

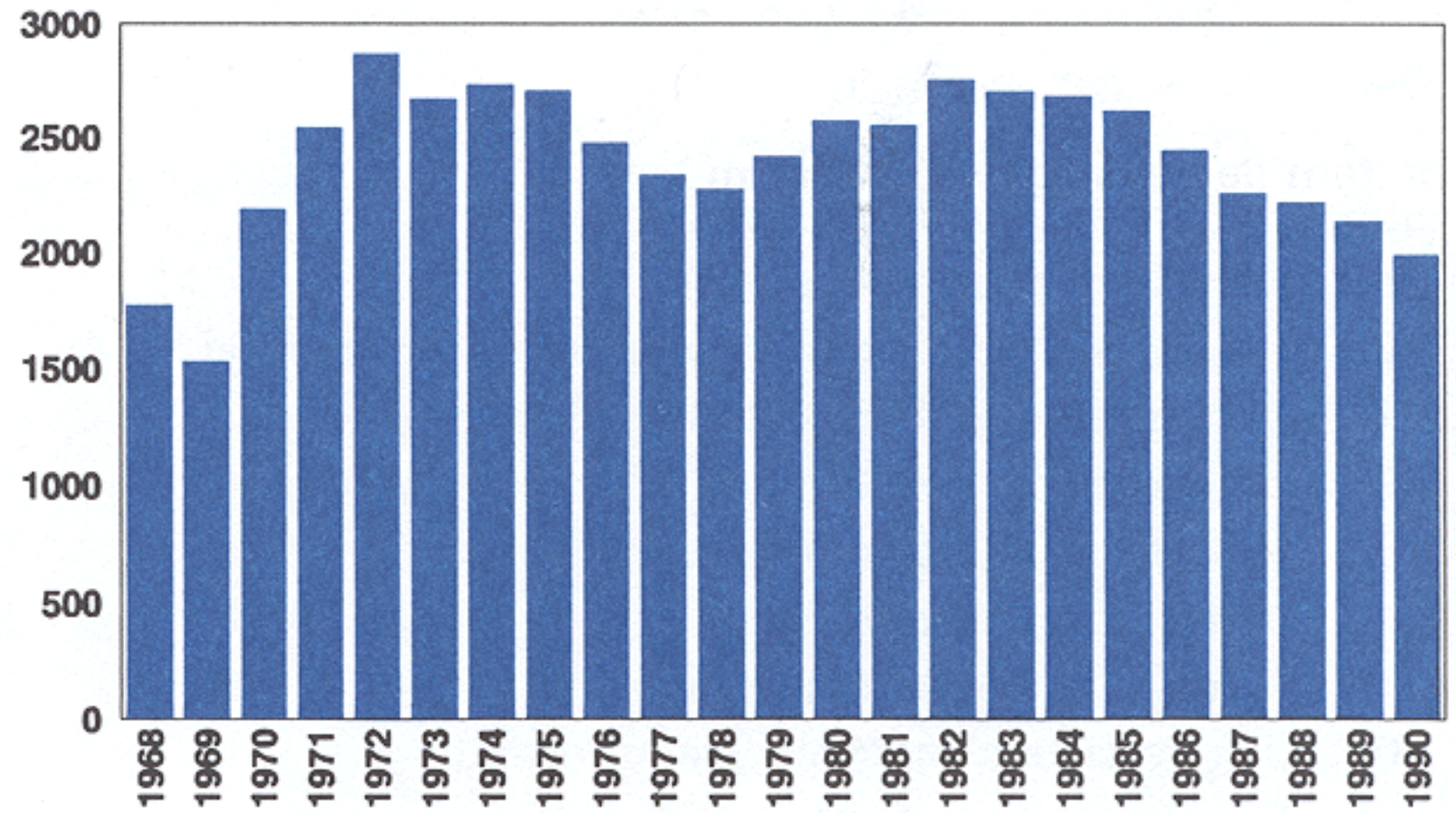
COAL WORKERS' PNEUMOCONIOSIS

Mortality

Coal workers' pneumoconiosis includes ICD-8 code 515.1 (anthracosilicosis) for 1968-1978 and ICD-9 code 500 (coal workers' pneumoconiosis) for 1979-1990.

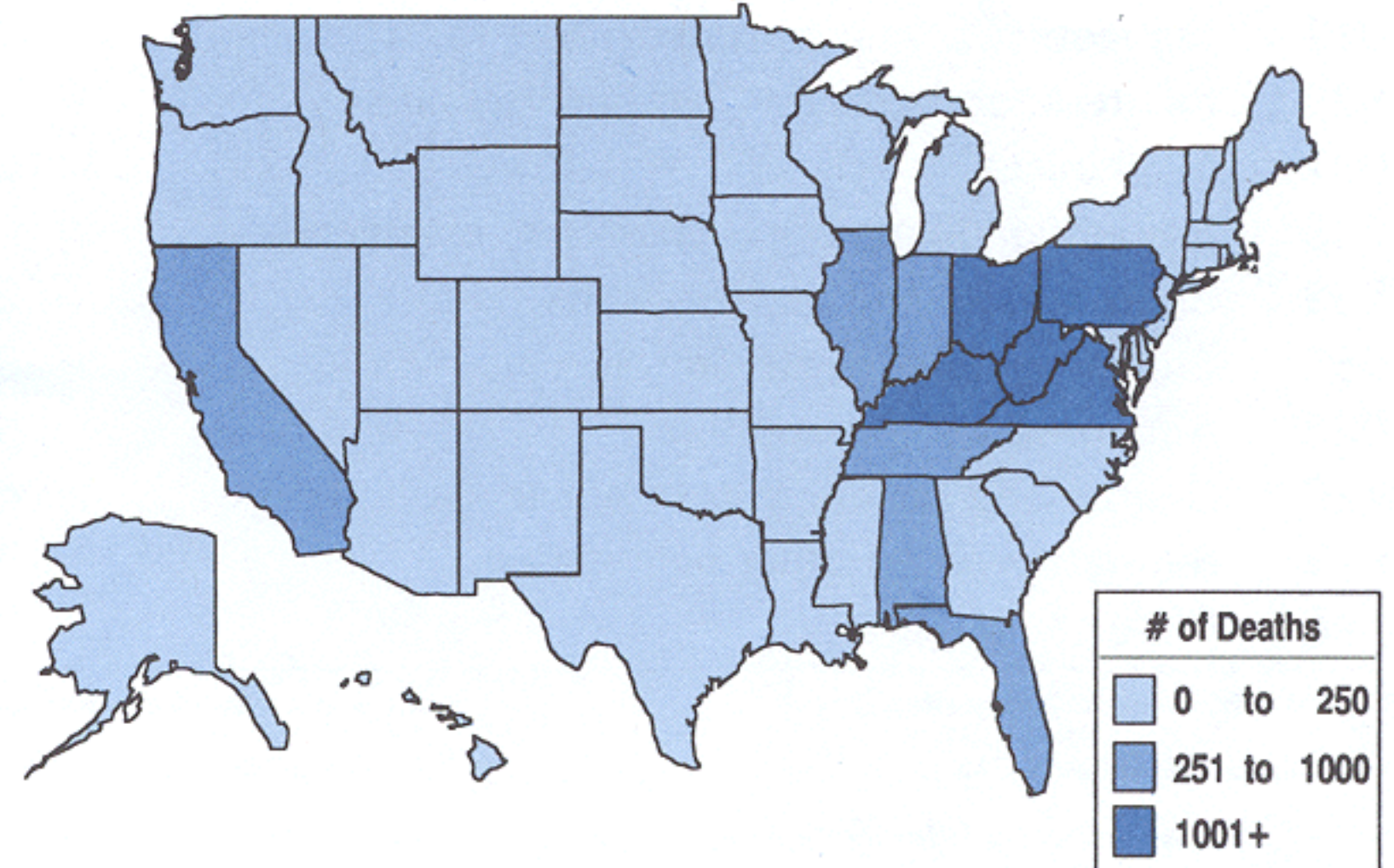
- The total number of deaths with mention of coal workers' pneumoconiosis between 1968 and 1990 was 55,476. Racial distribution was 97% white, 3% black and less than 1% other races. Over 99% of deaths with coal workers' pneumoconiosis occurred in males.
- See Tables 3-3, 3-4 and 3-5 for data.
- See Appendix A for information about multiple cause of death data.

Figure 3-1. Coal workers' pneumoconiosis: number of deaths, U.S. residents age 15 and over, 1968-1990



- Pennsylvania had the highest number of deaths with CWP (n = 16,994). West Virginia ranked second with 3,339 deaths. Together these two states accounted for 69% of deaths with coal workers' pneumoconiosis from 1979-1990.

Figure 3-2. Coal workers' pneumoconiosis: number of deaths, U.S. residents age 15 and over, by state, 1979-1990



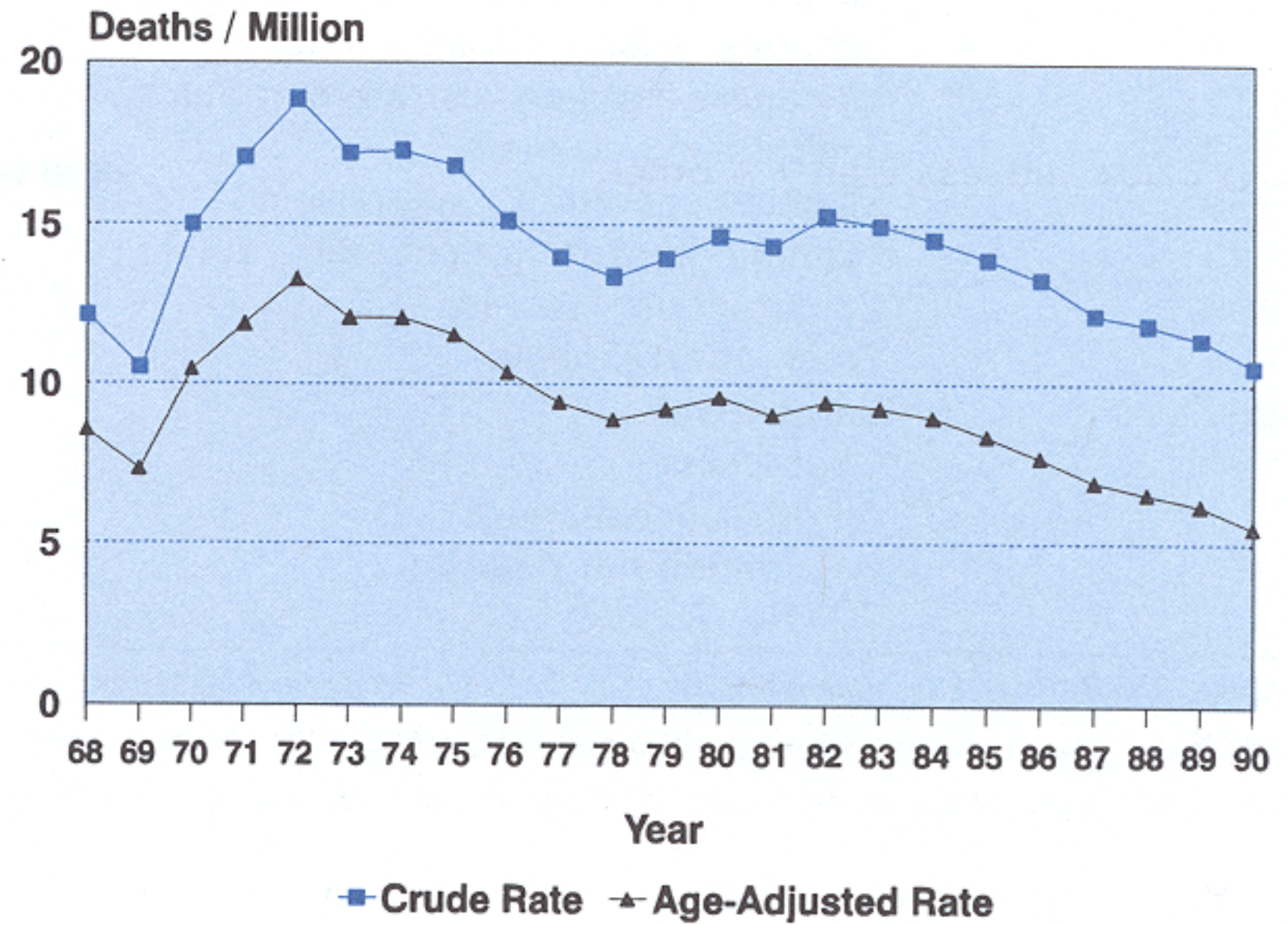
- See Table 3-5 for data.

- The maximum crude rate for CWP between 1968 and 1990 occurred in 1972. Between 1972 and 1990, the crude rate decreased 44%. The age-adjusted rates show a parallel pattern decreasing by 58% from 1972 to 1990.

- See Tables 3-6 and 3-7 for data.

- See Appendix B for methods.

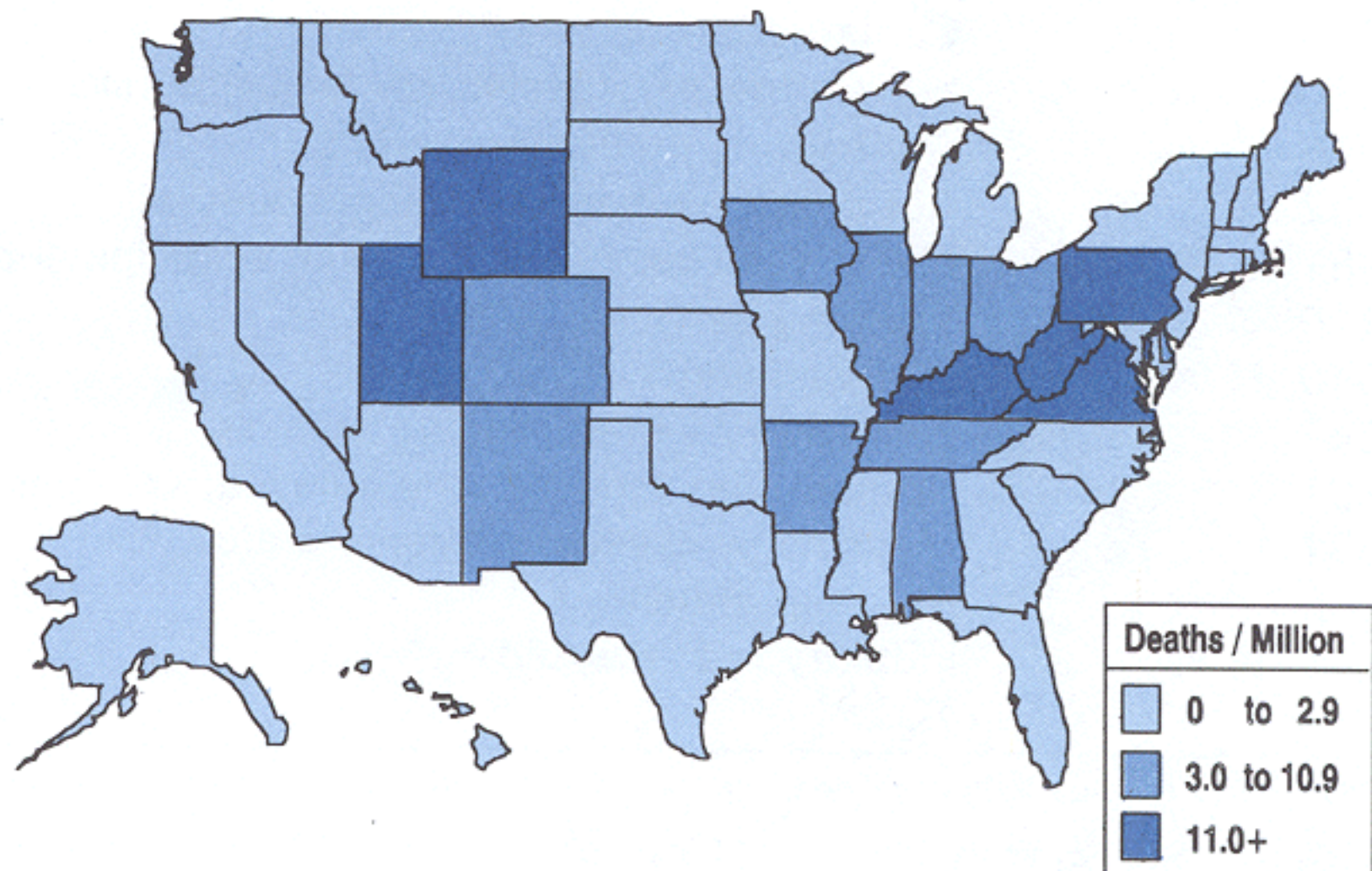
Figure 3-3. Coal workers' pneumoconiosis: crude and age-adjusted mortality rates, U.S. residents age 15 and over, 1968-1990



- Among those states with the highest crude mortality rates, West Virginia (218 deaths per million) ranked first and Pennsylvania (112 deaths per million) ranked second, followed by Kentucky (44 deaths per million) and Virginia (29 deaths per million).

- See Table 3-10 for data.

Figure 3-4. Coal workers' pneumoconiosis: crude mortality rates, U.S. residents age 15 and over, by state, 1989-1990



COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-1. Coal workers' pneumoconiosis: most frequently recorded occupations on death certificate, U.S. residents age 15 and over, selected states and years, 1985-1990

COC	Occupation	Number	Percent
616	Mining machine operators	2,139	69.0
889	Laborers, except construction	93	3.0
019	Managers and administrators, n.e.c.	41	1.3
453	Janitors and cleaners	36	1.2
779	Machine operators, not specified	36	1.2
473	Farmers, except horticultural	32	1.0
869	Construction, laborers	30	1.0
804	Truck drivers, heavy	29	0.9
567	Carpenters	27	0.9
575	Electricians	25	0.8
	All other occupations	480	15.5
	Occupation not reported	131	4.2
	TOTAL	3,099	100.0

COC - 1980 Census Occupation Code

n.e.c. - not elsewhere classified

NOTE: See Appendix C for list of 25 states reporting usual occupation and years reporting.

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

Table 3-2. Coal workers' pneumoconiosis: most frequently recorded industries on death certificate, U.S. residents age 15 and over, selected states and years, 1985-1990

CIC	Industry	Number	Percent
041	Coal mining	2,271	73.3
060	Construction	100	3.2
270	Blast furnaces, steelworks, finishing mills	38	1.2
010	Agricultural production, crops	34	1.1
392	Not specified manufacturing industries	33	1.1
351	Motor vehicles and motor vehicle equipment	29	0.9
410	Trucking services	23	0.7
040	Metal mining	21	0.7
842	Elementary and secondary schools	18	0.6
961	Homemaker, student, unemployed, volunteer	18	0.6
331	Machinery, except electrical, n.e.c.	16	0.5
	All other industries	360	11.6
	Industry not reported	138	4.5
	TOTAL	3,099	100.0

CIC - 1980 Census Industry Code

n.e.c. - not elsewhere classified

NOTE: See Appendix C for list of 25 states reporting usual industry and years reporting.

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

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-3. Coal workers' pneumoconiosis: number of deaths, U.S. residents age 15 and over, by age, race, and sex, 1968-1990

Years		1968-1978		1979-1990		1989-1990	
Total Deaths		26,123	%	29,344	%	4,126	%
Sex	Male	25,923	99.2	29,149	99.3	4,102	99.4
	Female	200	0.8	195	0.7	24	0.6
Race	White	25,426	97.3	28,320	96.5	3,972	96.3
	Black	692	2.6	1,004	3.4	146	3.5
	Other	5	0.0	20	0.1	8	0.2
Race/Sex	White Male	25,237	96.6	28,157	95.9	3,952	95.8
	White Female	189	0.7	163	0.6	20	0.5
	Black Male	683	2.6	975	3.3	143	3.5
	Black Female	9	0.0	29	0.1	3	0.1
	Other Male	3	0.0	17	0.1	7	0.2
	Other Female	2	0.0	3	0.0	1	0.0
Age	Years						
	15-24	11	0.0	5	0.0	0	0.0
	25-34	15	0.1	12	0.0	1	0.0
	35-44	108	0.4	60	0.2	11	0.3
	45-54	1,096	4.2	485	1.7	55	1.3
	55-64	5,476	21.0	3,382	11.5	286	6.9
	65-74	9,789	37.5	10,679	36.4	1,284	31.1
	75-84	7,697	29.5	10,997	37.5	1,853	44.9
	85 and Over	1,931	7.4	3,724	12.7	636	15.4
	Mean	70.8		74.3		76.1	
Range	15-102		21-106		34-104		

NOTE: See Appendix B for methods. Percentages may not total to 100% due to rounding.

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

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-4. Coal workers' pneumoconiosis: number of deaths, U.S. residents age 15 and over, by state, 1968-1978

State	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
Alabama	3	7	2	5	8	6	12	17	22	27	17	126
Alaska	-	1	-	-	-	-	-	-	-	-	-	1
Arizona	2	2	2	2	2	5	4	-	5	2	6	32
Arkansas	-	2	1	2	-	3	-	1	1	3	4	17
California	14	12	18	17	18	20	21	25	24	17	20	206
Colorado	1	2	6	5	12	10	11	14	11	11	11	94
Connecticut	6	4	3	7	10	5	2	4	1	2	2	46
Delaware	3	1	2	2	-	-	2	3	-	2	2	17
District of Columbia	1	-	1	1	2	-	-	1	2	-	-	8
Florida	20	12	10	9	16	9	23	22	24	17	36	198
Georgia	-	-	-	2	-	2	1	2	3	1	1	12
Hawaii	-	-	-	-	-	-	-	1	-	-	-	1
Idaho	-	-	-	-	-	1	-	-	-	-	-	1
Illinois	6	8	24	40	36	33	20	40	33	34	31	305
Indiana	4	3	2	9	6	14	12	14	14	18	8	104
Iowa	-	-	1	1	4	7	3	2	6	7	4	35
Kansas	1	-	-	1	4	5	7	1	2	2	5	28
Kentucky	3	7	34	80	88	72	89	89	97	94	84	737
Louisiana	-	1	1	-	-	-	-	1	1	1	-	5
Maine	-	-	-	-	-	1	-	-	-	-	-	1
Maryland	4	5	6	5	12	6	6	8	3	4	6	65
Massachusetts	1	1	4	-	8	4	1	2	-	1	4	26
Michigan	7	9	17	16	12	10	9	12	22	11	10	135
Minnesota	2	-	-	1	2	1	1	-	-	1	1	9
Mississippi	-	2	-	-	-	-	-	2	2	1	-	7
Missouri	2	1	3	2	2	3	5	2	1	3	1	25
Montana	-	2	-	-	4	1	1	2	2	-	-	12
Nebraska	-	-	2	1	-	-	-	1	-	-	-	4
Nevada	-	-	1	-	-	-	-	1	-	-	2	4
New Hampshire	-	-	-	1	2	1	-	1	-	2	-	7
New Jersey	24	19	23	25	22	15	29	20	18	15	19	229
New Mexico	-	-	1	3	2	3	4	1	4	3	2	23
New York	18	12	17	17	22	9	18	18	17	10	9	167
North Carolina	2	3	3	1	-	4	2	4	4	3	4	30
North Dakota	-	1	-	-	-	-	-	-	-	-	-	1
Ohio	24	16	28	30	28	35	48	56	50	61	41	417
Oklahoma	-	-	-	1	4	1	1	3	2	4	3	19
Oregon	-	-	-	1	2	-	1	2	2	3	-	11
Pennsylvania	1,589	1,347	1,878	2,087	2,274	2,136	2,158	2,088	1,879	1,785	1,744	20,965
Rhode Island	-	-	1	-	-	2	2	-	-	-	-	5
South Carolina	-	-	2	1	-	-	1	2	2	1	2	11
South Dakota	-	-	-	1	-	-	-	-	-	-	2	3
Tennessee	-	4	6	8	20	17	17	19	13	14	22	140
Texas	2	3	2	1	-	4	5	3	3	6	2	31
Utah	-	3	-	-	-	4	3	5	2	3	4	24
Vermont	-	-	-	1	-	-	-	-	-	-	-	1
Virginia	3	4	10	46	48	45	43	55	55	40	49	398
Washington	1	1	3	-	2	3	4	2	-	1	2	19
West Virginia	30	37	70	109	190	166	156	159	148	125	115	1,305
Wisconsin	2	1	4	1	-	1	3	1	2	3	1	19
Wyoming	-	1	1	2	8	6	7	2	4	2	4	37
TOTAL	1,775	1,534	2,189	2,544	2,870	2,670	2,732	2,708	2,481	2,340	2,280	26,123

NOTE: See Appendix B for methods.

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

- indicates quantity zero.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-5. Coal workers' pneumoconiosis: number of deaths, U.S. residents age 15 and over, by state, 1979-1990

State	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	TOTAL
Alabama	19	13	18	40	32	26	30	32	23	33	33	29	328
Alaska	-	-	-	-	-	1	-	1	-	-	-	-	2
Arizona	6	8	14	10	9	10	8	7	2	4	5	5	88
Arkansas	3	7	4	8	8	4	9	6	7	3	4	9	72
California	24	24	24	21	25	24	20	23	18	16	7	28	254
Colorado	8	10	16	15	10	25	22	15	15	21	17	15	189
Connecticut	12	7	3	1	4	7	6	3	3	1	6	2	55
Delaware	-	3	3	-	4	3	1	4	1	2	1	4	26
District of Columbia	2	-	1	1	1	-	-	-	-	1	-	-	6
Florida	35	32	52	26	35	32	20	38	34	35	35	25	399
Georgia	2	2	4	2	1	4	3	6	2	6	7	4	43
Hawaii	-	-	1	1	-	-	-	1	-	-	-	-	3
Idaho	-	-	-	-	-	-	2	-	1	-	-	-	3
Illinois	36	41	86	68	68	83	78	64	63	53	38	49	727
Indiana	15	22	24	16	22	25	21	22	25	25	27	19	263
Iowa	7	5	11	6	8	6	10	8	3	6	9	6	85
Kansas	2	1	1	3	2	6	6	7	2	-	4	2	36
Kentucky	109	130	159	242	196	177	195	182	161	168	137	115	1,971
Louisiana	-	-	-	-	3	2	2	1	2	-	3	1	14
Maine	-	-	-	-	-	-	1	-	-	-	1	-	2
Maryland	9	8	13	19	19	3	5	8	8	6	5	12	115
Massachusetts	2	3	1	2	-	-	-	1	-	2	1	2	14
Michigan	12	15	19	23	24	14	17	16	21	20	14	21	216
Minnesota	1	1	-	4	1	1	-	-	-	-	-	-	8
Mississippi	1	-	2	2	-	1	1	-	1	2	-	2	12
Missouri	9	5	9	10	5	2	5	4	7	8	7	4	75
Montana	2	-	2	-	-	1	2	3	1	-	-	-	11
Nebraska	-	-	-	1	-	-	-	-	-	-	-	-	1
Nevada	1	-	1	2	1	3	2	-	-	-	1	1	12
New Hampshire	-	-	-	-	-	-	-	-	-	1	-	-	1
New Jersey	23	17	15	18	21	22	11	12	18	24	22	11	214
New Mexico	6	2	2	4	6	4	5	4	2	2	4	3	44
New York	16	24	16	15	15	6	11	16	13	13	13	9	167
North Carolina	2	12	9	8	15	4	7	10	12	6	11	12	108
North Dakota	-	-	-	-	-	-	-	1	1	-	1	1	4
Ohio	68	92	105	86	105	93	105	92	91	102	90	79	1,108
Oklahoma	3	2	10	4	6	3	4	5	8	4	3	5	57
Oregon	-	3	1	4	3	2	-	2	3	7	2	1	28
Pennsylvania	1,753	1,719	1,602	1,594	1,515	1,552	1,480	1,303	1,211	1,153	1,082	1,030	16,994
Rhode Island	1	-	-	-	-	-	-	-	-	1	-	-	2
South Carolina	-	4	1	1	2	1	2	1	2	1	3	1	19
South Dakota	-	1	2	1	1	1	-	1	-	2	1	-	10
Tennessee	16	25	35	33	37	41	40	39	39	45	33	37	420
Texas	6	4	5	12	7	8	11	7	1	7	5	5	78
Utah	3	1	6	14	4	17	14	16	12	16	14	18	135
Vermont	-	-	-	-	1	-	1	-	1	2	1	-	6
Virginia	46	56	66	110	129	133	167	169	150	157	146	131	1,460
Washington	3	7	2	6	4	4	3	7	6	4	3	6	55
West Virginia	153	262	204	315	345	326	281	302	284	255	333	279	3,339
Wisconsin	1	2	3	3	3	1	1	-	1	1	2	3	21
Wyoming	-	6	2	2	4	5	6	4	2	4	5	4	44
TOTAL	2,417	2,576	2,554	2,753	2,701	2,683	2,615	2,443	2,257	2,219	2,136	1,990	29,344

NOTE: See Appendix B for methods.

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

- indicates quantity zero.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-6. Coal workers' pneumoconiosis: crude mortality rates (per 1,000,000 population), U.S. residents age 15 and over, by race and sex, 1968-1990

Year	Overall rate	White		Black	
		Males	Females	Males	Females
1968	12.15	27.87	0.19	3.91	0.11
1969	10.50	24.14	0.06	4.04	-
1970	14.99	34.29	0.15	6.26	0.11
1971	17.06	38.96	0.31	6.42	0.11
1972	18.85	43.01	0.26	8.50	-
1973	17.20	39.00	0.27	9.53	0.20
1974	17.27	39.23	0.32	9.12	0.10
1975	16.81	38.34	0.34	7.96	-
1976	15.11	34.32	0.28	8.88	0.09
1977	14.00	31.89	0.25	7.80	0.18
1978	13.40	30.80	0.21	6.26	-
1979	13.96	32.16	0.17	6.47	0.08
1980	14.65	33.84	0.14	6.98	0.08
1981	14.34	33.07	0.17	7.06	0.32
1982	15.27	35.03	0.26	9.01	-
1983	14.96	34.23	0.16	9.83	0.31
1984	14.53	33.81	0.16	6.24	0.29
1985	13.93	32.28	0.14	6.62	0.22
1986	13.31	29.69	0.25	9.66	0.26
1987	12.18	27.35	0.13	8.39	0.26
1988	11.89	26.82	0.16	6.89	0.25
1989	11.43	25.79	0.09	7.14	0.08
1990	10.55	23.67	0.14	6.73	0.16

NOTE: See Appendix B for methods.

SOURCE: National Center for Health Statistics multiple cause of death data tapes.
U.S. Bureau of the Census: 1970-1990 population estimates of the U.S.

- indicates no deaths listed.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-7. Coal workers' pneumoconiosis: age-adjusted mortality rates (per 1,000,000 population), U.S. residents age 15 and over, by race and sex, 1968-1990

Year	Overall rate	White		Black	
		Males	Females	Males	Females
1968	8.54	21.03	0.12	3.72	0.11
1969	7.31	18.10	0.05	3.87	-
1970	10.47	25.80	0.09	5.87	0.10
1971	11.92	29.41	0.17	6.17	0.12
1972	13.32	32.92	0.11	8.16	-
1973	12.10	29.89	0.15	8.94	0.17
1974	12.11	30.08	0.17	8.48	0.11
1975	11.58	29.08	0.22	7.58	-
1976	10.38	26.02	0.12	8.45	0.08
1977	9.44	23.81	0.17	7.45	0.15
1978	8.89	22.71	0.10	6.24	-
1979	9.23	23.61	0.09	6.21	0.08
1980	9.61	24.64	0.10	6.72	0.06
1981	9.06	23.42	0.11	6.78	0.32
1982	9.47	24.49	0.12	8.46	-
1983	9.27	23.98	0.10	8.77	0.26
1984	8.96	23.38	0.07	5.95	0.26
1985	8.38	22.32	0.07	5.73	0.16
1986	7.70	19.62	0.09	8.33	0.24
1987	6.94	17.77	0.05	7.17	0.22
1988	6.57	16.94	0.08	6.06	0.19
1989	6.22	16.01	0.04	6.16	0.02
1990	5.54	14.29	0.06	5.59	0.14

NOTE: See Appendix B for methods.

SOURCE: National Center for Health Statistics multiple cause of death data tapes.
U.S. Bureau of the Census: 1970-1990 population estimates of the U.S.

- indicates no deaths listed.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-8. Coal workers' pneumoconiosis: years of potential life lost to age 65, U.S. residents age 15 and over, by race and sex, 1968-1990

Year	Total	White		Black	
		Males	Females	Males	Females
1968	2,900	2,835	10	50	5
1969	2,535	2,445	20	70	-
1970	3,960	3,850	35	75	0
1971	4,885	4,705	35	115	25
1972	6,190	6,000	0	190	-
1973	5,405	5,175	25	205	0
1974	5,710	5,510	25	140	35
1975	4,880	4,620	75	185	-
1976	4,345	4,150	5	190	0
1977	3,630	3,300	85	155	90
1978	3,100	2,885	65	150	-
1979	3,115	2,985	25	90	0
1980	3,280	3,165	35	80	0
1981	2,690	2,465	105	90	30
1982	2,500	2,360	40	100	-
1983	2,605	2,390	35	170	10
1984	2,390	2,305	5	55	15
1985	2,100	2,050	20	30	0
1986	1,850	1,790	5	45	10
1987	1,785	1,665	40	60	15
1988	1,450	1,365	10	70	5
1989	1,365	1,260	0	90	0
1990	1,200	1,145	0	25	5

NOTE: See Appendix B for methods.

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

- indicates no deaths listed.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-9. Coal worker's pneumoconiosis: years of potential life lost to life expectancy, U.S. residents age 15 and over, by race and sex, 1968-1990

Year	Total	White		Black	
		Males	Females	Males	Females
1968	20,868	18,037	159	334	18
1969	18,048	15,640	75	372	-
1970	27,106	23,063	141	540	14
1971	31,657	26,676	258	601	34
1972	36,580	30,842	151	861	-
1973	33,762	28,193	232	906	23
1974	35,186	29,411	273	891	44
1975	34,964	28,831	380	894	-
1976	31,941	26,274	207	978	14
1977	29,989	24,434	318	873	110
1978	28,517	23,381	223	800	-
1979	30,898	25,360	188	707	14
1980	31,913	26,639	197	693	8
1981	30,820	25,416	286	739	72
1982	32,983	27,031	245	897	-
1983	32,021	26,183	191	1,146	59
1984	31,624	26,422	146	680	60
1985	29,767	24,784	144	652	34
1986	27,772	22,977	206	808	49
1987	25,545	21,164	146	732	45
1988	24,244	20,114	168	625	37
1989	23,663	19,772	83	676	7
1990	21,510	17,914	125	570	29

NOTE: See Appendix B for methods.

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

- indicates no deaths listed.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-10. Coal workers' pneumoconiosis: number of deaths, crude and age-adjusted mortality rates (per 1,000,000 population), total years of potential life lost (YPLL) , U.S. residents age 15 and over, by state, 1989-1990

State	Deaths	Rank	Crude mortality		Age-adjusted mortality		YPLL to age 65		YPLL to life expectancy	
			Rate	Rank	Rate	Rank	Years	Rank	Years	Rank
Alabama	62	8	10.05	8	4.20	9	10	17	542	9
Alaska	-	43	-	43	-	43	-	43	-	43
Arizona	10	23	1.89	23	0.96	23	15	15	112	22
Arkansas	13	20	3.82	14	1.31	18	0	23	116	21
California	35	11	0.82	33	0.54	31	80	7	458	11
Colorado	32	14	6.38	10	3.88	10	0	23	294	15
Connecticut	8	27	1.54	26	0.70	26	0	23	79	29
Delaware	5	31	4.79	13	2.42	13	0	23	45	34
District of Columbia	-	43	-	43	-	43	-	43	-	43
Florida	60	9	2.90	17	1.18	21	45	10	668	8
Georgia	11	21	1.12	30	0.80	25	0	23	134	20
Hawaii	-	43	-	43	-	43	-	43	-	43
Idaho	-	43	-	43	-	43	-	43	-	43
Illinois	87	6	5.00	12	2.73	12	100	6	991	6
Indiana	46	10	5.42	11	2.85	11	70	8	526	10
Iowa	15	19	3.50	15	1.33	17	0	23	141	19
Kansas	6	30	1.59	25	1.03	22	40	12	104	24
Kentucky	252	4	44.35	3	26.06	3	320	4	3,084	4
Louisiana	4	33	0.64	38	0.54	31	55	9	103	25
Maine	1	40	0.53	39	0.35	38	0	23	14	39
Maryland	17	18	2.30	20	1.56	15	15	15	208	17
Massachusetts	3	35	0.32	42	0.11	42	0	23	26	36
Michigan	35	11	2.48	19	1.21	20	5	20	332	13
Minnesota	-	43	-	43	-	43	-	43	-	43
Mississippi	2	37	0.52	40	0.28	40	0	23	22	37
Missouri	11	21	1.39	27	0.59	29	0	23	107	23
Montana	-	43	-	43	-	43	-	43	-	43
Nebraska	-	43	-	43	-	43	-	43	-	43
Nevada	2	37	1.10	31	0.60	28	0	23	14	39
New Hampshire	-	43	-	43	-	43	-	43	-	43
New Jersey	33	13	2.76	18	1.53	16	45	10	398	12
New Mexico	7	29	3.48	16	1.89	14	0	23	67	32
New York	22	17	0.80	34	0.33	39	5	20	197	18
North Carolina	23	16	2.24	21	1.31	18	10	17	256	16
North Dakota	2	37	2.12	22	0.81	24	0	23	17	38
Ohio	169	5	10.09	7	5.64	7	105	5	1,956	5
Oklahoma	8	27	1.77	24	0.65	27	0	23	69	31
Oregon	3	35	0.70	36	0.46	34	25	14	60	33
Pennsylvania	2,112	1	112.22	2	49.54	2	675	1	21,901	1
Rhode Island	-	43	-	43	-	43	-	43	-	43
South Carolina	4	33	0.75	35	0.42	36	0	23	33	35
South Dakota	1	40	1.01	32	0.36	37	0	23	8	41
Tennessee	70	7	9.20	9	4.75	8	35	13	747	7
Texas	10	23	0.40	41	0.20	41	0	23	89	26
Utah	32	14	14.11	5	8.58	5	0	23	296	14
Vermont	1	40	1.15	29	0.51	33	0	23	8	41
Virginia	277	3	29.30	4	21.45	4	355	3	3,514	3
Washington	9	25	1.25	28	0.59	29	0	23	82	28
West Virginia	612	2	218.87	1	113.40	1	540	2	7,199	2
Wisconsin	5	31	0.67	37	0.44	35	10	17	70	30
Wyoming	9	25	13.61	6	7.82	6	5	20	84	27

NOTE: See Appendix B for methods.

SOURCE: National Center for Health Statistics multiple cause of death data tapes.
U.S. Bureau of the Census: 1989-1990 population estimates of the U.S.

- indicates no death listed.

COAL WORKERS' PNEUMOCONIOSIS

Mortality

Table 3-11. Coal workers' pneumoconiosis: proportionate mortality ratios (PMR), based on underlying cause of death, by usual occupation for selected states, 1985-1990

COC	Occupation	Number of deaths	PMR	95% confidence interval	
				LCL	UCL
616	Mining machine operators	719	100.90	93.60	108.61
613	Supervisors, extractive occupations	3	10.27	2.12	30.03
859	Miscellaneous material moving equipment operators	3	3.71	0.76	10.84
824	Locomotive operating occupations	4	2.96	0.81	7.57
783	Welders and cutters	10	2.16	1.04	3.98
849	Crane and tower operators	3	2.09	0.43	6.11
563	Brickmasons and stonemasons	4	1.61	0.44	4.13
518	Industrial machinery repairers	4	1.54	0.42	3.93
575	Electricians	8	1.51	0.65	2.98
869	Construction laborers	15	1.49	0.83	2.45
777	Miscellaneous machine operators, n.e.c.	8	1.37	0.59	2.69
779	Machine operators not specified	11	1.14	0.57	2.04
844	Operating engineers	4	1.11	0.30	2.84

COC - 1980 Census Occupation Code

n.e.c. - not elsewhere classified

LCL - lower confidence limit

UCL - upper confidence limit

NOTE: See Appendix B for methods and Appendix C for list of selected states.

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

COAL WORKERS' PNEUMOCONIOSIS

Black Lung Benefits

Table 3-12. Federal Black Lung Program: number of beneficiaries and total payments by the Social Security Administration and Department of Labor, 1980-1991

Year	Social Security Administration		Department of Labor	
	Total beneficiaries	Total amount (dollars)	Total beneficiaries	Total amount (dollars)
1980	399,477	1,032,000,000	139,073	813,205,000
1981	376,505	1,081,300,000	163,401	805,627,000
1982	354,569	1,076,000,000	173,972	784,085,000
1983	333,358	1,055,800,000	166,043	859,854,000
1984	313,822	1,038,000,000	163,166	873,932,000
1985	294,846	1,025,000,000	160,437	905,516,000
1986	275,783	971,000,000	156,550	629,075,000
1987	258,988	940,000,000	153,289	655,290,000
1988	241,626	904,000,000	149,156	656,689,000
1989	225,764	882,000,000	144,187	650,123,000
1990	210,678	863,400,000	138,491	626,521,000
1991	196,419	844,400,000	133,001	942,428,000

NOTE: The Social Security Administration (SSA) was assigned initial responsibility for administering the Black Lung benefits program. The Department of Labor (DOL) assumed responsibility for processing and paying claims on July 1, 1973. Most claims filed prior to July 1, 1973 remain within the jurisdiction of SSA, which also continues to be responsible for processing and paying claims filed by the survivors of these miners. The dollar amounts from the Department of Labor are for fiscal years.

SOURCE: 1992 Social Security Bulletin Annual Statistical Supplement, and Black Lung Benefits Act Annual Report on Administration of the Act During Calendar Year 1991.

- Early participation in the Coal Workers' X-ray Surveillance Program (CWXP) was high due to industry employment levels, awareness of health and safety issues, and program visibility. Since 1980 reduced coal mining employment, reduced program visibility and concern for job security have resulted in reduced participation.

- See Appendix A for information on CWXP.

- See Table 3-13 for data.

- CWP prevalence shows declines from the mid-70's to mid-80's in all groups with at least 10 years tenure. Declines were over 50% in miners with 15-24 years tenure. Lack of continued decline in recent years is noted.

- See Table 3-13 for data.

Figure 3-5. CWXP: estimated number of actively employed underground coal miners and number examined, 1970-1991

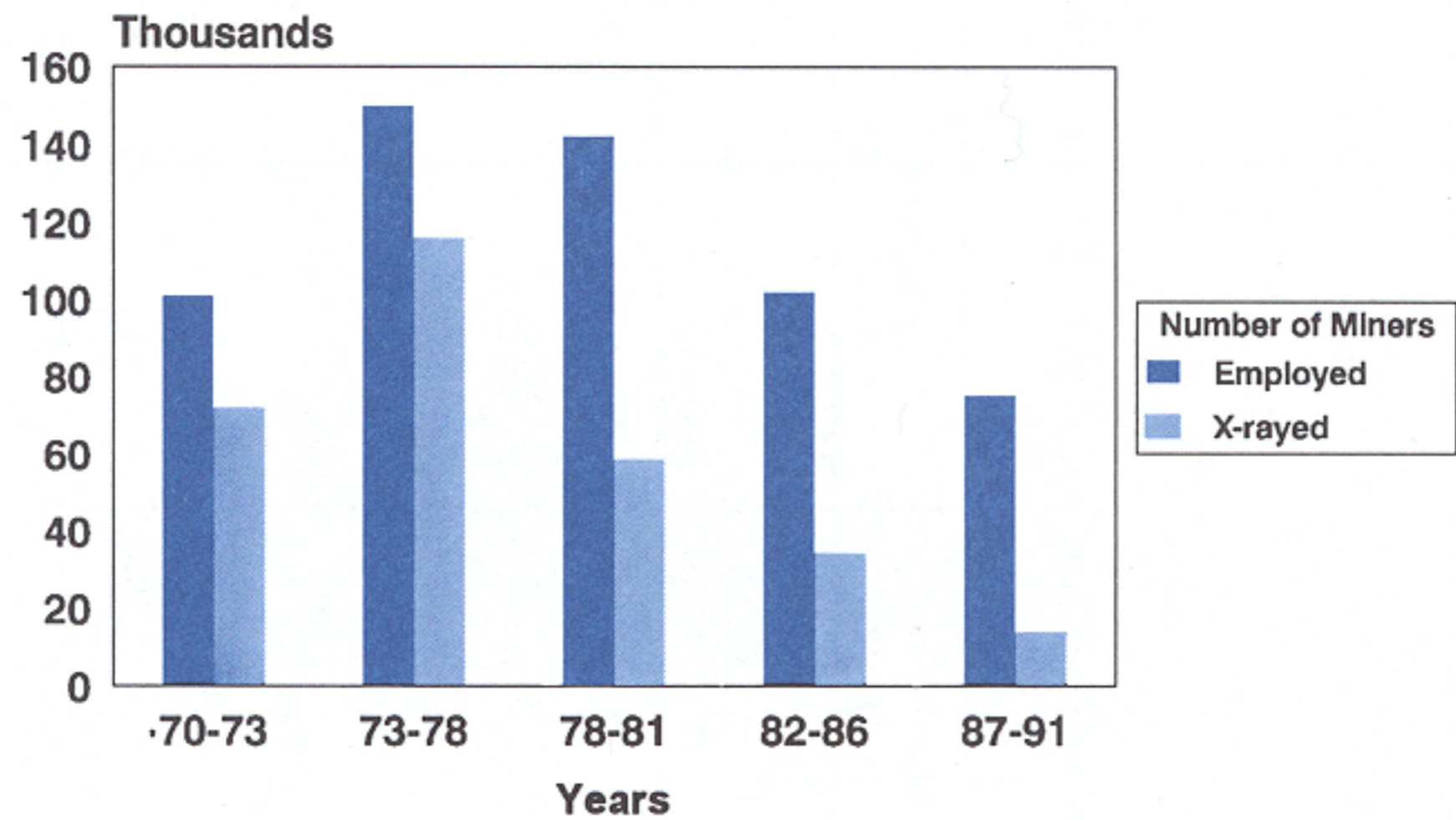
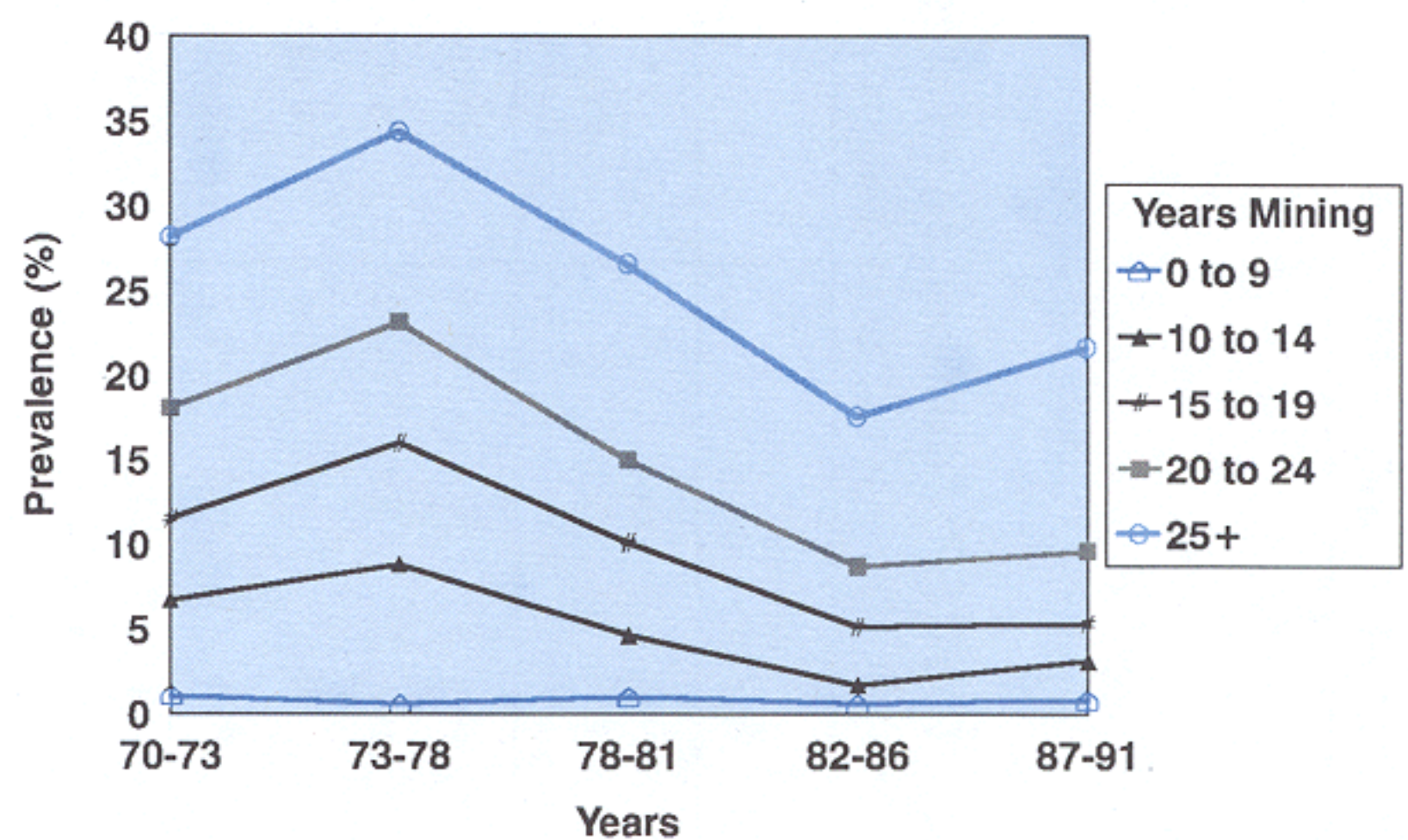


Figure 3-6. CWXP: percentage of examined miners with CWP (category 1/0 +), by tenure in mining, 1970-1991



COAL WORKERS' PNEUMOCONIOSIS

Morbidity

Table 3-13. CWXSP: number and percentage of examined miners with coal workers' pneumoconiosis, (category 1/0+), by round and tenure, 1970-1991

Tenure	Round 1 1970 - 1973			Round 2 1973 - 1978			Round 3 1978 - 1981			Round 4 1982 - 1986			Round 5 1987 - 1991		
	No. miners examined	No. Cat 1/0+	%	No. miners examined	No. Cat 1/0+	%	No. miners examined	No. Cat 1/0+	%	No. miners examined	No. Cat 1/0+	%	No. miners examined	No. Cat 1/0+	%
0	15,844	101	0.6	50,344	31	0.1	14,856	92	0.6	6,218	24	0.4	1,936	10	0.5
1	5,287	49	0.9	9,574	13	0.1	3,632	15	0.0	1,220	1	0.1	343	0	0.0
2-4	8,274	73	0.9	18,433	137	0.7	12,128	112	0.1	5,539	32	0.6	1,023	5	0.5
5-9	6,706	182	2.7	13,527	386	2.8	14,018	218	1.6	9,733	71	0.7	2,605	30	1.2
10-14	4,451	298	6.7	5,284	466	8.8	5,185	236	4.6	6,539	113	1.7	3,979	122	3.1
15-19	4,743	546	11.5	3,376	540	16.0	2,133	215	10.1	2,130	109	5.1	2,222	118	5.3
20-24	7,279	1,321	18.1	3,218	746	23.2	1,508	227	15.0	840	73	8.7	750	72	9.6
25-29	6,260	1,369	21.9	4,438	1,280	20.8	1,286	260	20.2	543	75	13.8	247	51	20.6
30+	12,602	3,958	31.4	7,192	2,721	37.8	3,548	1,028	28.9	1,255	241	19.2	306	69	22.5
TOTAL	71,446	7,897	11.1	115,386	6,320	5.5	58,294	2,403	4.1	34,017	739	2.2	13,411	477	3.6

NOTE: Tabulations are based on one chest x-ray per round for each participating miner.
 Round 1: Jan. 1970 - July 1973;
 Round 2: Aug. 1973 - July 1978;
 Round 3: Aug. 1978 - Dec. 1981;
 Round 4: Jan. 1982 - Dec. 1986;
 Round 5: Jan. 1987 - Dec. 1991.

SOURCE: Examination Processing Branch, Division of Respiratory Disease Studies, NIOSH.

Table 3-14. Coal workers' pneumoconiosis: estimated number of discharges from short-stay nonfederal hospitals, 1970-1991

Year	Number of cases
1970	6,000
1971	8,000
1972	11,000
1973	13,000
1974	14,000
1975	17,000
1976	18,000
1977	18,000
1978	13,000
1979	18,000
1980	17,000
1981	14,000
1982	17,000
1983	22,000
1984	23,000
1985	18,000
1986	16,000
1987	17,000
1988	15,000
1989	11,000
1990	7,000
1991	11,000

NOTE: Number of discharges have been rounded. NCHS recommends that in statistical comparisons, estimates of less than 5,000 not be used and that estimates of 5,000 to 10,000 be used with caution.

SOURCE: National Center for Health Statistics National Hospital Discharge Survey.

COAL WORKERS' PNEUMOCONIOSIS

Workers at Risk in Mining

Table 3-15. Estimated number of workers with potential exposure to coal mine dust, by state, 1986-1991

State	1986	1987	1988	1989	1990	1991
Alabama	7,307	6,618	6,554	6,467	6,623	6,460
Alaska	106	105	100	98	94	100
Arizona	907	945	911	898	918	893
Arkansas	55	58	40	28	29	27
California	0	0	0	0	8	35
Colorado	2,245	1,805	1,884	2,026	2,119	1,832
Illinois	14,254	12,682	11,577	11,144	10,394	9,517
Indiana	4,482	4,261	3,912	3,820	4,088	3,858
Iowa	188	170	116	100	96	74
Kansas	140	122	115	140	148	112
Kentucky	36,170	34,675	32,919	31,396	32,267	28,377
Louisiana	55	56	56	69	76	79
Maryland	587	586	558	547	604	601
Missouri	1,131	1,042	871	659	617	580
Montana	997	936	957	950	952	958
New Mexico	1,676	1,556	1,412	1,306	1,475	1,542
New York	0	2	3	2	2	1
North Carolina	0	4	0	5	5	0
North Dakota	1,064	988	944	971	950	911
Ohio	8,685	7,838	6,792	6,619	6,278	5,276
Oklahoma	789	725	517	474	428	419
Pennsylvania	21,544	19,128	17,619	16,512	16,354	14,477
Tennessee	2,571	2,211	2,323	2,089	1,882	1,435
Texas	3,614	3,625	3,508	3,417	3,436	3,618
Utah	2,376	2,433	2,241	2,186	2,271	2,148
Virginia	13,800	13,130	12,484	11,239	11,436	10,825
Washington	762	740	748	756	742	598
West Virginia	33,535	30,430	30,064	29,752	30,558	28,638
Wyoming	4,291	4,013	4,048	4,060	4,176	4,259
Total workers employed by mine operators	163,331	150,884	143,273	137,730	139,026	127,650
Anthracite	2,841	2,373	2,281	2,120	2,159	2,075
Bituminous	160,490	148,517	140,992	135,610	136,866	125,570
Total workers employed by contractors	12,269	12,915	13,906	17,599	20,752	22,457
TOTAL	175,600	163,799	157,179	155,329	159,778	150,107

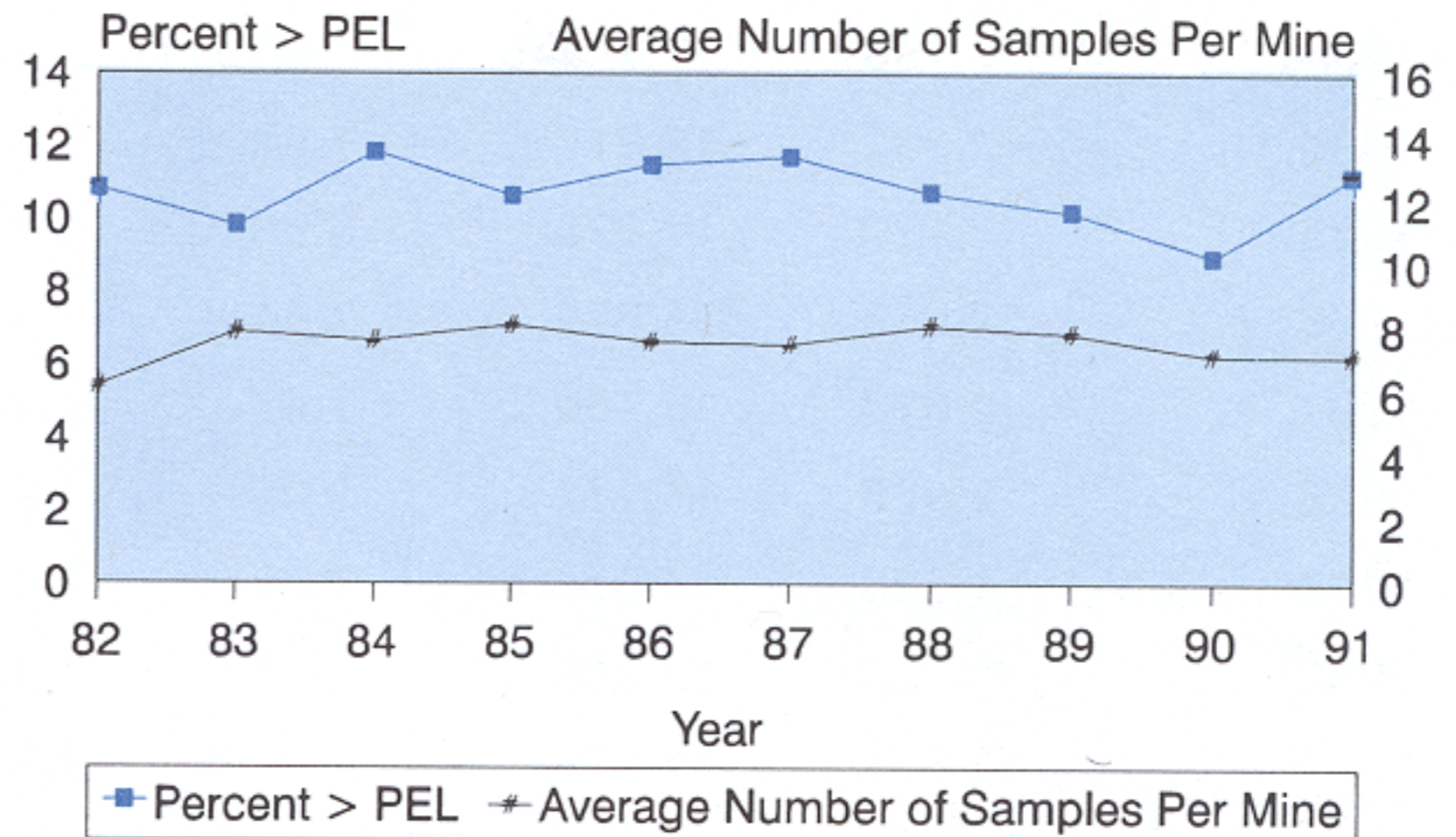
NOTE: Includes all coal mine employees except office workers.

SOURCE: U.S. Department of Labor, Mine Safety and Health Administration, Informational Report, Injury Experience in Coal Mining, 1986-1991.

- In the decade from 1982 to 1991, the average number of samples collected annually by MSHA inspectors per underground coal mine has ranged from 6.2 to 8.2, and the percent of samples exceeding the permissible exposure level (PEL) has ranged between 8 and 12%.

- See Table 3-16 for data.

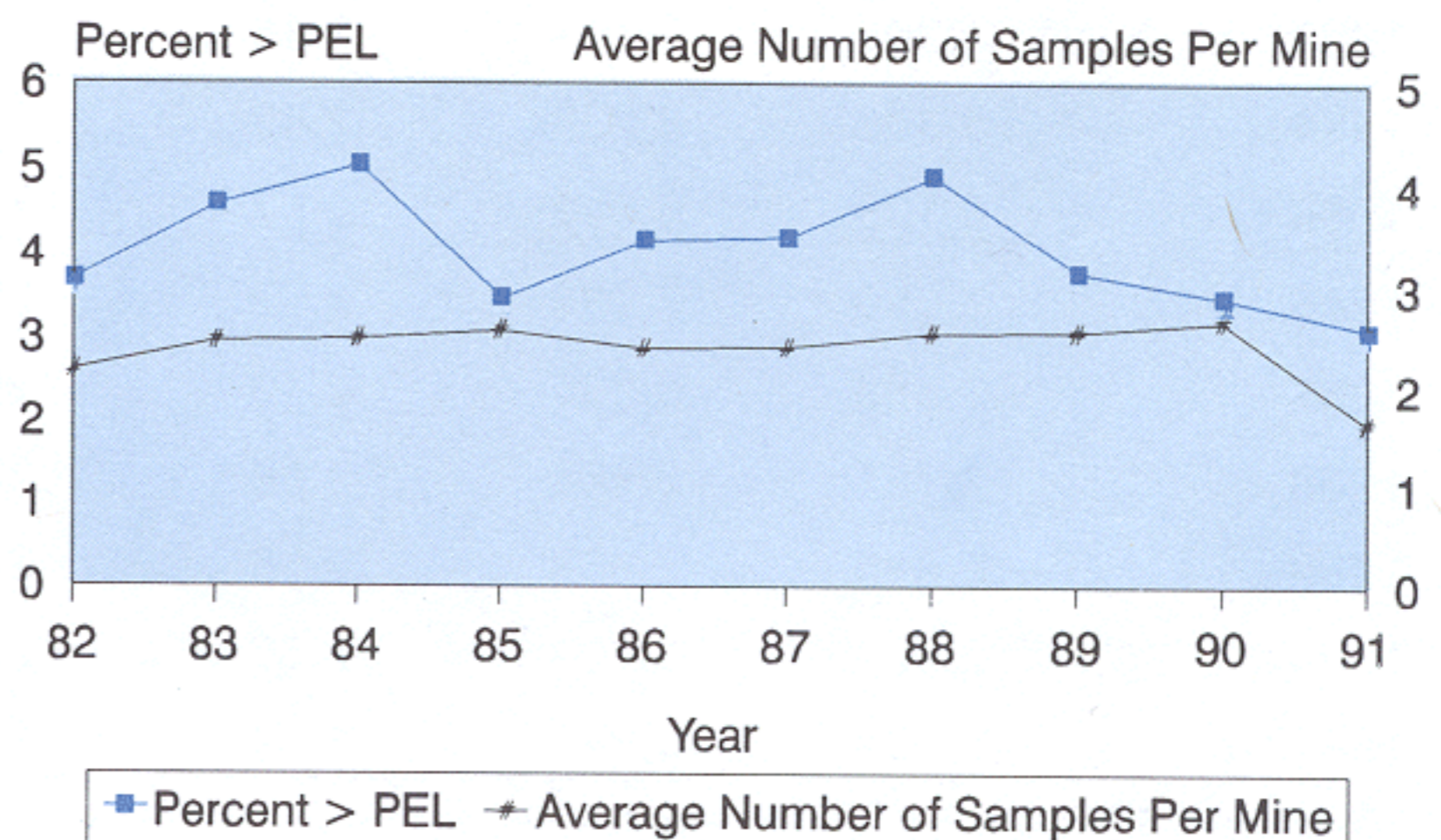
Figure 3-7. Respirable coal mine dust: average number of samples per mine collected by MSHA inspectors, and percent above PEL, U.S. underground coal mines, 1982-1991



- In the decade from 1982 to 1991, the average number of samples collected annually by MSHA inspectors per surface coal mine has ranged from 1.6 to 2.7 and the percent of samples exceeding the PEL has ranged between 3 and 5%.

- See Table 3-17 for data.

Figure 3-8. Respirable coal mine dust: average number of samples per mine collected by MSHA inspectors, and percent above PEL, U.S. surface coal mines, 1982-1991



COAL WORKERS' PNEUMOCONIOSIS

Exposure

Table 3-16. Respirable coal mine dust: number of samples collected by MSHA inspectors and percent exceeding various levels, U.S. underground coal mines, 1982-1991

Year	Number of active mines	Total number of samples	Average samples per mine	Samples > PEL	Percent of samples > PEL	Samples > 2x PEL	Percent of samples > 2x PEL
1982	2,743	16,893	6.16	1,806	10.69	373	2.21
1983	2,188	17,194	7.86	1,666	9.69	403	2.34
1984	2,232	16,917	7.58	1,977	11.69	476	2.81
1985	2,120	17,078	8.06	1,794	10.50	421	2.47
1986	2,065	15,575	7.54	1,768	11.35	359	2.30
1987	2,029	15,160	7.47	1,752	11.56	398	2.63
1988	1,923	15,472	8.05	1,638	10.59	339	2.19
1989	1,798	14,030	7.80	1,409	10.04	272	1.94
1990	1,796	12,766	7.11	1,123	8.80	239	1.87
1991	1,621	11,511	7.10	1,273	11.06	262	2.28

NOTE: The MSHA permissible exposure limit (PEL) for respirable coal mine dust is 2 mg/m³ MRE when not reduced due to quartz content. See Appendix A for additional information.

SOURCE: U.S. Department of Labor, Mine Safety and Health Administration (MSHA), Respirable coal mine dust data, 1982-1991.

Table 3-17. Respirable coal mine dust: number of samples collected by MSHA inspectors and percent exceeding various levels, U.S. surface coal mines, 1982-1991

Year	Number of active mines	Total number of samples	Average samples per mine	Samples > PEL	Percent of samples > PEL	Samples > 2x PEL	Percent of samples > 2x PEL
1982	4,118	8,955	2.17	327	3.65	99	1.11
1983	3,308	8,141	2.46	369	4.53	125	1.54
1984	3,306	8,239	2.49	411	4.99	96	1.17
1985	3,136	8,049	2.57	275	3.42	77	0.96
1986	3,050	7,298	2.39	299	4.10	80	1.10
1987	2,889	6,931	2.40	286	4.13	87	1.26
1988	2,751	6,988	2.54	339	4.85	96	1.37
1989	2,616	6,669	2.55	248	3.72	80	1.20
1990	2,524	6,704	2.66	229	3.42	62	0.92
1991	2,404	3,941	1.64	120	3.04	35	0.89

NOTE: The MSHA permissible exposure limit (PEL) for respirable coal mine dust is 2 mg/m³ MRE when not reduced due to quartz content. See Appendix A for additional information.

SOURCE: U.S. Department of Labor, Mine Safety and Health Administration (MSHA), Respirable coal mine dust data, 1982-1991.