

DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
SCOTT TURNER, DIRECTOR

REPORT OF INVESTIGATIONS

COAL-MINE FATALITIES IN MAY, 1931



BY

W. W. ADAMS AND L. CHENOWETH

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By W. W. Adams² and L. Chenoweth³

Accidents in the coal mines of the United States during the month of May, 1931, caused the death of 105 men, according to reports received from State mine inspectors by the United States Bureau of Mines, Department of Commerce. This was a reduction of 16 from the 121 fatalities reported for the previous month of April, and a reduction of 43 from the 148 deaths which occurred in May, 1930. It is gratifying to note that, while the production of coal in May declined 3 per cent from the April output, the number of deaths was reduced 13 per cent. Comparing May, 1931, with the same month last year, the number of deaths decreased 29 per cent, while production of coal decreased only 20 per cent. There were 33,319,000 tons of coal mined in May of the present year, as compared with 34,178,000 tons in April, 1931, and 41,865,000 tons in May, 1930. The death rates⁴ based on these figures were 3.15 per million tons of coal produced for the present month, as compared with 3.54 for April, 1931, and 3.54 for May, 1930.

Considering bituminous mines alone, a lower death rate was shown in May, 1931; than in either the corresponding month last year or in April of the present year, the rate being 2.44 per million tons, based on 69 deaths and 28,314,000 tons, as compared with 3.17 a year ago, based on 114 deaths and 35,954,000 tons, and 2.74 for April, 1931, based on 78 fatalities and 28,478,000 tons.

The anthracite mines in Pennsylvania had a death rate of 7.19 per million tons of coal in May, 1931, as compared with 5.75 for May a year ago and 7.54 for April, 1931. These rates were based on 36 deaths and 5,005,000 tons in May of the present year; 43 deaths and 5,700,000 tons in April, 1931; and 34 fatalities and 5,911,000 tons in May, a year ago.

During the first five months of the current year, 634 lives were lost in the mining of 187,610,000 tons of coal in the United States. This indicates a death rate of 3.38 per million tons, an improvement over the record of a year ago when 877 men were killed and 225,358,000 tons of coal were produced, with a death rate of 3.89. Separated into bituminous and anthracite, the records for the first five months of 1931, were 2.78 and 6.93, respectively, for bituminous and anthracite mines, whereas those for the corresponding period in 1930 were 3.50 and 6.61, respectively.

1 The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Report of Investigations 3136."

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4 Death rates in this paper are based on tonnage rather than on number of men employed, as the latter item is not reported monthly to the U. S. Bureau of Mines.

One major disaster--that is, a disaster in which five or more lives were lost--occurred during May of the present year. This was an explosion at Mt. Carmel, Pa., which resulted in five deaths. The period from January to May, 1931, showed 4 major disasters which resulted in the loss of 46 lives; for the same period in 1930 there were 7 major disasters and 88 deaths. Based exclusively on these disasters, the death rates were 0.245 for 1931 and 0.390 for 1930. The major disasters thus far in 1931 occurred at the rate of 2.13 separate disasters (as distinguished from the number of deaths resulting from the disasters) for each hundred-million tons of coal mined, as compared with 3.11 for the corresponding period in 1930.

Comparing the accident record for the first five months of 1931 with that for 1930, a reduction is noted in the death rates from falls of roof and coal, haulage, gas or dust explosions, explosives, and electricity, which are the principal causes of fatalities in coal mines. The comparative rates are as follows:

Cause	Year 1930		Jan.-May 1930		Jan.-May 1931	
	Fatality		Fatality		Fatality	
	Killed	rate	Killed	rate	Killed	rate
All causes	2,014	3.798	877	3.892	634	3.379
Falls of roof and coal..	1,067	2.012	462	2.050	355	1.892
Haulage	303	.572	146	.648	106	.565
Gas or dust explosions:						
Local explosions	61	.115	34	.151	5	.027
Major explosions	214	.404	85	.377	46	.245
Explosives	78	.147	31	.137	21	.112
Electricity	76	.143	33	.147	22	.117
Miscellaneous	215	.405	86	.382	79	.421

Tables 1 to 6 present a detailed statistical comparison of the number and causes of accidents and the corresponding death rates per million tons in May, 1931, with similar figures for earlier periods. Table 7 gives a list of major disasters in the coal mines of the United States during the year 1930 and for the first five months of 1931. Table 8 gives the number of fatalities in the coal mines of Great Britain, from January to May, 1931.

HAULAGE ACCIDENTS: During the 5-year period 1925 to 1929, deaths from haulage accidents in underground operations at coal mines in the United States occurred at an annual rate of 0.379 for each million man-hours of work performed by the underground employees. The rates for mines in certain individual States were more favorable than this average for the whole country, while the rates for certain other States were considerably less favorable than the country's average. A comparison of the rate for each State with that for the United States as a whole, and the relative standing of all States during the 5-year period are shown in Figure 1.

TABLE 1 - NUMBER OF DEATHS, BY CAUSES OF ACCIDENTS,
AT ALL COAL MINES IN THE UNITED STATES

R.I. 3136.

(Includes both anthracite and bituminous coal)

Cause	1930	1931					Jan.-May
	Jan.-May	Jan.	Feb.	Mch.	Apr.	May	
Falls of Roof & Coal	462	86	66	67	76	60	355
At face	316	67	49	48	61	30	255
In room	77	10	9	12	8	17	56
On entry	68	9	8	7	7	8	39
On slope	1	-	-	-	-	5	5
Haulage	146	25	19	23	19	20	106
Switching and spragging	3	1	1	-	-	-	2
Coupling	12	1	1	-	-	-	2
Falling from trips.....	5	-	-	3	-	1	4
Run over	57	8	7	9	8	6	38
Caught between car and rib	38	9	7	5	6	6	33
Caught between car and roof	8	-	2	1	2	1	6
Runaway cars	14	4	-	1	1	3	9
Miscellaneous	9	2	1	4	2	3	12
Gas or Dust Explosions	119	44	-	1	1	5	51
Open flame lamp	26	28	-	-	1	-	29
Matches or smoking		-	-	-	-	-	-
Defective safety lamp	-	-	-	-	-	-	-
Electric arc	32	-	-	-	-	-	-
Blasting	31	5	-	-	-	-	5
Miscellaneous	30	11	-	1	-	5	17
Explosives	31	2	4	4	6	5	21
Transportation	3	-	-	-	-	-	-
Charging	1	-	-	1	-	-	1
Suffocation	-	-	-	-	-	-	-
Drilling into old holes	4	-	-	-	-	-	-
Striking in loose rock	2	-	-	-	-	-	-
Thawing	-	-	-	-	-	-	-
Caps & detonators	-	-	-	-	-	-	-
Unguarded shots	2	-	-	-	1	-	1
Returned too soon	2	-	-	-	-	-	-
Premature shots	11	2	2	2	2	5	13
Sparks from lamp, etc.	2	-	-	1	1	-	2
Delayed shots	1	-	2	-	-	-	2
Shot breaking through rib	1	-	-	-	-	-	-
Miscellaneous	2	-	-	-	2	-	2
Electricity	33	3	4	4	6	5	22
Direct contact with trolley wire	17	3	2	2	1	1	9
Tools striking trolley wire	1	-	-	-	-	-	-
Contact with mining machine	4	-	1	-	2	1	4
Contact with machine feed wire..	3	-	-	-	1	-	1
Contact with haulage motor	-	-	-	-	-	-	-
Miscellaneous	8	-	1	2	2	3	8
Miscellaneous	86	20	19	17	13	10	79
Total	877	180	112	116	121	105	634

TABLE 2 - DEATH RATES, BY CAUSES OF ACCIDENTS, PER MILLION TONS OF
COAL PRODUCED AT ALL COAL MINES IN THE UNITED STATES
(Includes both anthracite and bituminous coal)

Cause	Year 1930	Jan.-May 1930	Jan.-May 1931
Falls of Roof & Coal	2.012	2.050	1.892
At face	1.422	1.402	1.359
In room .....	.296	.342	.298
On entry .....	.271	.302	.208
On slope .....	.023	.004	.027
Haulage .....	.572	.648	.565
Switching and spragging .....	.007	.013	.011
Coupling .....	.038	.053	.011
Falling from trips .....	.021	.022	.021
Run over .....	.234	.253	.202
Caught between car and rib .....	.128	.169	.176
Caught between car and roof .....	.034	.036	.032
Runaway cars .....	.072	.062	.048
Miscellaneous .....	.038	.040	.064
Gas or Dust Explosions .....	.519	.528	.272
Open flame lamp .....	.070	.116	.154
Matches or smoking			- -
Defective safety lamp			- -
Electric arc .....	.223	.142	- -
Blasting .....	.072	.137	.027
Miscellaneous .....	.147	.133	.091
Explosives .....	.147	.137	.112
Transportation .....	.007	.013	- -
Charging .....	.004	.004	.005
Suffocation .....	.004	- -	- -
Drilling into old holes .....	.023	.018	- -
Striking in loose rock .....	.004	.009	- -
Thawing	- -	- -	- -
Caps & detonators .....	.006	- -	- -
Unguarded shots .....	.015	.009	.005
Returned too soon .....	.013	.009	- -
Premature shots .....	.045	.049	.069
Sparks from lamp, etc. ....	.006	.009	.011
Delayed shots .....	.004	.004	.011
Shot breaking through rib .....	.009	.004	- -
Miscellaneous .....	.007	.009	.011
Electricity .....	.143	.147	.117
Direct contact with trolley wire.	.073	.076	.048
Tools striking trolley wire .....	.004	.004	- -
Contact with mining machine .....	.017	.018	.021
Contact with machine feed wire ..	.015	.013	.005
Contact with haulage motor .....	.002	- -	- -
Miscellaneous .....	.032	.036	.043
Miscellaneous .....	.405	.382	.421
Total	3.798	3.892	3.379

TABLE 3 - COAL-MINE FATALITIES IN THE UNITED STATES IN MAY, 1931, BY CAUSES AND STATES

Cause	Ala	Alas	Ark	Col	Ill	Ind	Ia	Kan	Ky	Md	Mch	Mo	Mnt	NMx	NDk	O	Ok	Pa Bit	Tenn	Tex	Ut	Va	Wsh	WVa	Wyo	TOTAL BITUM	Pa anth	GRAND TOTAL	
<u>UNDERGROUND</u>																													
Falls of roof	-	-	-	1	7	1	1	-	6	-	-	-	-	1	-	2	-	6	4	-	-	-	-	7	-	36	13	49	
Falls of side	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	7	4	11	
Haulage	2	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-	5	-	-	-	-	1	4	-	15	5	20	
Gas or dust explosions ...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	
Explosives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	4	5
Suffocated by mine gases..	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	5
Electricity	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	5	-	5	
Animals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mining machines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mine fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other causes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	
Total	2	-	-	1	8	2	3	-	7	1	-	-	-	1	-	3	-	11	4	-	-	-	2	19	-	64	34	98	
<u>SHAFT</u>																													
Persons falling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Objects falling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cages, skips	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other causes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>SURFACE</u>																													
Mine cars	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	1	3	
Electricity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	
Machinery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boiler explosions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Railway cars	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	2	
Other causes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	4	-	5	2	7	
GRAND TOTAL, MAY, 1931 ...	2	0	0	1	8	2	3	0	7	1	0	0	0	1	0	3	0	12	4	0	0	0	2	23	0	69	36	105	
GRAND TOTAL, MAY, 1930 ...	3	0	0	4	11	0	1	0	17	1	0	1	0	1	1	9	1	31	3	0	0	1	0	28	1	114	34	148	

TABLE 4 - COAL-MINE FATALITIES DURING 1931, BY MONTHS AND STATES

MONTH	Ala	Alas	Ark	Col	Ill	Ind	Ia	Kan	Ky	Md	Mch	Mo	Mnt	NMx	NDk	O	Ok	Pa bit	Tenn	Tex	Ut	Va	Wash	WVa	Wyo	TOTAL BITUM	Pa anth	GRAND TOTAL
January	2	-	-	4	9	31	1	-	7	1	-	3	-	-	-	9	-	20	3	-	2	1	2	43	1	139	41	180
February	2	-	-	1	8	2	1	1	8	-	-	-	-	-	-	4	1	20	1	-	1	2	-	16	2	70	42	112
March	2	-	-	3	5	2	-	1	11	-	-	-	1	-	-	10	-	14	-	-	2	2	1	34	3	91	25	116
April	1	-	1	2	7	-	-	1	6	-	-	-	1	1	-	3	-	17	1	-	-	4	-	32	1	78	43	121
May	2	-	-	1	8	2	3	-	7	1	-	-	-	1	-	3	-	12	4	-	-	-	2	23	-	69	36	105
TOTAL, 5 MONTHS, 1931.	9	0	1	11	37	37	5	3	39	2	0	3	2	2	0	29	1	83	9	0	5	9	5	148	7	447	187	634
TOTAL, 5 MONTHS, 1930.	31	0	2	20	49	9	10	6	97	4	0	5	2	3	2	37	7	129	8	0	42	19	19	180	8	689	188	877
TOTAL, YEAR 1930.	61	0	9	36	112	22	19	10	179	6	1	9	3	14	3	154	65	299	21	0	57	39	23	410	22	1,574	440	2,014

R.I. 3136.

TABLE 5 - COAL-MINE FATALITIES IN 1931, BY MONTHS, AND CAUSES OF ACCIDENTS

CAUSE	1931						1930
	Jan.	Feb.	Mch.	Apr.	May	Total	Jan.-May
<u>UNDERGROUND</u>							
Falls of roof	66	54	56	64	49	289	403
Falls of side	20	12	11	12	11	66	59
Haulage	25	19	23	19	20	106	146
Gas or dust explosions	44	--	1	1	5	51	119
Explosives	2	4	4	6	5	21	31
Suffocated by mine gases	--	1	2	1	1	5	6
Electricity	3	4	4	6	5	22	33
Animals	1	1	--	1	--	3	3
Mining machines	3	2	1	1	--	7	7
Mine fires	--	--	--	--	--	--	5
Other causes	5	9	6	3	2	25	24
TOTAL	169	106	108	114	98	595	836
<u>SHAFT</u>							
Persons falling	3	1	1	--	--	5	2
Objects falling	1	--	--	--	--	1	1
Cages, skips	--	--	--	--	--	--	4
Other causes	--	--	--	--	--	--	1
TOTAL	4	1	1	--	--	6	8
<u>SURFACE</u>							
Mine cars	2	--	2	1	3	8	8
Electricity	--	--	1	1	1	3	4
Machinery	2	--	1	1	--	4	4
Boiler explosions	--	--	1	--	--	1	--
Railway cars	--	1	2	1	2	6	7
Other causes	3	4	--	3	1	11	10
TOTAL	7	5	7	7	7	33	33
GRAND TOTAL	180	112	116	121	105	634	877

TABLE 6 - AVERAGE NUMBER OF MEN KILLED PER MILLION TONS OF COAL PRODUCED IN THE UNITED STATES
IN MAY, 1931, AND EARLIER PERIODS

Cause of accident	Per cent of total 1921-1930	Death rates per million short tons						
		Average for 10 years 1921-1930	Year		Average for May 10 years 1921-1930	1931		
			1929	1930		May	Apr.	May
Bituminous Mines								
1. Falls of roof and coal	49.72	1.756	1.724	1.820	1.741	1.919	1.967	1.518
2. Underground haulage	17.58	.621	.651	.574	.706	.751	.421	.530
3. Explosions of gas or coal dust:								
Local explosions	2.24	.079	.043	.052	.064	.084	--	--
Major explosions	13.58	.479	.271	.484	.907	--	--	--
4. Explosives	2.84	.100	.084	.069	.089	.084	.070	.035
5. Electricity	4.43	.157	.140	.149	.187	.139	.211	.177
6. Mining machines	1.43	.051	.052	.050	.076	--	.035	--
7. Other causes underground	2.33	.082	.054	.080	.050	.027	--	--
8. All causes underground	94.15	3.325	3.019	3.258	3.820	3.004	2.704	2.260
9. All shaft accidents	1.33	.047	.032	.035	.022	.056	--	--
10. All accidents on surface	4.52	.160	.136	.117	.159	.111	.035	.177
11. All accidents	100.00	3.532	3.137	3.410	4.001	3.171	2.739	2.437
Anthracite Mines								
1. Falls of roof and coal	47.16	2.788	3.522	3.271	2.694	2.876	3.509	3.397
2. Underground haulage	12.58	.744	.880	.548	.681	.339	1.228	.999
3. Explosions of gas:								
Local explosions	7.24	.428	.366	.533	.355	.169	.175	--
Major explosions	1.84	.109	--	--	.429	--	--	.999
4. Explosives	10.85	.642	.582	.663	.488	.169	.702	.799
5. Electricity	1.12	.066	.081	.101	.059	--	--	--
6. Other causes underground	8.29	.490	.420	.634	.799	1.184	.877	.599
7. All causes underground	89.08	5.267	5.851	5.750	5.505	4.737	6.491	6.793
8. All shaft accidents	1.91	.113	.163	.029	.133	--	--	--
9. All accidents on surface	9.01	.533	.515	.562	.296	1.015	1.053	.400
10. All accidents	100.00	5.913	6.529	6.341	5.934	5.752	7.544	7.193

TABLE 7 - COAL-MINE FATALITIES IN THE UNITED STATES IN WHICH FIVE OR MORE MEN WERE
KILLED DURING 1930 AND 1931

Date	Name of Mine	Location of Mine	Nature of accident	Alleged cause of ignition	Killed
1930:					
Jan. 13	Peerless	Straven, Ala.	Gas or dust explosion	Electric arc ...	7
Jan. 19	No. 1	Lillybrook, W. Va. ..	"	Not stated	8
Feb. 6	Standard	Standardville, Utah .	"	Electric arc ...	<u>1/</u> 23
Mch. 8	New Peerless	Lynn, Utah	"	Electric arc ...	5
Mch. 26	Yukon	Arnettville, W. Va..	"	Not stated	12
Mch. 30	Kettle Island	Kettle Island, Ky. ..	"	Open-flame lamp.	16
Apr. 12	Carbonado	Carbonado, Wash.	"	Blasting	17
Aug. 8	Gilberton Colliery <u>2/</u> .	Gilberton, Pa.	Fall of roof	-	8
Oct. 27	Wheatley #4	McAlester, Okla.	Gas or dust explosion	Not stated	30
Nov. 5	No. 6	Millfield, Ohio	"	Electric arc ...	<u>3/</u> 79
Nov. 29	Lutie No. 5	Wilburton, Okla.	"	Not stated	15
Dec. 6	Lamb	Madrid, N. Mex.	"	Electric arc ...	5
1931:					
Jan. 3	Midvale #4	Midvale, Ohio	Gas or dust explosion	Blasting	5
Jan. 6	Glen Rogers	Beckley, W. Va.	"	Not stated	8
Jan. 28	Little Betty	Dugger, Ind.	"	Open flame lamp.	28
May 29	Richards Colliery <u>2/</u> .	Mt. Carmel, Pa.	"	Not stated	5

1/ Includes 3 killed by fall of slate about 28 hours later.

2/ Anthracite mine.

3/ Does not include 3 visitors, in no way connected with mining.

R.I. 3136

TABLE 8 - GREAT BRITAIN; FATALITIES IN MINES UNDER THE COAL MINES REGULATION ACT, JANUARY TO MAY, 1931 (1)

Cause	January	February	March	April	May	Jan.-May
Underground:						
By explosions of firedamp or coal dust	33	--	--	1	2	36
By falls of ground	36	35	40	46	31	188
Shaft accidents	1	1	1	3	2	8
Haulage accidents	12	14	17	18	13	74
Miscellaneous	7	6	4	13	4	34
Total underground	89	56	62	81	52	340
Surface:						
On railways, sidings and tramways	4	2	5	2	2	15
Other surface accidents	1	4	3	6	2	16
Total surface	5	6	8	8	4	31
Grand total	94	62	70	89	56	371

(1) From the Ministry of Labour Gazette, London, England.

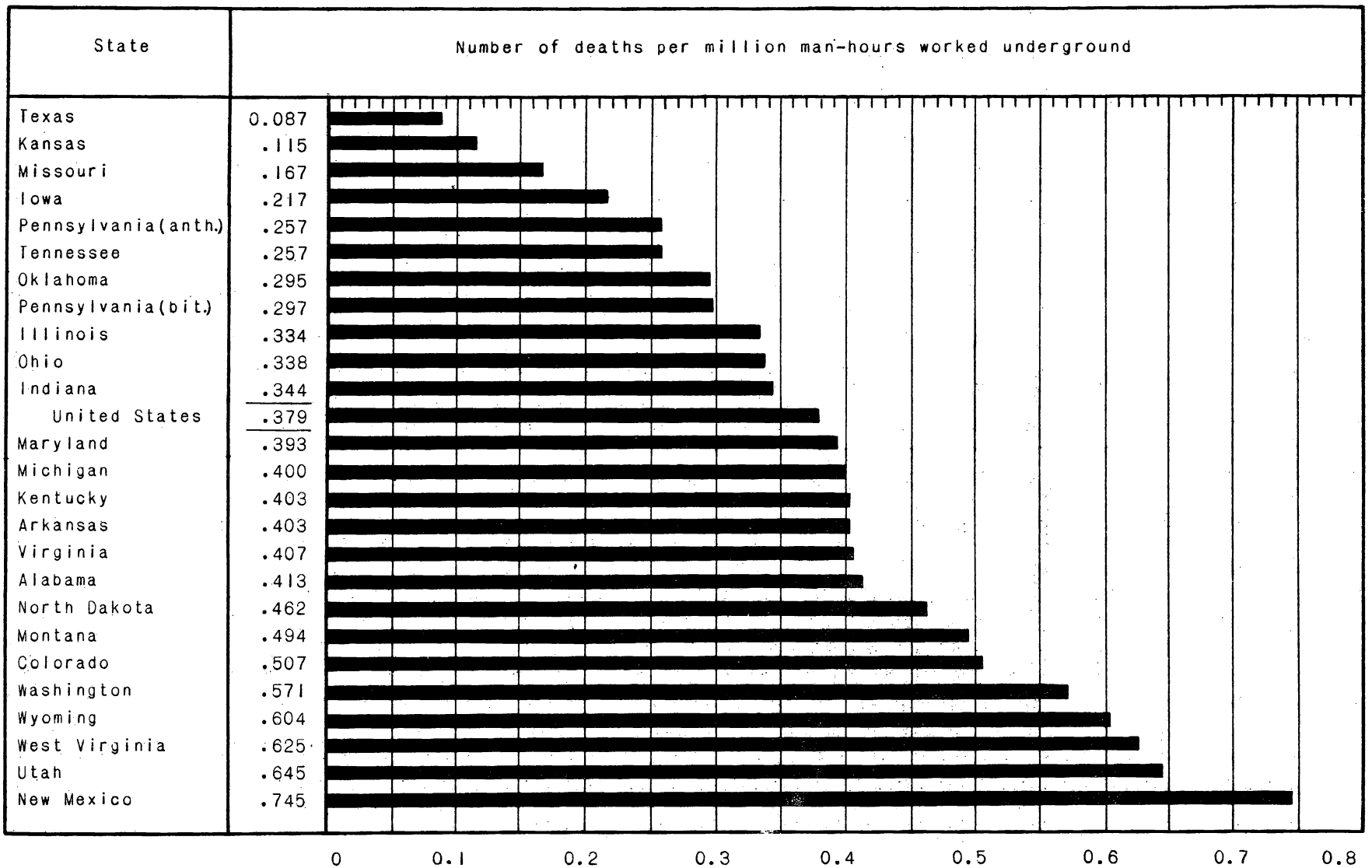


Figure 1.- Comparative fatality rates from haulage accidents underground at coal mines in the United States during the 5-year period, 1925 to 1929

