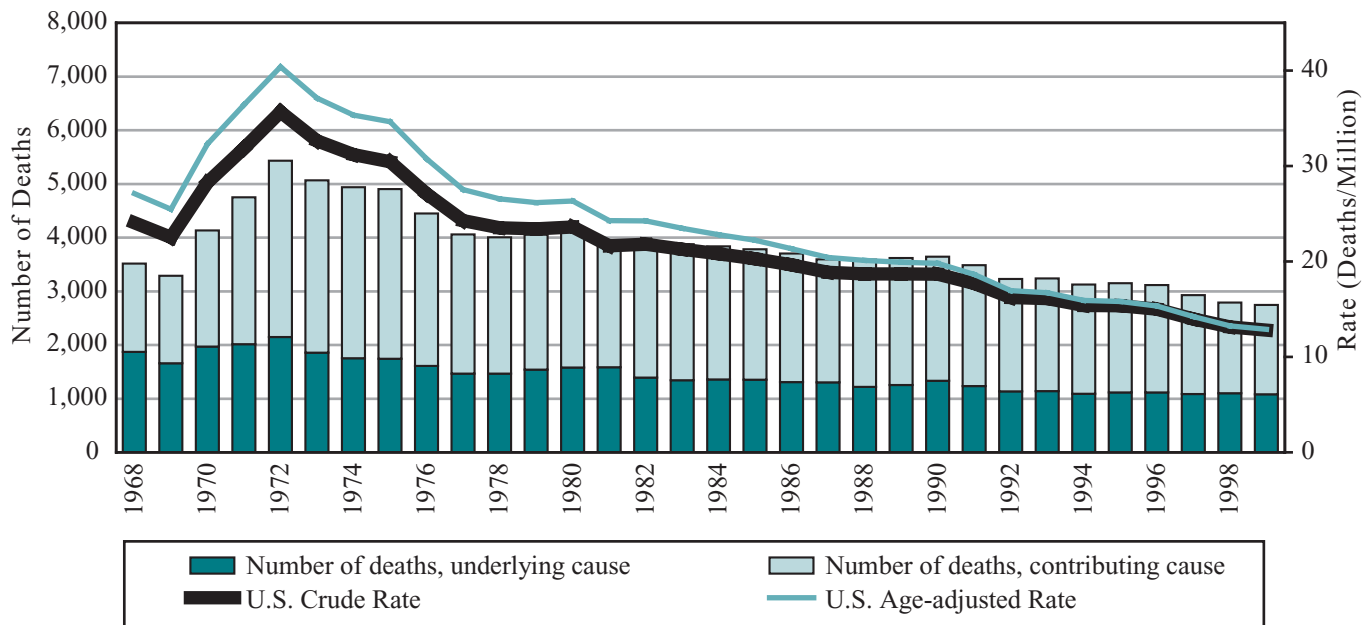

Section 6

All Pneumoconioses and Related Exposures

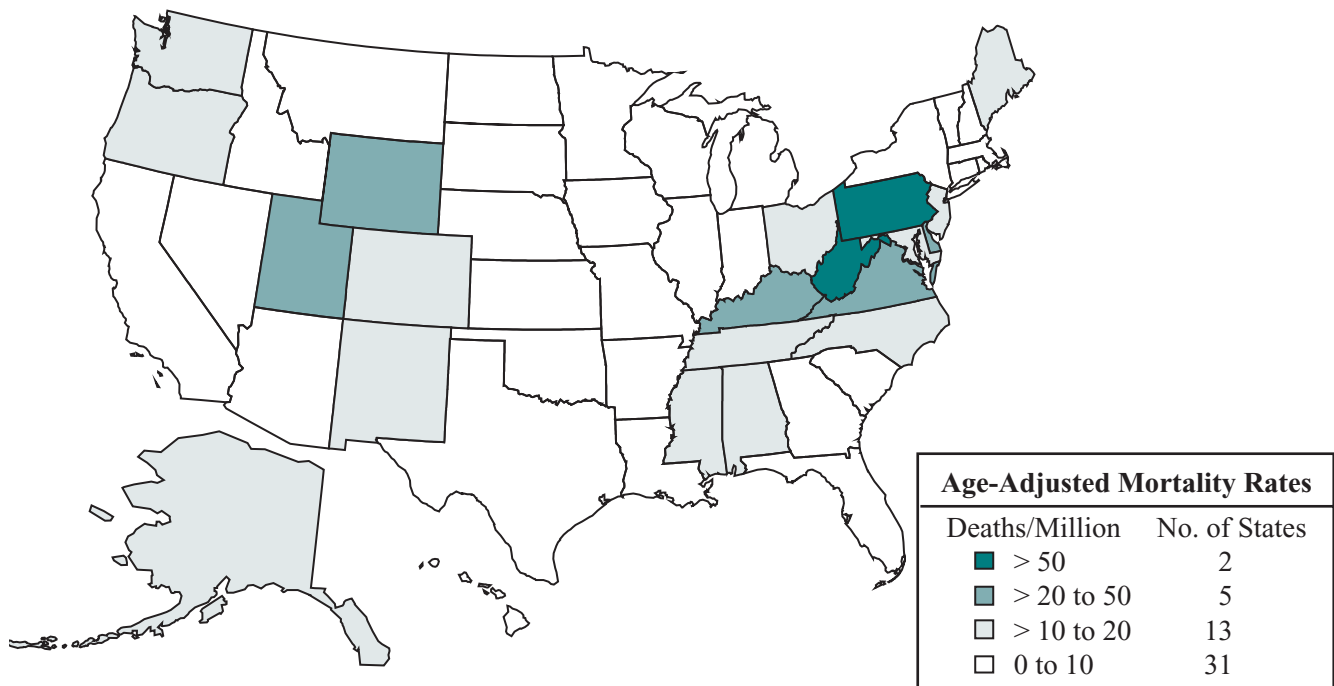
Figure 6-1. All pneumoconioses: Number of deaths, crude and age-adjusted mortality rates, U.S. residents age 15 and over, 1968-1999



NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

Figure 6-2. All pneumoconioses: Age-adjusted mortality rates by state, U.S. residents age 15 and over, 1990-1999



NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

Table 6-1. All pneumoconioses: Number of deaths by sex, race, and age, and median age at death, U.S. residents age 15 and over, 1990-1999

Year	No. of Deaths	Underlying Cause (%)	Sex		Race			Age Group (yrs)								Median Age (yrs)
			Male	Female	White	Black	Other	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	
1990	3,644	36.6	3,557	87	3,407	222	15	-	5	17	66	358	1,162	1,503	533	76.0
1991	3,486	35.5	3,403	83	3,275	202	9	3	4	25	63	283	1,084	1,484	540	76.0
1992	3,230	35.1	3,153	77	3,044	174	12	4	4	12	42	265	989	1,409	505	77.0
1993	3,238	35.3	3,170	68	3,049	173	16	-	4	14	56	277	953	1,410	524	77.0
1994	3,126	34.9	3,052	74	2,963	154	9	-	-	10	45	233	893	1,434	511	77.0
1995	3,151	35.4	3,092	59	2,983	160	8	-	4	10	68	245	913	1,337	574	77.0
1996	3,114	35.8	3,030	84	2,936	164	14	-	1	11	51	210	883	1,364	594	78.0
1997	2,928	37.1	2,851	77	2,780	139	9	-	2	12	48	191	751	1,313	611	78.0
1998	2,790	39.4	2,719	71	2,650	127	13	-	3	11	41	189	733	1,225	588	78.0
1999	2,745	39.5	2,683	62	2,592	136	17	-	1	9	38	177	683	1,210	627	78.0
TOTAL	31,452	36.4	30,710	742	29,679	1,651	122	7	28	131	518	2,428	9,044	13,689	5,607	77.0

- indicates no deaths listed.

NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data.

Table 6-2. All pneumoconioses: Mortality rates (per million population) by race and sex, U.S. residents age 15 and over, 1990-1999

Year	Overall	White		Black		Other	
		Male	Female	Male	Female	Male	Female
Crude Mortality Rate							
1990	18.66	41.52	0.92	21.03	0.50	3.74	0.54
1991	17.69	39.59	0.92	19.02	0.33	2.49	–
1992	16.22	36.53	0.78	15.66	0.65	2.92	0.25
1993	16.11	36.36	0.72	15.57	0.40	4.15	–
1994	15.40	34.94	0.79	13.68	0.31	2.27	–
1995	15.37	35.03	0.64	14.17	0.15	1.96	–
1996	15.00	33.75	0.91	14.26	0.15	3.02	0.21
1997	13.96	31.74	0.78	11.41	0.52	2.04	–
1998	13.15	30.11	0.68	10.36	0.37	1.96	0.79
1999	12.81	29.21	0.65	11.19	0.14	3.61	–
1990-1999	15.34	34.71	0.78	14.40	0.35	2.80	0.18
Age-Adjusted Mortality Rate							
1990	19.81	53.28	0.77	38.57	0.58	9.71	1.06
1991	18.65	50.44	0.80	36.33	0.40	4.49	–
1992	16.95	46.05	0.66	29.67	0.78	6.23	0.55
1993	16.73	45.21	0.60	29.67	0.52	9.18	–
1994	15.92	43.17	0.65	25.77	0.38	4.68	–
1995	15.80	42.82	0.53	27.71	0.21	3.67	–
1996	15.33	41.12	0.75	26.01	0.18	6.32	0.42
1997	14.22	38.57	0.64	21.18	0.70	3.82	–
1998	13.26	35.66	0.55	19.28	0.43	3.81	1.25
1999	12.88	34.41	0.52	20.91	0.16	6.27	–
1990-1999	15.76	42.46	0.64	27.08	0.43	5.92	0.34

– indicates no deaths listed.

NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

All Pneumoconioses: Mortality

Table 6-3. All pneumoconioses: Years of potential life lost to age 65 and to life expectancy by race and sex, U.S. residents age 15 and over, 1990-1999

Year	White		Black		Other		Total
	Male	Female	Male	Female	Male	Female	
Years of Potential Life Lost to Age 65							
1990	2,915	35	340	55	35	–	3,380
1991	2,655	245	340	–	20	–	3,260
1992	2,160	100	245	55	15	–	2,575
1993	2,350	45	270	25	25	–	2,715
1994	1,825	55	180	25	5	–	2,090
1995	2,365	40	165	15	50	–	2,635
1996	1,815	115	140	–	55	–	2,125
1997	1,810	105	130	–	–	–	2,045
1998	1,665	60	170	30	10	5	1,940
1999	1,340	60	260	25	30	–	1,715
TOTAL	20,900	860	2,240	230	245	5	24,480
Years of Potential Life Lost to Life Expectancy							
1990	33,353	931	2,139	131	173	22	36,749
1991	32,303	1,199	1,959	49	143	–	35,653
1992	29,270	959	1,616	149	146	9	32,149
1993	29,159	772	1,651	69	209	–	31,860
1994	27,761	810	1,441	66	111	–	30,189
1995	28,815	684	1,440	37	152	–	31,128
1996	27,380	1,004	1,566	28	195	8	30,181
1997	25,884	865	1,305	63	111	–	28,228
1998	24,969	746	1,213	95	112	51	27,186
1999	23,921	673	1,397	51	243	–	26,285
TOTAL	282,815	8,643	15,727	738	1,595	90	309,608

– indicates no deaths listed.

NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data.

Table 6-4. All pneumoconioses: Number of deaths by state, U.S. residents age 15 and over, 1990-1999

State	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Alabama	61	71	49	51	54	57	65	65	62	61	596
Alaska	2	1	2	3	3	-	2	2	5	3	23
Arizona	20	13	13	23	22	28	25	21	16	29	210
Arkansas	14	17	13	17	9	15	14	12	10	16	137
California	151	155	134	142	147	145	127	119	117	128	1,365
Colorado	30	38	35	43	29	30	37	30	26	27	325
Connecticut	17	19	27	17	18	16	22	15	19	17	187
Delaware	10	18	10	11	15	15	12	10	15	23	139
District of Columbia	1	2	1	1	2	2	2	1	-	-	12
Florida	86	102	91	73	88	102	128	95	91	116	972
Georgia	23	18	25	24	20	26	22	23	22	22	225
Hawaii	3	4	4	1	2	5	2	1	1	1	24
Idaho	6	6	6	6	3	6	9	8	6	8	64
Illinois	94	90	91	77	65	72	85	78	68	64	784
Indiana	40	46	31	26	27	31	30	40	38	32	341
Iowa	12	11	19	15	12	18	12	11	16	11	137
Kansas	5	9	10	15	11	19	11	8	7	6	101
Kentucky	169	150	161	142	117	122	154	139	129	134	1,417
Louisiana	30	31	17	30	20	21	25	25	31	25	255
Maine	19	10	8	16	14	8	9	8	16	16	124
Maryland	55	40	48	44	60	68	65	53	60	60	553
Massachusetts	42	34	55	28	49	44	45	48	46	39	430
Michigan	59	42	47	48	39	47	49	41	37	47	456
Minnesota	15	10	26	24	22	24	13	19	19	24	196
Mississippi	21	29	27	21	29	42	35	41	32	35	312
Missouri	24	27	30	30	27	23	15	20	20	20	236
Montana	9	2	7	8	5	5	8	5	8	4	61
Nebraska	3	7	4	6	4	4	3	6	2	7	46
Nevada	6	4	2	10	10	7	6	4	8	9	66
New Hampshire	3	3	6	9	7	7	4	10	6	7	62
New Jersey	144	118	105	92	95	112	121	89	104	102	1,082
New Mexico	15	10	11	13	21	19	11	15	10	10	135
New York	77	61	46	55	64	56	64	59	57	72	611
North Carolina	50	52	54	36	58	65	54	49	67	54	539
North Dakota	2	3	-	2	4	-	4	4	2	5	26
Ohio	167	183	156	129	133	140	141	104	128	122	1,403
Oklahoma	17	16	13	9	12	10	6	14	11	15	123
Oregon	17	27	26	32	28	22	33	22	35	37	279
Pennsylvania	1,206	1,143	1,018	1,050	939	842	856	775	647	574	9,050
Rhode Island	8	1	7	5	6	5	5	7	9	6	59
South Carolina	18	17	21	27	21	22	25	28	30	24	233
South Dakota	2	-	-	-	1	-	4	2	-	2	11
Tennessee	57	42	39	44	49	50	41	42	50	44	458
Texas	108	112	76	93	92	109	109	109	110	101	1,019
Utah	28	18	22	29	29	27	18	30	14	18	233
Vermont	6	2	7	5	1	4	4	5	4	5	43
Virginia	200	179	196	213	178	197	178	181	178	172	1,872
Washington	44	60	48	69	67	48	56	64	68	78	602
West Virginia	420	395	359	345	366	379	324	338	305	282	3,513
Wisconsin	23	27	17	21	18	26	14	25	19	23	213
Wyoming	5	11	10	8	14	9	10	8	9	8	92
TOTAL	3,644	3,486	3,230	3,238	3,126	3,151	3,114	2,928	2,790	2,745	31,452

- indicates no deaths listed.

NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data.

All Pneumoconioses: Mortality

Table 6-5. All pneumoconioses: Number of deaths, mortality rates (per million population), and years of potential life lost (YPLL) by state, U.S. residents age 15 and over, 1990-1999

State	No. of Deaths		Crude Mortality		Age-Adjusted Mortality		YPLL to Life Expectancy			
	Rate	Rank	Rate	Rank	Rate	Rank	Total	Rank	YPLL/death	Rank
Alabama	596	13	17.98	7	17.95	8	6,839	12	11.5	27
Alaska	23	49	5.27	43	14.49	14	287	49	12.5	7
Arizona	210	29	6.47	34	6.53	35	2,352	30	11.2	31
Arkansas	137	33	7.09	32	6.18	38	1,663	32	12.1	18
California	1,365	6	5.59	38	6.69	33	16,647	4	12.2	14
Colorado	325	20	11.22	16	14.34	15	3,367	22	10.4	46
Connecticut	187	31	7.11	31	6.85	32	2,186	31	11.7	23
Delaware	139	32	24.61	6	26.69	6	1,592	33	11.5	27
District of Columbia	12	50	2.59	49	2.76	50	215	50	17.9	1
Florida	972	9	8.47	24	6.43	37	10,928	9	11.2	31
Georgia	225	27	4.05	47	5.07	42	2,818	26	12.5	7
Hawaii	24	48	2.59	49	2.98	49	299	48	12.5	7
Idaho	64	41	7.44	28	7.45	30	696	42	10.9	40
Illinois	784	10	8.51	23	8.68	24	8,775	10	11.2	31
Indiana	341	19	7.56	27	7.62	29	3,775	20	11.1	37
Iowa	137	33	6.19	35	5.00	43	1,473	34	10.7	41
Kansas	101	38	5.11	44	4.68	44	1,302	38	12.9	5
Kentucky	1,417	4	46.96	3	47.30	3	16,462	5	11.6	25
Louisiana	255	23	7.83	26	8.57	26	3,520	21	13.8	3
Maine	124	36	12.71	14	12.01	17	1,376	37	11.1	37
Maryland	553	14	13.90	13	16.89	10	6,729	13	12.2	14
Massachusetts	430	18	8.78	22	8.45	27	4,743	18	11.0	39
Michigan	456	17	6.16	36	6.52	36	5,575	16	12.2	14
Minnesota	196	30	5.54	39	5.53	39	2,448	28	12.5	7
Mississippi	312	21	15.31	11	15.29	13	4,566	19	14.6	2
Missouri	236	24	5.68	37	5.13	40	2,834	24	12.0	20
Montana	61	43	9.18	21	8.73	23	638	44	10.5	43
Nebraska	46	45	3.66	48	3.13	48	467	45	10.2	47
Nevada	66	40	5.49	40	6.88	31	810	40	12.3	13
New Hampshire	62	42	6.90	33	7.65	28	712	41	11.5	27
New Jersey	1,082	7	17.01	9	17.01	9	12,068	8	11.2	31
New Mexico	135	35	10.72	18	12.45	16	1,419	36	10.5	43
New York	611	11	4.23	46	4.25	47	7,183	11	11.8	21
North Carolina	539	15	9.42	19	10.04	20	6,564	14	12.2	14
North Dakota	26	47	5.30	42	4.64	45	322	47	12.4	12
Ohio	1,403	5	16.12	10	16.07	11	15,701	6	11.2	31
Oklahoma	123	37	4.85	45	4.52	46	1,423	35	11.6	25
Oregon	279	22	11.37	15	10.66	19	2,990	23	10.7	41
Pennsylvania	9,050	1	93.76	2	82.40	2	90,030	1	9.9	50
Rhode Island	59	44	7.40	29	6.61	34	690	43	11.7	23
South Carolina	233	25	8.17	25	9.27	22	2,823	25	12.1	18
South Dakota	11	51	2.00	51	1.68	51	149	51	13.5	4
Tennessee	458	16	11.04	17	11.34	18	5,151	17	11.2	31
Texas	1,019	8	7.20	30	8.63	25	12,856	7	12.6	6
Utah	233	25	17.42	8	22.32	7	2,377	29	10.2	47
Vermont	43	46	9.40	20	9.94	21	434	46	10.1	49
Virginia	1,872	3	35.76	4	44.04	4	22,032	3	11.8	21
Washington	602	12	14.31	12	15.45	12	6,323	15	10.5	43
West Virginia	3,513	2	241.51	1	211.31	1	40,366	2	11.5	27
Wisconsin	213	28	5.38	41	5.11	41	2,659	27	12.5	7
Wyoming	92	39	25.69	5	31.08	5	812	39	8.8	51

- indicates no deaths listed.

NOTE: See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

All Pneumoconioses: Mortality

Table 6-6. All pneumoconioses: Percent of deaths by condition and state, U.S. residents age 15 and over, 1990-1999

State	Asbestosis	Silicosis	Coal Workers' Pneumoconiosis	Byssinosis	Unspecified/Other Pneumoconioses
Alabama	53.4	6.5	31.0	0.5	9.1
Alaska	78.3	8.7	13.0	-	-
Arizona	54.8	18.1	19.5	0.5	7.6
Arkansas	45.3	10.9	39.4	0.7	4.4
California	73.3	7.8	14.7	0.6	4.1
Colorado	22.5	27.7	36.3	0.6	13.2
Connecticut	68.4	14.4	9.1	-	8.6
Delaware	78.4	4.3	11.5	-	6.5
District of Columbia	41.7	33.3	8.3	-	16.7
Florida	63.8	6.4	22.9	0.4	7.3
Georgia	55.6	15.6	14.7	4.9	10.2
Hawaii	95.8	-	-	-	4.2
Idaho	62.5	23.4	12.5	-	1.6
Illinois	27.8	9.7	45.7	0.3	17.3
Indiana	18.8	12.3	56.6	0.3	12.6
Iowa	39.4	16.8	35.0	0.7	8.8
Kansas	55.4	10.9	26.7	1.0	5.9
Kentucky	4.6	2.9	72.7	0.1	20.0
Louisiana	76.1	13.7	5.9	0.4	4.3
Maine	89.5	8.1	0.8	-	1.6
Maryland	74.5	4.9	15.6	0.2	5.8
Massachusetts	88.4	6.0	1.6	0.7	3.7
Michigan	43.6	23.0	23.2	0.7	10.5
Minnesota	72.4	24.5	-	1.5	3.1
Mississippi	83.7	4.2	11.2	-	1.3
Missouri	52.5	19.1	18.6	0.4	10.2
Montana	55.7	24.6	13.1	-	6.6
Nebraska	78.3	13.0	4.3	-	4.3
Nevada	63.6	19.7	10.6	-	7.6
New Hampshire	80.6	11.3	3.2	1.6	4.8
New Jersey	84.6	4.9	6.7	-	4.5
New Mexico	23.0	29.6	32.6	-	14.8
New York	66.0	17.2	8.5	0.2	9.2
North Carolina	55.3	15.4	17.3	8.0	5.2
North Dakota	76.9	3.8	11.5	-	7.7
Ohio	24.2	15.9	43.9	0.1	17.0
Oklahoma	45.5	18.7	25.2	1.6	8.9
Oregon	87.5	8.2	3.6	-	1.4
Pennsylvania	10.6	4.7	76.0	-	9.2
Rhode Island	79.7	16.9	3.4	1.7	-
South Carolina	71.7	9.9	12.4	4.7	1.3
South Dakota	36.4	45.5	9.1	-	9.1
Tennessee	24.2	7.0	58.1	-	10.9
Texas	82.2	9.8	5.5	0.4	3.3
Utah	15.5	15.5	48.1	-	21.9
Vermont	37.2	41.9	4.7	2.3	14.0
Virginia	23.9	1.7	64.2	0.2	10.3
Washington	87.4	5.0	6.0	-	2.2
West Virginia	7.3	2.0	74.4	0.1	16.9
Wisconsin	46.5	43.2	5.6	1.4	4.2
Wyoming	20.7	1.1	44.6	-	33.7
TOTAL	34.7	7.6	47.8	0.4	10.1

- indicates no deaths listed.

NOTE: Percentages may total more than 100% due to deaths with multiple pneumoconioses. See appendices for source description, methods, and ICD codes.

SOURCE: National Center for Health Statistics multiple cause of death data.

All Pneumoconioses: Mortality

Table 6-7. All pneumoconioses: Most frequently recorded industries on death certificate, U.S. residents age 15 and over, selected states and years, 1990-1999

CIC	Industry	Number of Deaths	Percent
041	Coal mining	4,623	46.2
060	Construction	1,078	10.8
270	Blast furnaces, steelworks, rolling and finishing mills	203	2.0
360	Ship and boat building and repairing	176	1.8
392	Not specified manufacturing industries	170	1.7
192	Industrial and miscellaneous chemicals	159	1.6
400	Railroads	146	1.5
040	Metal mining	131	1.3
262	Miscellaneous nonmetallic mineral and stone products	127	1.3
901	General government, n.e.c.	105	1.1
	All other industries	2,741	27.4
	Industry not reported	354	3.5
	TOTAL	10,013	100.0

CIC - Census Industry Code

n.e.c. - not elsewhere classified

NOTE: Percentages may not total to 100% due to rounding. See appendices for source description, methods, and ICD codes, industry and occupation codes, and list of selected states and years.

SOURCE: National Center for Health Statistics multiple cause of death data.

Table 6-8. All pneumoconioses: Most frequently recorded occupations on death certificate, U.S. residents age 15 and over, selected states and years, 1990-1999

COC	Occupation	Number of Deaths	Percent
616	Mining machine operators	4,299	42.9
889	Laborers, except construction	389	3.9
585	Plumbers, pipefitters, and steamfitters	257	2.6
019	Managers and administrators, n.e.c.	248	2.5
575	Electricians	220	2.2
567	Carpenters	198	2.0
453	Janitors and cleaners	179	1.8
633	Supervisors, production occupations	167	1.7
804	Truck drivers	163	1.6
869	Construction laborers	142	1.4
	All other occupations	3,397	33.9
	Occupation not reported	354	3.5
	TOTAL	10,013	100.0

COC - Census Occupation Code

n.e.c. - not elsewhere classified

NOTE: Percentages may not total to 100% due to rounding. See appendices for source description, methods, and ICD codes, industry and occupation codes, and list of selected states and years.

SOURCE: National Center for Health Statistics multiple cause of death data.

Table 6-9. All pneumoconioses: Proportionate mortality ratio (PMR) adjusted for age, sex, and race by usual industry, U.S. residents age 15 and over, selected states and years, 1990-1999

CIC	Industry	Number of Deaths	PMR	95% Confidence Interval	
				LCL	UCL
041	Coal mining	4,623	33.13	32.19	34.10
262	Miscellaneous nonmetallic mineral and stone products	127	7.86	6.58	9.39
040	Metal mining	131	5.19	4.36	6.18
360	Ship and boat building and repairing	176	4.48	3.86	5.21
261	Pottery and related products	27	3.81	2.51	5.55
050	Nonmetallic mining and quarrying, except fuel	69	3.58	2.81	4.57
271	Iron and steel foundries	70	2.77	2.18	3.53
361	Railroad locomotives and equipment	7	2.66	1.07	5.48
252	Structural clay products	29	2.62	1.76	3.77
502	Lumber and construction materials	23	2.26	1.43	3.40
192	Industrial and miscellaneous chemicals	159	1.75	1.50	2.05
211	Other rubber products, and plastics footwear and belting	48	1.45	1.07	1.93
250	Glass and glass products	55	1.37	1.04	1.80

CIC - Census Industry Code n.e.c. - not elsewhere classified LCL - lower confidence limit UCL - upper confidence limit
 NOTE: See appendices for source description, methods, and ICD codes, industry and occupation codes, and list of selected states and years.
 SOURCE: National Center for Health Statistics multiple cause of death data.

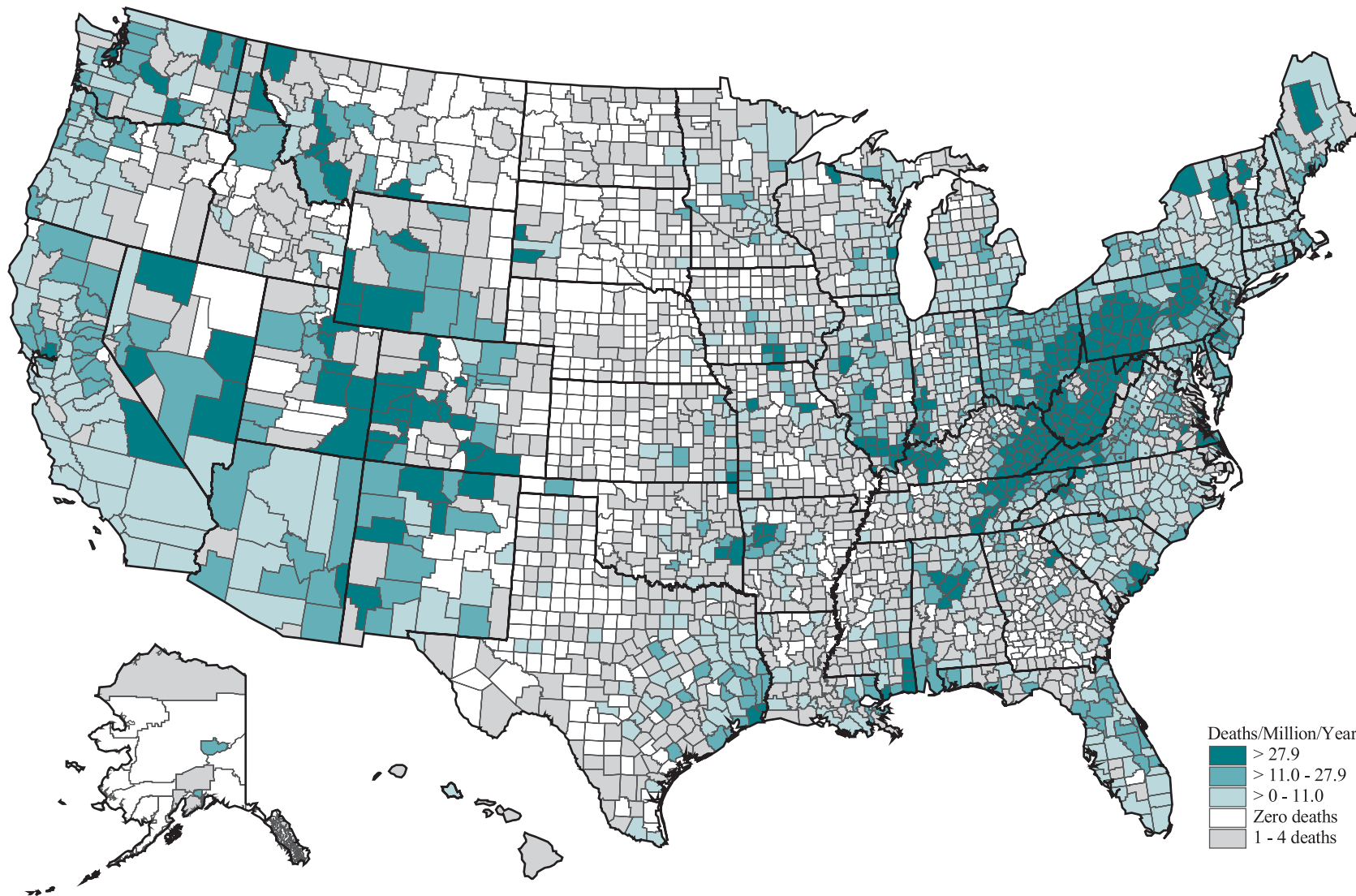
All Pneumoconioses: Mortality

Table 6-10. All pneumoconioses: Proportionate mortality ratio (PMR) adjusted for age, sex, and race by usual occupation, U.S. residents age 15 and over, selected states and years, 1990-1999

COC	Occupation	Number of Deaths	PMR	95% Confidence Interval	
				LCL	UCL
616	Mining machine operators	4,299	32.79	31.82	33.79
593	Insulation workers	109	25.52	21.07	30.94
613	Supervisors, extractive occupations	73	10.74	8.49	13.61
725	Miscellaneous metal and plastic processing machine operators	11	10.47	5.23	18.72
046	Mining engineers	16	6.11	3.49	9.93
643	Boilermakers	61	5.91	4.57	7.67
615	Explosives workers	6	5.03	1.84	10.96
787	Hand molding, casting, and forming occupations	10	4.58	2.20	8.42
768	Crushing and grinding machine operators	26	4.51	2.95	6.61
617	Mining occupations, n.e.c.	26	4.16	2.72	6.11
675	Hand molders and shapers, except jewelers	16	3.67	2.10	5.95
585	Plumbers, pipefitters, and steamfitters	257	2.89	2.55	3.27
719	Molding and casting machine operators	38	2.70	1.92	3.71
843	Supervisors, material moving equipment operators	9	2.39	1.10	4.53
859	Miscellaneous material moving equipment operators	23	2.17	1.37	3.26
584	Plasterers	11	2.12	1.06	3.80
575	Electricians	220	2.07	1.81	2.37
653	Sheet metal workers	58	1.95	1.50	2.54
544	Millwrights	52	1.81	1.37	2.39
824	Locomotive operating occupations	36	1.63	1.14	2.25
783	Welders and cutters	139	1.58	1.34	1.87

COC - Census Occupation Code n.e.c. - not elsewhere classified LCL - lower confidence limit UCL - upper confidence limit
 NOTE: See appendices for source description, methods, and ICD codes, industry and occupation codes, and list of selected states and years.
 SOURCE: National Center for Health Statistics multiple cause of death data.

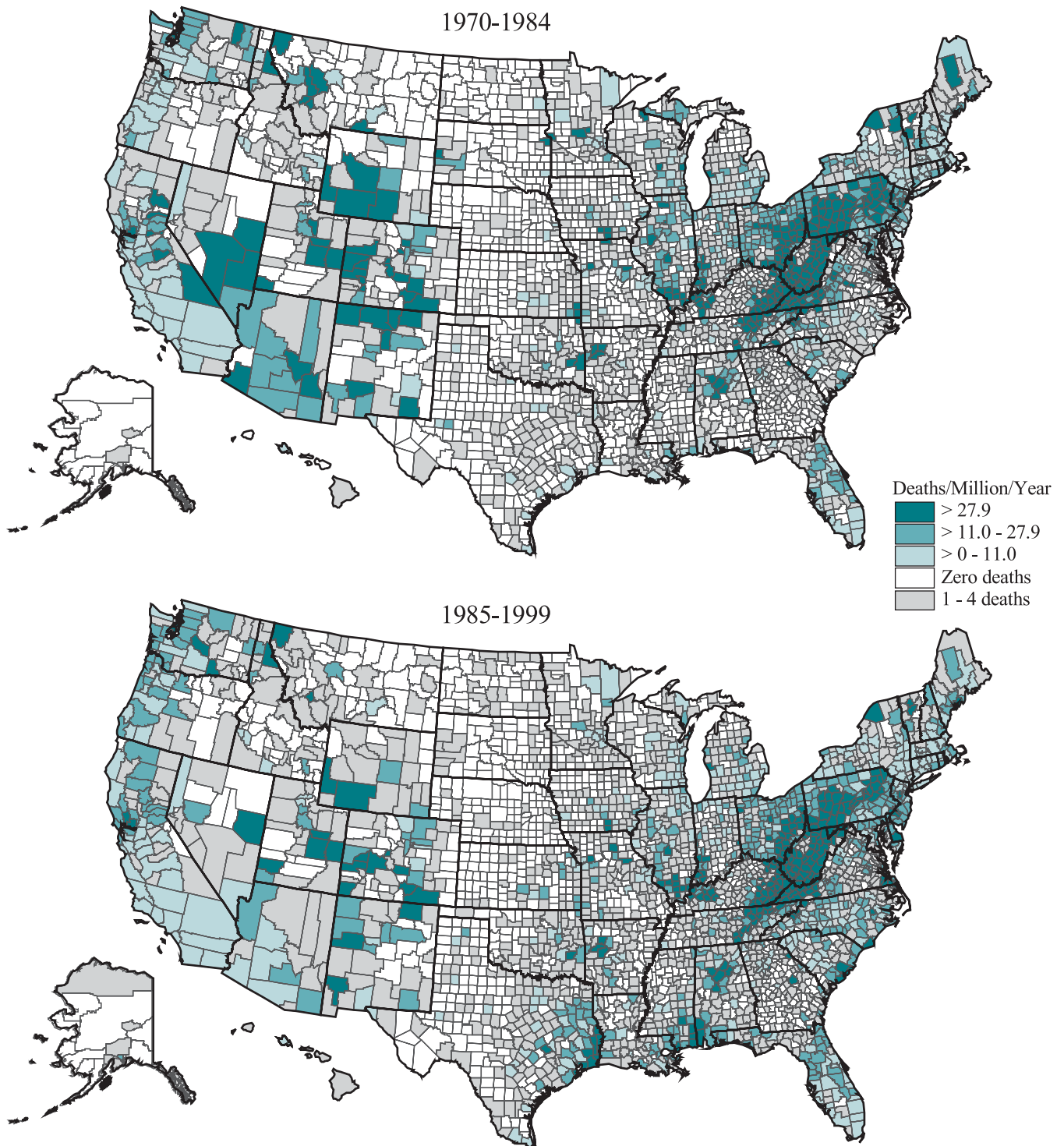
Figure 6-3. All pneumoconioses: Age-adjusted mortality rates by county, U.S. residents age 15 and over, 1970-1999



NOTE: Age-adjusted rates are not calculated for those counties with 1-4 deaths. See appendices for source description, methods, and ICD codes.
SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

All Pneumoconioses: Mortality

Figure 6-4. All pneumoconioses: Age-adjusted mortality rates by county, U.S. residents age 15 and over, 1970-1984 and 1985-1999



NOTE: Age-adjusted rates are not calculated for those counties with 1-4 deaths. See appendices for source description, methods, and ICD codes.
SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

Table 6-11. All pneumoconioses: Counties with highest age-adjusted mortality rates (per million population), U.S. residents age 15 and over, 1985-1999

County	State	Age-Adjusted Rate	Crude Rate	Number of Deaths	% Female
Buchanan County	Virginia	1,732.5	1,227.6	451	0.2
Raleigh County	West Virginia	1,128.7	1,281.6	1,169	0.0
McDowell County	West Virginia	1,127.8	1,264.3	495	0.2
Schuylkill County	Pennsylvania	1,100.9	1,535.8	2,898	0.2
Wyoming County	West Virginia	1,067.5	903.5	303	0.0
Floyd County	Kentucky	961.3	864.9	434	0.0
Dickenson County	Virginia	884.3	853.2	177	0.6
Wise County	Virginia	864.1	868.3	406	0.2
Tazewell County	Virginia	846.9	869.4	485	0.4
Norton City	Virginia	841.7	814.7	41	0.0
Boone County	West Virginia	774.8	734.3	228	0.4
Luzerne County	Pennsylvania	684.1	960.7	3,896	0.4
Fayette County	West Virginia	669.8	847.3	485	0.2
Logan County	West Virginia	658.1	635.9	317	0.3
Harlan County	Kentucky	648.7	642.4	267	0.0
Carbon County	Utah	595.2	644.1	139	0.0
Letcher County	Kentucky	590.7	553.9	171	1.2
Russell County	Virginia	548.2	514.7	177	0.0
Cambria County	Pennsylvania	494.1	653.2	1,285	0.2
Northumberland County	Pennsylvania	478.7	669.0	777	0.3
Mingo County	West Virginia	478.5	397.1	149	0.0
Bell County	Kentucky	436.8	436.8	157	0.0
Somerset County	Pennsylvania	426.9	522.4	488	0.2
Webster County	West Virginia	402.3	482.9	59	0.0
Knott County	Kentucky	401.9	323.8	67	0.0
Lee County	Virginia	393.6	462.0	133	0.8
Nicholas County	West Virginia	391.3	421.6	132	0.8
Carbon County	Pennsylvania	386.5	508.4	358	0.6
Mercer County	West Virginia	352.1	432.5	339	0.3
Fayette County	Pennsylvania	348.2	443.0	776	0.0
Franklin County	Illinois	343.7	503.3	243	0.0
Emery County	Utah	339.0	267.7	26	0.0
Lackawanna County	Pennsylvania	336.4	470.5	1,255	0.2
Muhlenberg County	Kentucky	327.6	374.2	138	0.0
Pike County	Kentucky	318.3	263.6	223	0.4
Johnson County	Kentucky	306.1	259.2	71	0.0
Leslie County	Kentucky	302.9	240.6	37	0.0
Sweetwater County	Wyoming	277.0	158.0	68	0.0
Greene County	Pennsylvania	274.6	343.1	161	0.0
Knox County	Kentucky	265.5	270.0	94	1.1
Indiana County	Pennsylvania	249.8	250.8	273	0.0
Clay County	West Virginia	239.0	256.9	29	3.4
Martin County	Kentucky	231.7	177.6	25	0.0
Preston County	West Virginia	229.0	251.8	86	0.0
Las Animas County	Colorado	227.0	365.6	59	1.7
Perry County	Kentucky	223.4	188.9	67	0.0
Campbell County	Tennessee	220.5	236.8	100	1.0
Greenbrier County	West Virginia	216.3	275.0	117	0.0
Marion County	West Virginia	213.6	284.4	200	0.5
Whitley County	Kentucky	210.7	212.4	84	0.0
Overall United States		17.4	16.7	49,740	2.2

NOTE: Only counties with at least 5 deaths from the disease of interest are included. See appendices for source description, methods, and ICD codes.
 SOURCE: National Center for Health Statistics multiple cause of death data. Population estimates from U.S. Bureau of the Census.

All Pneumoconioses: Morbidity

Table 6-12. Occupational dust diseases of the lungs: Estimated number of cases reported by employers, by industry division, U.S. private sector, 1973-2000

Year	Agriculture	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale & Retail Trade	Finance	Services	Total
1973	100	-	100	700	200	200	-	100	1,500
1974	100	300	100	900	-	300	-	100	1,700
1975	-	-	200	600	-	100	-	-	1,000
1976	-	-	200	800	100	-	-	-	1,200
1977	100	200	800	700	100	100	100	100	2,000
1978	-	300	200	800	100	200	-	100	1,600
1979	-	300	200	900	100	100	-	100	1,700
1980	-	300	200	1,300	100	100	-	200	2,300
1981	-	300	200	1,500	-	-	-	100	2,100
1982	-	300	100	1,200	100	100	-	100	2,000
1983	-	200	100	900	-	200	-	200	1,700
1984	-	200	200	1,000	100	100	-	100	1,800
1985	-	200	100	800	100	200	-	200	1,700
1986	100	600	100	-	-	-	100	300	3,200
1987	-	900	500	1,200	200	-	-	400	3,400
1988	-	700	200	1,200	300	-	-	300	2,900
1989	-	500	200	1,300	100	100	-	200	2,600
1990	100	300	300	1,600	400	100	-	300	3,000
1991	100	500	200	1,000	200	-	-	300	2,500
1992	-	600	100	1,000	-	200	-	500	2,600
1993	100	600	200	900	300	-	-	600	2,700
1994	-	400	200	900	300	300	-	500	2,700
1995	-	200	100	700	200	200	-	1,100	2,700
1996	-	100	100	2,600	200	100	-	400	3,500
1997	-	100	300	900	300	200	300	800	2,900
1998	-	300	200	800	300	200	-	400	2,100
1999	-	100	100	900	300	100	100	500	2,200
2000	-	100	100	500	200	300	100	400	1,700

- indicates data do not meet BLS publication guidelines.

NOTE: Dust diseases of the lungs (pneumoconioses) include silicosis, asbestosis, coal workers' pneumoconiosis, byssinosis, siderosis, and other pneumoconioses. The sum of industry divisions may not equal the total due to rounding. See appendices for source description.

SOURCE: Bureau of Labor Statistics annual reports of occupational injuries and illnesses.

Table 6-13. Occupational dust diseases of the lungs: Estimated rate (based on cases reported by employers, per 10,000 full-time workers) by industry division, U.S. private sector, 1973-2000

Year	Agriculture	Mining	Construction	Manufacturing	Transportation & Public Utilities	Wholesale & Retail Trade	Finance	Services	Overall
1973	1.3	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.3
1974	0.8	4.8	0.3	0.4	-	0.2	0.0	0.1	0.3
1975	0.4	0.2	0.6	0.4	0.1	-	-	-	0.2
1976	0.2	0.1	0.5	0.4	0.2	-	-	-	0.2
1977	1.3	2.0	2.5	0.4	0.1	-	0.1	0.1	0.3
1978	0.3	4.0	0.6	0.4	0.1	0.1	-	-	0.3
1979	0.1	3.4	0.5	0.4	0.1	0.1	-	0.1	0.3
1980	0.4	3.3	0.6	0.7	0.1	0.1	-	0.1	0.4
1981	0.3	2.5	0.5	0.8	0.1	-	-	0.1	0.3
1982	0.4	3.2	0.3	0.7	0.2	0.1	-	0.1	0.3
1983	0.4	1.9	0.4	0.5	0.1	0.1	-	0.1	0.3
1984	0.4	1.7	0.5	0.5	0.2	0.1	-	0.1	0.3
1985	0.5	2.7	0.3	0.4	0.2	0.1	-	0.1	0.2
1986	1.0	8.4	0.3	0.9	-	-	-	0.1	0.5
1987	0.5	12.9	1.2	0.6	0.3	-	-	0.2	0.5
1988	-	10.2	0.5	0.6	0.6	-	-	0.1	0.4
1989	0.2	7.5	0.5	0.7	0.2	-	-	0.1	0.3
1990	0.6	4.4	0.6	0.9	0.7	-	-	0.1	0.4
1991	0.5	7.3	0.4	0.5	0.3	-	-	0.1	0.3
1992	0.2	9.0	0.3	0.6	-	0.1	-	0.2	0.3
1993	0.5	8.7	0.4	0.5	0.5	-	-	0.3	0.3
1994	0.3	6.6	0.5	0.5	0.5	0.1	0.1	0.2	0.3
1995	0.1	3.4	0.3	0.4	0.4	0.1	0.1	0.5	0.3
1996	0.1	1.6	0.1	1.4	0.3	-	0.1	0.2	0.4
1997	0.3	1.7	0.5	0.5	0.5	0.1	0.5	0.3	0.3
1998	0.2	4.3	0.3	0.4	0.4	0.1	0.1	0.2	0.2
1999	0.2	2.2	0.1	0.5	0.5	0.1	0.1	0.2	0.2
2000	0.2	1.7	0.1	0.3	0.3	0.1	0.1	0.2	0.2

- indicates no data reported or data that do not meet BLS publication guidelines.

NOTE: Dust diseases of the lungs (pneumoconioses) include silicosis, asbestosis, coal workers' pneumoconiosis, byssinosis, siderosis, and other pneumoconioses. See appendices for source description.

SOURCE: Bureau of Labor Statistics annual reports of occupational injuries and illnesses.

All Pneumoconioses: Morbidity

Table 6-14 (page 1 of 2). Occupational dust diseases of the lungs: Industries with highest estimated incidence rates (based on cases reported by employers, per 10,000 full-time workers) by industry division, U.S. private sector, 1996-2000

Year/Industry	SIC	Estimated Number of Cases	Rate (per 10,000 full-time workers)
1996			
Coal mining	12	100	8.6
Primary metal industries	33	200	2.2
Local and interurban passenger transit	41	100	1.7
Chemical and allied products	28	100	1.1
Transportation equipment	37	200	1.0
Electric, gas, and sanitary services	49	100	0.9
Lumber and wood products	24	100	0.9
Nonmetallic minerals, except fuels	14	-	0.9
Stone, clay, and glass products	32	-	0.9
Transportation by air	45	100	0.6
ALL INDUSTRIES		3,500	0.4
1997			
Coal mining	12	100	9.5
Fishing, hunting, and trapping	09	-	7.8
Local and interurban passenger transit	41	100	3.7
Primary metal products	33	100	1.8
Insurance carriers	63	200	1.4
Metal mining	10	-	0.9
Nonmetallic minerals, except fuels	14	-	0.9
General building contractors	15	100	0.9
Fabricated metal products	34	100	0.9
Electric, gas, and sanitary services	49	100	0.9
ALL INDUSTRIES		2,900	0.3
1998			
Coal mining	12	200	25.3
Museums, botanical, zoological gardens	84	-	4.7
Nonmetallic minerals, except fuels	14	-	2.3
Electric, gas, and sanitary services	49	200	2.3
Primary metal industries	33	100	2.0
Transportation equipment	37	300	1.4
Agricultural production livestock	02	-	0.9
Local and interurban passenger transit	41	-	0.9
Stone, clay, and glass products	32	-	0.8
Leather and leather products	31	-	0.8
ALL INDUSTRIES		2,100	0.2

See footnotes at end of table.

Table 6-14 (page 2 of 2). Occupational dust diseases of the lungs: Industries with highest estimated incidence rates (based on cases reported by employers, per 10,000 full-time workers) by industry division, U.S. private sector, 1996-2000

Year/Industry	SIC	Estimated Number of Cases	Rate (per 10,000 full- time workers)
1999			
Coal mining	12	100	13.0
Primary metal industries	33	200	3.2
Water transportation	44	-	1.9
Electric, gas, and sanitary services	49	100	1.7
Chemicals and allied products	28	200	1.7
Legal services	81	200	1.7
Leather and leather products	31	-	1.2
Transportation equipment	37	200	1.0
Textile mill products	22	-	0.7
Trucking and warehousing	42	100	0.7
ALL INDUSTRIES		2,200	0.2
2000			
Coal mining	12	100	10.4
Forestry	08	-	10.2
Metal mining	10	-	1.2
Tobacco products	21	-	1.2
Water transportation	44	-	1.2
Nonmetallic minerals, except fuels	14	-	0.9
Electric, gas, and sanitary services	49	100	0.8
Primary metal industries	33	-	0.6
Transportation equipment	37	100	0.5
Petroleum and coal products	29	-	0.5
ALL INDUSTRIES		1,700	0.2

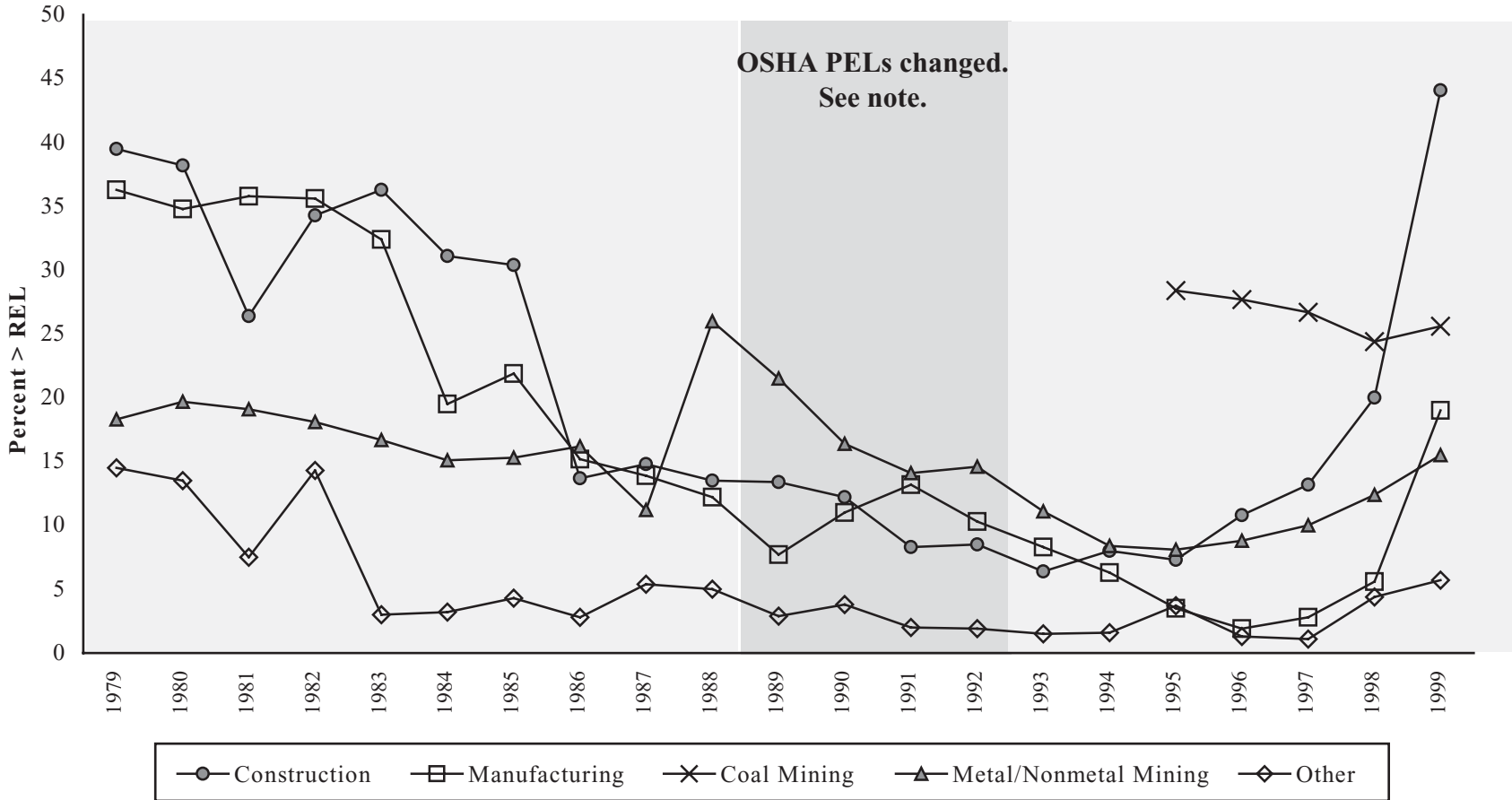
- indicates no data reported or data that do not meet BLS publication guidelines.

SIC - 1987 Standard Industrial Classification

NOTE: Dust diseases of the lungs (pneumoconioses) include silicosis, asbestosis, coal workers' pneumoconiosis, byssinosis, siderosis, and other pneumoconioses. See appendices for source description.

SOURCE: Bureau of Labor Statistics annual reports of occupational injuries and illnesses.

Figure 6-5. Pneumoconiotic agents: Percent of exposures exceeding the NIOSH recommended exposure limits by major industry division, MSHA inspector and mine operator and OSHA samples, 1979-1999



REL - recommended exposure limit

NOTE: From March 1, 1989 to March 22, 1993, the OSHA PELs in force differed from those employed before and after those dates. The NIOSH REL for respirable coal mine dust of 1.0 mg/m³ was adopted in September 1995. The MSHA respirable coal mine quartz exposure data and the NIOSH REL for respirable quartz cannot be compared to each other because they are based on different sampling criteria. See appendices for source description, methods, and agents.

SOURCE: Mine Safety and Health Administration (MSHA) metal/nonmetal mine and coal mine inspector and mine operator dust and quartz data. Occupational Safety and Health Administration (OSHA) Integrated Management Information System.

Table 6-15a. Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by type of mine, MSHA inspector and mine operator samples, 1979-1999

Major Industry	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Coal Mining SIC 11, 12																					
No. of samples with PEL	207,430	254,581	77,764	136,332	136,373	139,050	129,333	120,662	113,050	109,431	103,978	102,213	94,824	91,070	84,346	82,462	78,496	73,001	80,096	89,895	98,876
% > PEL	17.0	15.4	11.0	11.1	10.4	10.6	9.8	10.8	11.0	10.3	9.8	9.1	12.4	11.8	11.2	11.0	11.3	10.1	9.9	9.5	9.0
No. of samples with REL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21,625	66,669	71,536	79,282	86,086
% > REL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28.4	27.7	26.7	24.4	25.6
Metal/Nonmetal Mining SIC 10, 14																					
No. of samples with PEL	9,953	6,988	7,474	3,153	7,075	8,008	6,996	7,279	6,761	7,722	8,990	11,304	13,100	12,707	11,038	17,199	13,611	19,207	8,636	4,889	5,382
% > PEL	11.5	10.7	11.0	10.5	12.0	11.6	12.4	10.9	8.9	17.7	14.9	11.1	9.4	9.0	7.1	5.4	5.2	5.4	6.1	6.5	7.8
No. of samples with REL	9,411	6,513	6,826	2,741	6,418	7,473	6,406	6,898	6,369	7,333	8,629	10,899	12,791	12,473	10,660	16,526	13,034	17,255	8,164	4,728	5,107
% > REL	18.3	19.6	19.0	18.1	16.7	15.1	15.2	16.2	11.2	25.9	21.5	16.4	14.1	14.5	11.1	8.4	8.1	8.8	10.0	12.4	15.5

- indicates incalculable field

PEL - permissible exposure limit REL - recommended exposure limit SIC - Standard Industrial Classification

NOTE: The NIOSH REL for respirable coal mine dust of 1.0 mg/m³ was adopted in September 1995. The MSHA respirable coal mine quartz exposure data and the NIOSH REL for respirable quartz cannot be compared to each other because they are based on different sampling criteria. See appendices for source description, methods, and agents.

SOURCE: Mine Safety and Health Administration (MSHA) metal/nonmetal mine data and coal mine inspector and mine operator dust and quartz data.

Table 6-15b. Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by major industry division, OSHA samples, 1979-1999

Major Industry												OSHA PELs changed. See note.									
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Construction SIC 15-17																					
No. of samples with PEL	132	309	194	218	599	796	658	435	396	435	405	523	526	655	521	296	195	433	498	368	294
% > PEL	11.4	16.2	6.2	11.0	7.0	7.4	9.1	5.1	8.3	9.2	10.9	8.6	7.2	5.5	4.8	7.1	10.8	13.2	8.4	22.8	29.6
No. of samples with REL	124	262	144	204	498	731	596	357	337	363	328	362	374	472	359	250	165	334	395	454	238
% > REL	39.5	38.2	26.4	34.3	36.3	31.1	30.4	13.7	14.8	13.5	13.4	12.2	8.3	8.5	6.4	7.6	7.3	10.8	12.9	19.8	43.3
Manufacturing SIC 20-39																					
No. of samples with PEL	1,944	3,212	3,194	3,665	3,192	4,768	5,678	4,391	5,512	5,682	4,827	5,664	4,981	4,788	3,686	2,998	3,612	3,558	4,087	2,893	2,721
% > PEL	15.0	16.1	16.2	14.5	13.3	7.9	10.0	6.4	6.8	5.7	5.8	7.1	8.1	6.6	5.4	4.1	3.2	2.6	3.7	9.1	9.9
No. of samples with REL	1,395	2,322	1,959	2,189	1,962	3,005	3,455	2,630	3,346	3,262	2,644	3,099	2,809	2,761	2,447	2,713	3,947	5,903	6,510	6,090	1,974
% > REL	36.3	34.8	35.8	35.6	32.4	19.5	21.7	15.1	13.9	12.2	7.7	11.0	13.2	10.3	8.3	6.3	3.5	1.9	2.7	5.6	18.9
Other SIC 1-9, 13, 40-99																					
No. of samples with PEL	219	239	144	92	591	1,188	962	1,023	1,168	1,068	1,104	1,089	1,056	769	657	615	656	773	663	340	260
% > PEL	3.7	4.6	5.6	4.3	1.2	0.9	1.7	2.0	4.3	3.5	2.7	3.7	1.4	1.7	0.6	2.6	3.5	1.3	1.2	3.2	4.2
No. of samples with REL	138	185	93	77	530	1,033	870	798	1,040	818	899	783	793	577	538	613	794	798	833	362	209
% > REL	14.5	13.5	7.5	14.3	3.0	3.2	4.3	2.8	5.4	5.0	2.9	3.8	2.0	1.9	1.5	1.6	3.7	1.3	1.1	4.4	5.7

PEL - permissible exposure limit REL - recommended exposure limit SIC - Standard Industrial Classification

NOTE: From March 1, 1989 to March 22, 1993, the OSHA PELs in force differed from those employed before and after those dates. See appendices for source description, methods, and agents.

SOURCE: Occupational Safety and Health Administration (OSHA) Integrated Management Information System.

All Pneumoconioses: Pneumoconiotic Agents Exposures

Table 6-16. Pneumoconiotic agents: Number of samples and percent of exposures exceeding designated occupational exposure limits by industries with elevated pneumoconiosis mortality, MSHA inspector and mine operator and OSHA samples, 1990-1999

All Pneumoconioses Mortality, Selected States and Years, 1990-1999				No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
CIC	Industries with elevated PMRs and most frequently recorded on death certificates	Number of Deaths	PMR				
041	Coal mining	4,623	33.13	875,279	10.5	325,198	26.2*
262	Miscellaneous nonmetallic mineral and stone products	127	7.86	709	22.4	643	37.3
040	Metal mining	131	5.19	13,439	9.0	10,362	16.1
360	Ship and boat building and repairing	176	4.48	540	8.7	393	3.6
050	Nonmetallic mining and quarrying, except fuel	69	3.58	103,665	6.9	101,292	10.9
271	Iron and steel foundries	70	2.77	4,022	14.6	3,348	27.3
252	Structural clay products	29	2.62	314	22.3	307	35.8
192	Industrial and miscellaneous chemicals	159	1.75	541	7.0	413	11.1
211	Other rubber products, and plastics footwear and belting	48	1.45	245	8.2	310	7.7
250	Glass and glass products	55	1.37	348	0.3	289	2.4
	All other industries	2,741		43,383	4.6	42,171	4.2
	TOTAL			1,042,485	9.9	484,726	20.8

CIC - Census Industry Code PEL - permissible exposure limit REL - recommended exposure limit PMR - proportionate mortality ratio
 *This number is based solely on the the NIOSH REL for respirable coal mine dust of 1.0 mg/m³ which was adopted in September 1995. The MSHA respirable coal mine quartz exposure data and the NIOSH REL for respirable quartz cannot be compared to each other because they are based on different sampling criteria.

NOTE: See appendices for source description, methods, ICD codes, industry codes, agents, and list of selected states (and years) for which usual industry has been reported.

SOURCE: Mine Safety and Health Administration (MSHA) coal mine inspector and mine operator dust and quartz data and metal/nonmetal data. Occupational Safety and Health Administration (OSHA) Integrated Management Information System. National Center for Health Statistics multiple cause of death data.

Table 6-17 (page 1 of 2). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by MSHA coal mine district and states, MSHA inspector and mine operator samples, 1979-1999

MSHA Coal Mine District	All Years				1979 - 1988		1989 - 1992		1993 - 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with PEL	% > PEL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
District 1 (Anthracite coal mining regions in Pennsylvania)	41,934	3.5	7,576	8.9	20,987	3.4	7,975	2.8	12,972	4.0	7,576	8.9
District 2 (Bituminous coal mining regions in Pennsylvania)	303,583	9.9	35,457	23.9	202,334	10.3	38,816	11.0	62,433	8.0	35,457	23.9
District 3	270,667	11.5	30,269	23.3	178,203	13.3	37,109	8.8	55,355	7.3	30,269	23.3
Maryland	10,579	11.0	2,323	32.3	5,405	13.9	1,179	8.7	3,995	7.7	2,323	32.3
Ohio	90,025	14.5	8,242	22.5	65,421	17.1	10,168	9.0	14,436	6.5	8,242	22.5
Northern West Virginia	170,063	9.9	19,704	22.5	107,377	10.9	25,762	8.7	36,924	7.6	19,704	22.5
District 4 (Southern West Virginia)	472,288	14.2	60,324	27.4	294,243	15.6	74,563	11.7	103,482	12.1	60,324	27.4
District 5 (Virginia)	301,610	10.1	36,399	20.7	181,204	10.4	52,466	9.9	67,940	9.4	36,399	20.7
District 6 (Eastern Kentucky)	281,960	8.8	49,022	22.4	144,798	7.8	49,971	9.1	87,191	10.1	49,022	22.4
District 7	279,339	8.8	47,325	21.2	133,482	8.3	57,363	8.6	88,494	9.6	47,325	21.2
Central Kentucky	231,417	9.0	42,746	21.4	103,604	8.7	47,796	8.6	80,017	9.8	42,746	21.4
North Carolina	9	0.0	0	-	2	0.0	7	0.0	0	-	0	-
South Carolina	0	-	0	-	0	-	0	-	0	-	0	-
Tennessee	47,884	7.6	4,579	19.2	29,847	7.1	9,560	8.2	8,477	8.5	4,579	19.2
Northern Georgia	29	0.0	0	-	29	0.0	0	-	0	-	0	-
District 8	153,812	15.3	17,574	50.5	95,380	15.3	25,822	14.0	32,610	16.5	17,574	50.5
Illinois	137,945	15.9	14,857	52.0	86,573	16.2	23,347	14.7	28,025	16.2	14,857	52.0
Indiana	14,075	10.7	2,696	42.8	7,312	6.9	2,298	7.5	4,465	18.5	2,696	42.8
Iowa	940	6.4	0	-	794	6.5	127	6.3	19	0.0	0	-
Michigan	0	-	0	-	0	-	0	-	0	-	0	-
Minnesota	0	-	0	-	0	-	0	-	0	-	0	-
Northern Missouri	852	3.3	21	0.0	701	3.0	50	0.0	101	6.9	21	0.0
Wisconsin	0	-	0	-	0	-	0	-	0	-	0	-

See footnotes at end of table.

Table 6-17 (page 2 of 2). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by MSHA coal mine district and states, MSHA inspector and mine operator samples, 1979-1999

MSHA Coal Mine District	All Years				1979 - 1988		1989 - 1992		1993 - 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with PEL	% > PEL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
District 9	125,971	17.8	17,367	33.8	74,282	20.4	21,315	17.2	30,374	11.8	17,367	33.8
Alaska	258	5.8	14	0.0	179	7.3	54	3.7	25	0.0	14	0.0
Arizona	955	5.0	207	1.9	424	6.1	212	3.3	319	4.7	207	1.9
Arkansas	320	4.1	36	0.0	232	4.3	33	6.1	55	1.8	36	0.0
California	13	0.0	11	9.1	0	-	0	-	13	0.0	11	9.1
Colorado	39,718	21.2	4,937	40.7	24,351	24.8	6,438	19.0	8,929	12.6	4,937	40.7
Hawaii	0	-	0	-	0	-	0	-	0	-	0	-
Idaho	0	-	0	-	0	-	0	-	0	-	0	-
Kansas	534	3.4	73	1.4	368	4.3	70	0.0	96	2.1	73	1.4
Louisiana	115	0.0	44	0.0	12	0.0	23	0.0	80	0.0	44	0.0
Southern Missouri	689	3.8	114	7.0	439	4.3	59	1.7	191	3.1	114	7.0
Montana	1,817	7.2	391	5.6	1,087	8.6	160	5.6	570	4.9	391	5.6
Nebraska	0	-	0	-	0	-	0	-	0	-	0	-
Nevada	0	-	0	-	0	-	0	-	0	-	0	-
New Mexico	5,521	20.5	696	6.2	3,551	24.3	622	18.2	1,348	11.6	696	6.2
North Dakota	1,392	2.0	144	0.0	975	2.3	227	2.6	190	0.0	144	0.0
Oklahoma	5,239	9.1	799	9.8	2,835	10.0	1,025	10.7	1,379	6.0	799	9.8
Oregon	0	-	0	-	0	-	0	-	0	-	0	-
Texas	4,138	2.9	515	3.5	2,613	2.4	609	5.6	916	2.5	515	3.5
Utah	54,983	19.5	7,585	43.6	31,598	22.1	10,247	18.8	13,138	13.8	7,585	43.6
Washington	367	1.4	115	4.3	124	0.0	41	4.9	202	1.5	115	4.3
Wyoming	9,912	12.5	1,686	21.9	5,494	12.9	1,495	15.2	2,923	10.5	1,686	21.9
District 10 (Western Kentucky)	82,406	13.3	11,047	48.4	49,001	12.6	13,128	14.1	20,277	14.7	11,047	48.4
District 11	89,693	13.9	12,838	29.8	50,092	16.1	13,557	13.4	26,044	9.9	12,838	29.8
Alabama	89,693	13.9	12,838	29.8	50,092	16.1	13,557	13.4	26,044	9.9	12,838	29.8
Central and Southern Georgia	0	-	0	-	0	-	0	-	0	-	0	-
Florida	0	-	0	-	0	-	0	-	0	-	0	-
Mississippi	0	-	0	-	0	-	0	-	0	-	0	-
Puerto Rico	0	-	0	-	0	-	0	-	0	-	0	-
Virgin Islands	0	-	0	-	0	-	0	-	0	-	0	-
	0	-	0	-	0	-	0	-	0	-	0	-
TOTAL	2,403,263	11.6	325,198	26.2	1,424,006	12.4	392,085	10.7	587,172	10.3	325,198	26.2

- indicates incalculable field PEL - permissible exposure limit REL - recommended exposure limit
 NOTE: The NIOSH REL for respirable coal mine dust of 1.0 mg/m³ was adopted in September 1995. The MSHA respirable coal mine quartz exposure data and the NIOSH REL for respirable quartz cannot be compared to each other because they are based on different sampling criteria. See appendices for source description, methods, and agents.
 SOURCE: Mine Safety and Health Administration (MSHA) coal mine inspector and mine operator dust and quartz data.

Table 6-18 (page 1 of 2). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by MSHA metal/nonmetal district and state, MSHA samples, 1979-1999

MSHA Metal/Nonmetal Mine District	1979 - 1988				1989 - 1992				1993 - 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
Northeast	10,176	12.5	9,471	20.9	6,612	10.1	6,311	15.7	12,607	6.3	12,101	10.6
Connecticut	351	26.2	308	36.0	167	13.2	162	22.2	342	5.3	303	5.3
Delaware	30	33.3	23	0.0	33	0.0	33	3.0	41	4.9	41	0.0
District of Columbia	0	-	0	-	0	-	0	-	0	-	0	-
Maine	207	15.9	201	24.4	169	3.0	169	7.7	255	4.3	255	9.8
Maryland	563	4.1	556	10.1	364	3.3	341	6.7	645	2.5	624	6.1
Massachusetts	497	17.5	483	28.2	263	9.9	256	15.6	554	3.6	554	7.0
New Hampshire	132	15.2	132	33.3	133	7.5	133	16.5	248	7.3	239	12.6
New Jersey	1,055	17.0	1,013	28.1	625	12.3	623	20.1	914	4.2	911	8.0
New York	2,221	11.5	1,970	17.9	1,733	6.6	1,679	11.6	2,973	5.3	2,776	9.3
Pennsylvania	2,413	9.5	2,351	15.1	1,371	13.4	1,286	19.4	2,988	7.7	2,884	12.2
Rhode Island	64	23.4	60	35.0	35	8.6	35	25.7	114	15.8	111	25.2
Vermont	708	15.7	549	47.5	350	20.0	348	27.9	729	19.5	729	29.8
Virginia	1,312	8.6	1,215	13.2	939	9.1	869	12.7	2,188	4.2	2,115	7.4
West Virginia	623	17.3	610	24.3	430	13.0	377	18.6	616	5.8	559	10.0
Southeast	15,562	7.9	14,577	12.2	9,936	8.2	9,560	12.4	15,192	4.6	14,647	8.0
Alabama	1,097	4.4	1,055	6.5	876	8.0	876	11.9	1,351	6.2	1,342	9.5
Florida	1,215	5.3	966	6.4	841	2.1	836	5.0	1,481	1.3	1,397	2.4
Georgia	2,526	11.0	2,494	19.6	1,585	10.5	1,576	15.2	2,149	5.3	2,140	7.7
Kentucky	1,055	7.8	998	10.1	534	9.4	501	11.0	1,001	3.7	1,001	5.7
Mississippi	301	4.3	286	6.3	480	5.4	478	8.2	941	7.0	941	11.8
North Carolina	3,480	6.6	3,385	11.3	2,223	6.7	2,199	11.0	2,668	3.7	2,614	6.9
Puerto Rico	1,106	5.9	788	0.3	230	10.0	114	3.5	829	2.7	704	2.7
South Carolina	1,176	16.2	1,145	27.5	1,371	8.8	1,235	14.8	2,195	3.0	1,978	7.1
Tennessee	3,517	7.0	3,401	9.8	1,774	10.5	1,735	16.0	2,516	7.7	2,486	13.6
Virgin Islands	89	6.7	59	0.0	22	9.1	10	0.0	61	1.6	44	6.8
North Central	14,704	10.0	13,332	13.5	8,922	11.0	8,755	15.6	15,428	5.2	14,928	8.7
Illinois	3,046	17.6	2,912	20.4	1,414	13.0	1,396	19.2	2,564	4.8	2,426	8.1
Indiana	1,247	4.2	1,204	3.2	929	4.7	925	5.9	2,001	2.9	1,958	5.0
Iowa	692	5.5	681	5.1	573	5.2	572	4.9	883	1.6	877	1.8
Michigan	2,062	8.0	1,577	13.8	1,559	14.6	1,506	19.5	2,664	6.2	2,520	10.4
Minnesota	4,477	7.0	3,846	10.9	1,663	10.6	1,594	16.2	2,311	5.2	2,202	8.4
Ohio	1,414	14.1	1,387	18.8	1,716	9.0	1,713	14.4	2,987	6.7	2,973	11.7
Wisconsin	1,766	9.3	1,725	13.2	1,068	15.5	1,049	20.6	2,018	5.6	1,972	9.9

See footnotes at end of table.

Table 6-18 (page 2 of 2). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by MSHA metal/nonmetal district and state, MSHA samples, 1979-1999

MSHA Metal/Nonmetal Mine District	1979 - 1988				1989 - 1992				1993 - 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
South Central	8,315	13.4	7,860	17.9	9,558	9.4	9,483	13.6	15,513	5.3	14,775	7.8
Arkansas	596	32.4	556	44.8	672	16.4	664	28.3	1,231	7.6	1,207	13.6
Louisiana	319	7.8	288	11.5	748	4.0	748	6.1	1,475	4.2	1,451	7.5
Missouri	2,532	12.9	2,393	16.0	2,037	11.6	2,021	15.0	3,511	4.8	3,219	7.3
New Mexico	1,331	13.7	1,189	20.9	1,095	13.0	1,072	20.9	2,054	10.0	1,764	15.1
Oklahoma	1,628	9.9	1,600	13.7	1,340	10.9	1,340	16.6	2,067	4.2	2,016	7.7
Texas	1,909	11.8	1,834	14.9	3,666	6.4	3,638	8.4	5,175	4.0	5,118	4.3
Rocky Mountain	17,435	15.3	16,211	22.7	6,434	16.5	6,164	25.3	13,136	8.7	11,310	15.3
Arizona	2,709	17.6	2,548	28.5	745	18.8	733	28.4	3,098	6.8	2,348	13.7
Colorado	3,872	13.2	3,609	19.8	1,255	16.9	1,211	26.7	1,496	12.2	1,472	23.2
Kansas	1,316	12.6	1,289	14.0	553	9.8	544	12.5	1,036	6.2	949	7.8
Montana	1,915	10.7	1,568	17.6	842	20.3	733	31.2	1,071	10.2	958	18.3
Nebraska	54	5.6	53	5.7	260	2.7	257	4.7	490	1.8	480	2.5
Nevada	1,357	25.8	1,331	33.1	1,073	19.9	1,053	31.1	1,816	12.4	1,535	23.6
North Dakota	194	12.9	194	18.6	72	1.4	72	11.1	266	2.3	263	7.6
South Dakota	1,814	14.4	1,698	24.5	356	9.8	321	14.6	1,075	5.5	835	10.4
Utah	2,433	16.2	2,165	19.5	957	19.1	919	29.4	1,627	8.8	1,384	16.2
Wyoming	1,771	15.2	1,756	26.1	321	15.0	321	20.9	1,161	11.6	1,086	10.9
Western	5,217	13.8	4,937	21.8	4,639	11.7	4,519	19.1	8,086	5.7	7,713	9.0
Alaska	93	20.4	91	27.5	88	10.2	56	25.0	399	4.3	282	11.3
California	2,511	15.1	2,482	26.5	2,571	11.7	2,513	21.2	2,880	7.6	2,799	11.6
Hawaii	11	0.0	11	0.0	57	3.5	57	1.8	208	1.0	202	1.0
Idaho	1,230	16.4	1,034	23.4	590	15.9	560	26.1	1,374	6.7	1,244	13.5
Oregon	422	4.3	422	6.4	705	7.4	705	7.9	1,595	1.9	1,586	1.8
Washington	950	10.6	897	13.8	628	13.7	628	18.0	1,630	6.1	1,600	8.7
TOTAL	71,409	11.8	66,388	17.6	46,101	10.8	44,792	16.2	79,962	5.9	75,474	9.7

- indicates incalculable field

PEL - permissible exposure limit REL - recommended exposure limit

NOTE: See appendices for source description, methods, and agents.

SOURCE: Mine Safety and Health Administration (MSHA) metal/nonmetal mine data.

Table 6-19 (page 1 of 3). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by OSHA region and state, OSHA samples, 1979-1999

OSHA Region	1979 – 1988				1989 – 1992 OSHA PELs changed. See note.				1993 – 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
Region 1	4,523	8.6	3,332	20.6	2,460	2.3	1,526	3.4	2,917	3.3	3,822	3.7
Connecticut	1,159	7.2	987	17.7	785	2.4	542	2.8	1,037	0.5	1,191	0.9
Maine	186	16.1	135	23.7	94	0.0	62	0.0	90	12.2	57	1.8
Massachusetts	1,889	8.3	1,280	22.4	1,206	2.4	693	3.2	1,345	3.9	1,704	5.3
New Hampshire	637	6.3	459	20.7	342	1.5	209	5.3	394	3.6	488	4.1
Rhode Island	650	11.8	469	21.1	31	12.9	19	21.1	51	27.5	376	5.1
Vermont	2	0.0	2	0.0	2	0.0	1	0.0	0	-	6	0.0
Region 2	4,520	9.8	3,653	20.6	2,267	3.2	1,646	7.2	3,309	7.0	2,760	8.7
New Jersey	1,576	12.4	1,236	25.0	846	3.5	568	8.8	1,069	3.4	912	2.6
New York	2,872	8.5	2,353	18.5	1,330	3.1	998	6.6	2,194	8.8	1,763	12.3
Puerto Rico	67	4.5	59	11.9	66	0.0	58	0.0	43	0.0	82	0.0
U.S. Virgin Islands	5	0.0	5	0.0	25	8.0	22	9.1	3	0.0	3	0.0
Region 3	6,629	12.2	4,685	29.3	1,768	16.5	1,070	21.5	2,022	9.2	1,832	10.8
Delaware	136	5.1	65	15.4	0	-	0	-	11	18.2	7	28.6
District of Columbia	130	0.8	124	9.7	20	10.0	14	0.0	22	9.1	12	0.0
Maryland	514	8.9	297	19.5	319	12.2	131	26.7	224	7.1	104	13.5
Pennsylvania	4,164	13.0	3,040	31.3	1,044	17.0	663	19.6	1,422	11.3	1,257	14.1
Virginia	849	12.5	652	31.0	211	26.5	159	32.7	236	1.3	379	0.3
West Virginia	836	12.3	507	27.0	174	9.2	103	12.6	107	2.8	73	4.1
Region 4	6,433	12.0	4,586	24.3	4,276	5.8	2,752	10.0	5,666	4.2	7,937	4.3
Alabama	998	17.2	686	33.2	550	7.1	388	16.5	836	1.3	917	1.5
Florida	644	4.3	427	10.3	548	1.8	353	2.3	251	2.8	1,801	0.5
Georgia	1,878	14.2	1,387	26.2	1,182	3.4	755	6.6	946	6.7	1,393	6.7
Kentucky	733	8.2	519	16.0	414	8.2	274	10.9	938	3.9	478	6.9
Mississippi	287	10.5	193	30.1	272	2.2	182	2.7	264	2.3	614	1.5
North Carolina	783	11.9	621	26.9	525	11.4	403	17.6	1,494	3.9	1,574	5.5
South Carolina	653	8.6	441	16.8	482	5.4	229	7.9	636	4.4	914	4.5
Tennessee	457	14.9	312	30.8	303	11.6	168	16.7	301	8.3	246	21.5

See footnotes at end of table.

Table 6-19 (page 2 of 3). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by OSHA region and state, OSHA samples, 1979-1999

OSHA Region	1979 – 1988				1989 – 1992 OSHA PELs changed. See note.				1993 – 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
Region 5	13,020	9.8	8,134	22.8	8,564	6.3	4,776	8.9	10,161	4.7	8,643	6.7
Illinois	3,263	7.6	2,043	15.9	2,230	7.2	1,110	5.6	3,888	2.9	3,407	3.7
Indiana	927	12.6	591	36.0	327	4.6	229	11.4	474	7.0	298	11.4
Michigan	214	0.5	158	2.5	1,341	5.1	798	6.0	1,855	3.6	1,106	9.5
Minnesota	116	32.8	98	52.0	114	3.5	76	5.3	24	25.0	24	25.0
Ohio	5,494	9.4	3,310	22.1	2,181	4.5	1,332	8.5	1,305	9.2	1,543	8.8
Wisconsin	3,006	11.9	1,934	27.2	2,371	8.3	1,231	14.1	2,615	5.5	2,265	7.7
Region 6	6,303	6.8	3,686	15.6	2,360	4.2	1,376	9.0	2,043	4.8	5,421	2.0
Arkansas	606	6.9	332	13.9	176	7.4	123	12.2	224	8.9	1,973	1.2
Louisiana	449	7.6	265	19.2	190	2.1	87	4.6	42	11.9	38	18.4
New Mexico	22	27.3	17	35.3	18	0.0	18	0.0	15	40.0	22	27.3
Oklahoma	1,698	3.5	877	9.8	447	2.2	245	3.3	296	3.4	1,361	1.2
Texas	3,528	8.1	2,195	17.6	1,529	4.6	903	10.7	1,466	4.0	2,027	2.6
Region 7	3,951	6.2	2,509	15.5	1,647	8.4	954	7.8	1,187	10.1	1,724	5.3
Iowa	1,585	6.8	880	16.5	609	6.4	322	10.9	416	11.8	242	23.1
Kansas	700	4.3	418	14.8	248	3.2	157	9.6	376	8.0	1,013	2.5
Missouri	1,200	7.4	920	16.4	619	12.3	345	6.1	122	30.3	297	3.0
Nebraska	466	4.3	291	11.0	171	8.8	130	2.3	273	1.5	172	1.2
Region 8	4,158	4.3	2,374	10.7	1,604	5.9	824	6.6	1,527	5.9	2,238	4.5
Colorado	2,385	4.4	1,285	11.1	1,078	3.1	600	4.5	756	4.2	718	6.0
Montana	709	3.0	471	11.0	261	12.6	117	8.5	205	7.3	209	6.2
North Dakota	455	4.8	236	12.3	71	4.2	29	3.4	164	15.2	177	16.4
South Dakota	484	2.9	278	5.0	126	18.3	25	28.0	203	8.4	522	3.1
Utah	95	16.8	77	22.1	58	3.4	48	18.8	22	4.5	267	0.0
Wyoming	30	0.0	27	3.7	10	0.0	5	0.0	177	0.0	345	0.0

See footnotes at end of table.

All Pneumoconioses: Pneumoconiotic Agents Exposures

Table 6-19 (page 3 of 3). Pneumoconiotic agents: Percent of exposures exceeding designated occupational exposure limits by OSHA region and state, OSHA samples, 1979-1999

OSHA Region	1979 – 1988				1989 – 1992 OSHA PELs changed. See note.				1993 – 1999			
	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL	No. of Samples with PEL	% > PEL	No. of Samples with REL	% > REL
Region 9	1,707	8.1	1,150	16.3	792	7.1	570	10.0	389	5.1	789	2.9
American Samoa	0	-	0	-	0	-	0	-	0	-	0	-
Arizona	165	10.3	123	20.3	136	1.5	62	4.8	31	6.5	22	9.1
California	1,306	4.1	837	10.3	492	5.9	385	7.8	307	3.9	714	2.1
Guam	3	0.0	3	0.0	0	-	0	-	0	-	0	-
Hawaii	47	0.0	44	2.3	8	0.0	8	0.0	22	13.6	18	16.7
Nevada	186	36.6	143	53.1	156	16.0	115	20.9	29	10.3	35	8.6
Region 10	876	8.0	627	17.9	664	10.1	409	8.3	930	9.0	786	16.7
Alaska	194	2.1	178	3.4	47	6.4	42	9.5	26	0.0	38	0.0
Idaho	215	4.2	141	11.3	308	2.6	182	4.9	167	0.0	109	0.0
Oregon	439	11.2	299	28.4	61	9.8	31	6.5	252	5.2	142	11.3
Washington	28	28.6	9	55.6	248	20.2	154	12.3	485	14.6	497	23.1
TOTAL	52,120	9.1	34,736	21.0	26,402	6.3	15,903	9.1	30,151	5.4	35,952	5.4

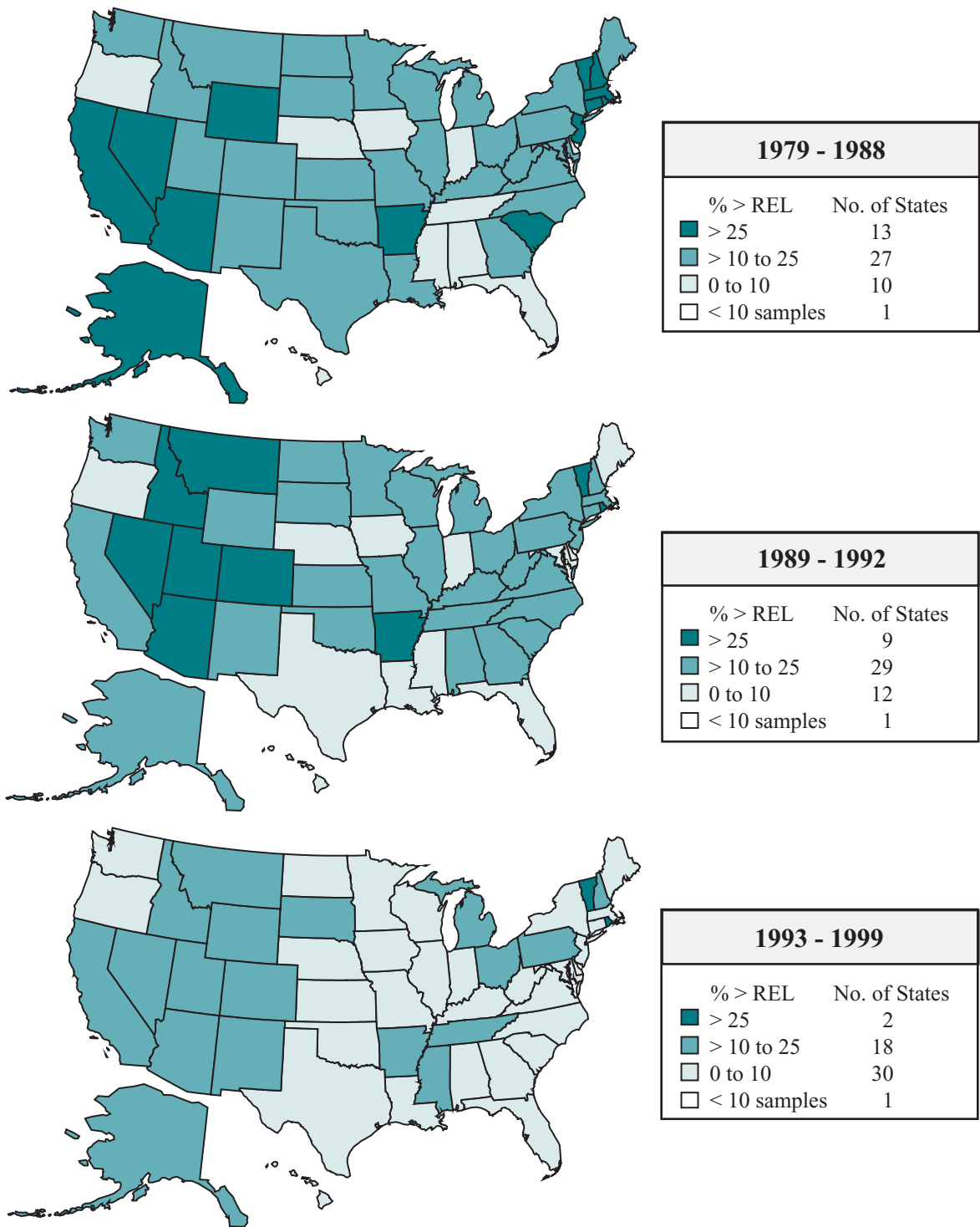
- indicates incalculable field

PEL - permissible exposure limit REL - recommended exposure limit

NOTE: From March 1, 1989 to March 22, 1993, the OSHA PELs in force differed from those employed before and after those dates. See appendices for source description, methods, and agents.

SOURCE: Occupational Safety and Health Administration (OSHA) Integrated Management Information System.

Figure 6-6. Pneumoconiotic agents: Percent of exposures exceeding the NIOSH recommended exposure limits by state, MSHA metal/nonmetal mine samples, 1979-1999

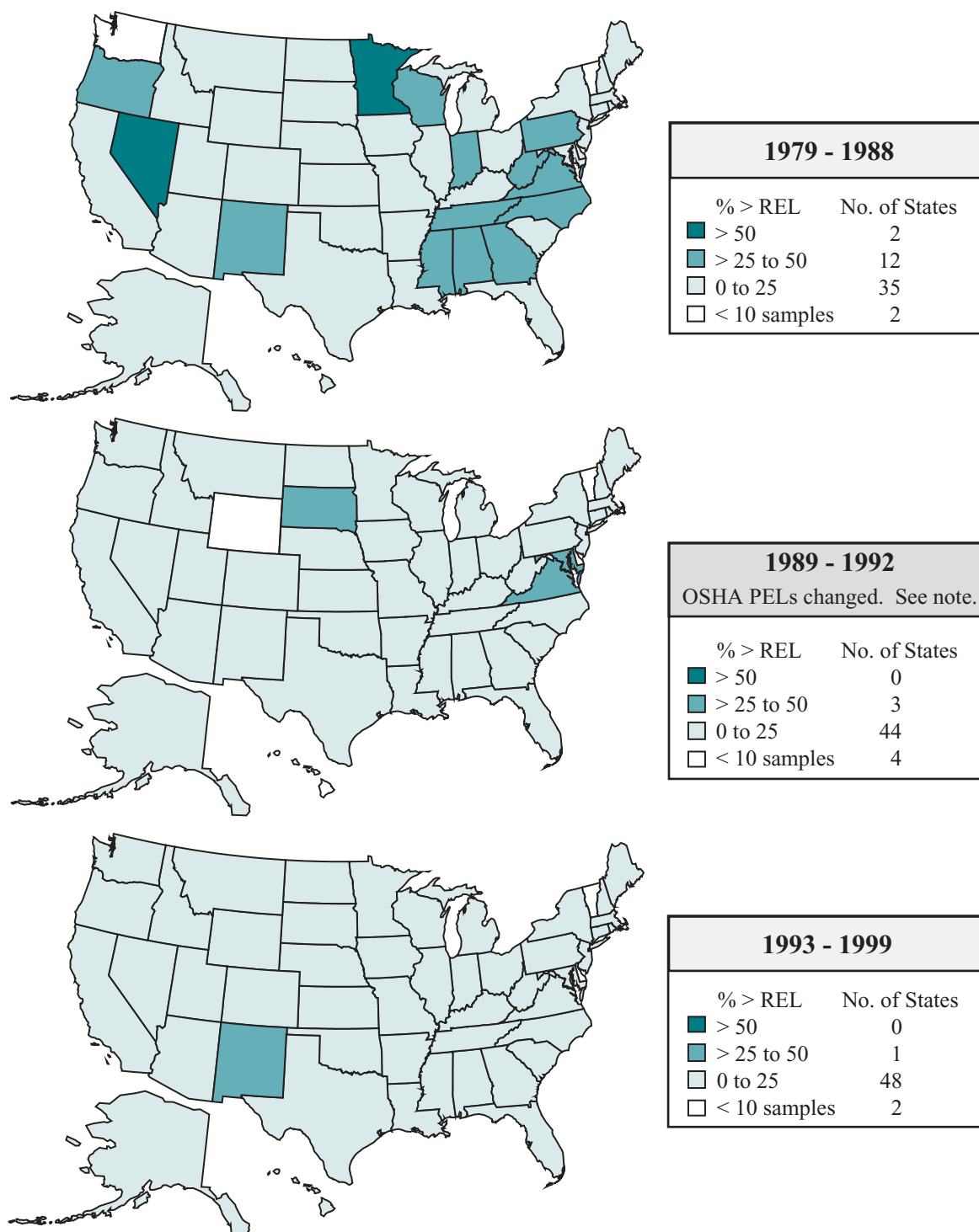


REL - recommended exposure limit

NOTE: See appendices for source description, methods, and agents.

SOURCE: Mine Safety and Health Administration (MSHA) metal/nonmetal mine data

Figure 6-7. Pneumoconiotic agents: Percent of exposures exceeding the NIOSH recommended exposure limits by state, OSHA samples, 1979-1999



REL - recommended exposure limit

PEL - permissible exposure limit

NOTE: From March 1, 1989 to March 22, 1993, the OSHA PELs in force differed from those employed before and after those dates. See appendices for source description, methods, and agents.

SOURCE: Occupational Safety and Health Administration (OSHA) Integrated Management Information System.