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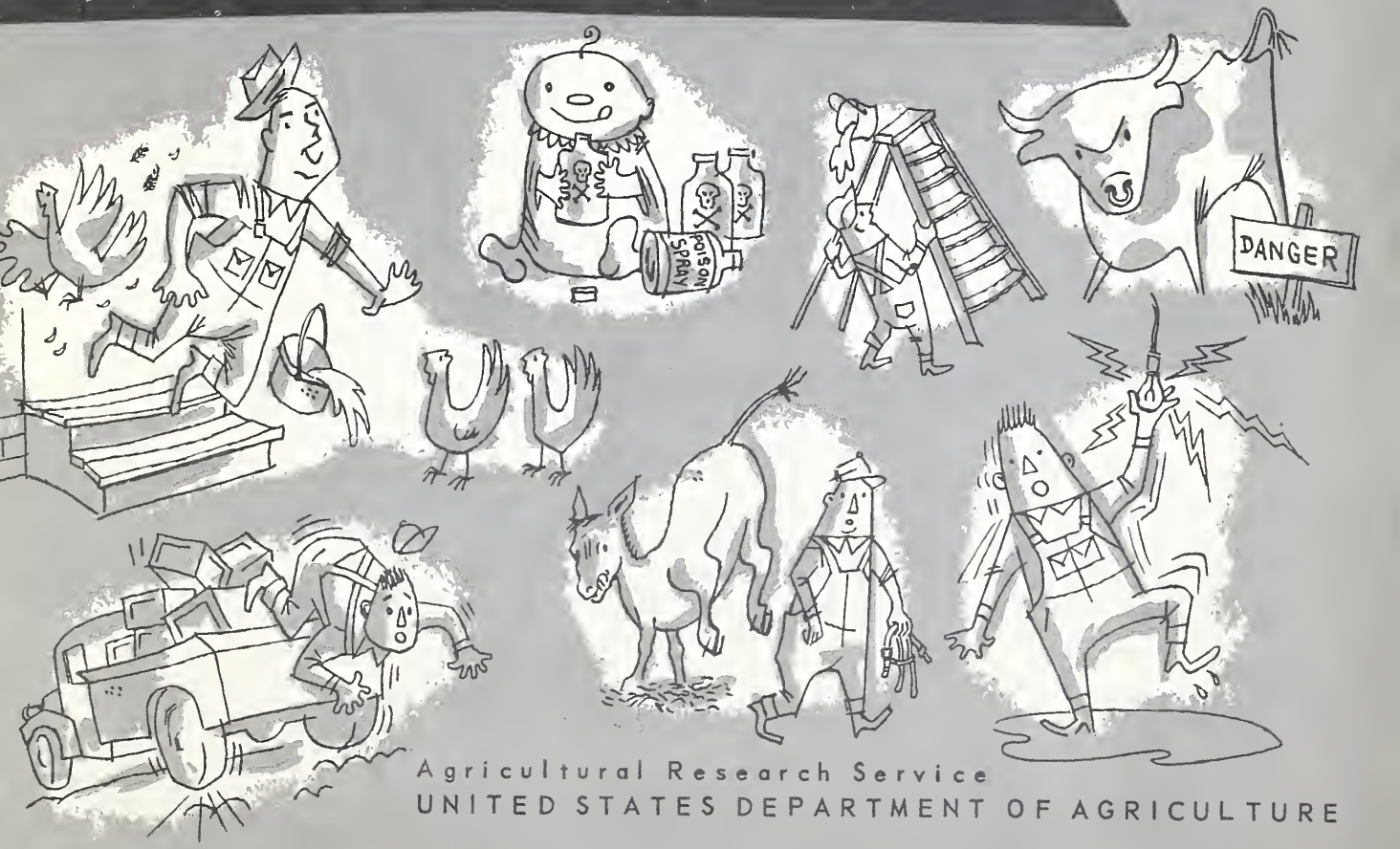
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FATAL FARM

ACCIDENTS

in the U.S. 1949-53



Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

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FATAL FARM ACCIDENTS, UNITED STATES, 1949-53

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This is the fourth in a series of analyses of fatal farm accidents made from data supplied by the National Office of Vital Statistics. 1/ The more recent data, which cover the years from 1949 to 1953, include some information on causes of accidents not previously available. It is hoped that these studies will provide a basis for a better understanding of the accident problem on farms.

The data now cover 14 years (1940-53). Altogether, they account for a total of 30,521 fatalities resulting from farm accidents. Because of a change in classification based on the Sixth Revision of the International Lists of Causes of Death, first used in 1949, there is a change in the comparability of the data as between the first and the latter parts of the series. 2/ Essentially, the change is in the direction of tabulating as fully as possible all fatal accidents that occur on farmland and in and around farm service buildings. Therefore, data on fatal accidents in the farm home and away from the farm, are excluded. Because of this limitation of the data, additional sources were drawn upon to give the whole picture on accidents to farm people, including those that occur in the farm home and off the farm, and the nonfatal but disabling accidents.

1/ See Analysis of 7,851 Fatal Farm-Work Accidents in the United States, 1940-43, July 1945; Fatal Accidents in Farm-Work, September 1949; and Analysis of 17,906 Fatal Farm-Work Accidents in the United States, 1940-48, April 1951.

2/ The change in classification of farm-accident fatalities in the Sixth Revision of the International Lists of Causes of Death, first used in 1949, has broadened the base for the more nearly complete tabulation of the fatal accidents that occur on farms. Before the revision, farm-accident fatalities were tabulated basically from death certificates. The certificate describes the farming activity associated with the death, such as the use of farm machinery or the handling of farm animals. But beginning in 1949 fatal farm accidents were tabulated on the basis of a more complete account of events occurring on the farmland and in and around service buildings. This tended to bring in more fatal accidents to children and others not necessarily associated with some farming activity. Fatal accidents in the farm home and away from the farm, such as traffic accidents, were excluded in all these series.

FINDINGS

A little more than a fourth of the fatal accidents to farm people during 1949-53 occurred on the farm but outside the home. Far too many were young people who either had not acquired the skills necessary to avoid accidents or were not properly safeguarded by their parents. Farm machinery ranked first as a cause of these fatalities. Other major causes of fatalities included drownings, firearms, and falls.

The age group 15 to 19 suffered the greatest number of fatal accidents, followed in order by the 10 to 14 and the under 5 age groupings. Males sustained about 91 percent, and females 9 percent, of the fatalities. Fatal accidents to girls under 5 years of age occurred at more than twice the average rate of 2.1 per 100,000 females. For boys in the same age group, the accident rate was only half the average rate of 18.5 for all males. Women 75 and older sustained fatalities nearly 4 times the 2.1 average for all females. For men in this older age group, the accident rate was nearly 3 times the average of 18.5 for all males. Of all females, women from 20 to 60 had the lowest fatality rates.

THE PROBLEM

Although gains have been made in collecting information relating to accidents, much remains to be done before accidents can be reported adequately. For instance, reporting of fatal accidents is better than reporting of non-fatal accidents, even those of a serious nature. The vital statistics bureaus in the States collect the original data from death certificates. Except for the estimates made by the National Safety Council, there is no organized program of collecting and analyzing nonfatal but disabling and, therefore, loss-of-time accidents among farm people.

Very little is known about how people respond to hazardous situations and how safety-mindedness can be developed. It is known that individuals differ as to degree of accident proneness. Some look for causes of accidents and are more alert in preventing them than others.

A few studies indicate that accidents tend to peak around 10 a.m., but the reason is not known. These studies indicate also that there may be two afternoon peaks - around 3 p.m. and around 6 p.m. Fatigue and consequent carelessness (or lack of alertness) may contribute to these afternoon peaks.^{3/}

It has been pointed out also that traffic accidents appear to reach a peak at dusk. This indicates that drivers may fail to make the adjustments necessary for safe driving during the change from daylight to dark.

^{3/} See Farm Accidents in Indiana, Ind. (Purdue) Agr. Expt. Sta. Bul. 562, March 1951.

Table 1.- Number of fatal accidents on farms, by 3 principal causes, United States, 1940-53

Period	Number	Average per year			
		Machinery	Animals	Other	Total
		Number	Number	Number	Number
1940-43-----	7,851	916	403	644	1,963
1944-45-----	4,290	1,028	347	770	2,145
1946-48-----	5,765	935	257	730	1,922
1949-53 <u>1</u> /----	12,615	785	160	1,578	2,523
14 years----	30,521	889	277	1,014	2,180

1/ Includes deaths from accidents on farms (by place of residence). Classifications as to type of accident are based on the International Lists of Causes of Death and, since 1948, on the Sixth Revision of this listing.

Department of Health, Education and Welfare, Public Health Service, National Office of Vital Statistics. (Comparability of the series by principal cause is somewhat affected by changes in method of classification. See footnote 2, p. 3.)

During the 14 years in which these 30,521 fatal accidents occurred, the average annual number of such fatalities tended to increase slightly (table 1). This increase was due partly to a change in the classification system begun in 1949. The number of fatalities caused by machinery tended to increase toward the middle, and to decline toward the end, of the period. A few farm safety programs were started during the last half of this period. They were directed particularly against accidents caused by machines. These programs may have contributed to the decline in such accidents. Fatalities caused by animals declined throughout the period, mainly because of the displacement of horses and mules by tractors. As the number of workstock declined, exposure to injury from handling them was reduced.

Although the farm population declined by approximately 25 percent, or from 30.5 to 22.7 million between 1940 and 1953, fatality rates per 100,000 farm people increased substantially during this period (table 2). 4/ The increase was from 6.7 per 100,000 farm persons during 1940-43 to 10.3 during 1949-53. 5/ For farm machinery, fatality rates rose and then fell slightly during the latter part of the 14-year period. Fatality rates for accidents caused by animals declined, particularly during the latter part of the period.

4/ As indicated in footnote 2, changes in classification in 1949 affect the comparability of the data in table 2.

5/ Based on estimates of the National Safety Council of farm-work accidents alone, the rate was 60 percent higher than this, or 16.5 per 100,000 farm people, during 1949-53.

Table 2.- Fatal farm accidents per 100,000 people, by periods and by principal causes, United States, 1940-53 ^{1/}

Period	Cause			
	Machinery	Animals	Other	Total
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
1940-43-----	3.1	1.4	2.2	6.7
1944-48-----	3.7	1.1	2.9	7.7
1949-53-----	3.2	.6	6.5	10.3
Average 1949-53:	3.4	1.1	3.8	8.3

^{1/} Average number of fatalities during period divided by average farm population (as of April 1) during period, as shown in Agricultural Statistics, 1955, table 625. Changes in classification in 1949 affect somewhat the comparability of the rates between periods.

Table 3.- Annual average number of accidents to farm residents, by type of accident and place of occurrence, 1950-55

Item	Fatalities		Injuries	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Motor vehicle-----	6,000	42	210,000	17
Home-----	3,333	24	548,333	46
Farmwork ^{1/} -----	3,900	27	321,667	26
Off farm but not involving motor vehicles-----	1,133	8	140,000	12
Total ^{2/}	14,000	101	1,200,000	101

^{1/} Duplication of 366 fatalities and 20,000 injuries as between motor vehicle and work accidents.

^{2/} Reflects some duplication in reporting methods.

Work-connected accidents apparently account for about a fourth of all accidental injuries and fatalities to farm people, according to estimates of the National Safety Council (table 3). The National Safety Council has developed an estimate, based on its more dependable fatalities series, of the number of disabling injuries. The estimate is based on a ratio of about 1 fatality to upward of 100 disabling injuries to farm people. ^{6/} It should be borne in mind that this report covers only a small segment of the total number of accidents of varying degrees of severity that involve farm people.

ANALYSIS OF VITAL STATISTICS DATA, 1949-53

Vital statistics data supplied before 1949 provided only three cause-of-accident categories - machinery, animals, and other accidents occurring in the course of agricultural operations. However, the more recent data, those for 1949-53, include all deaths reported as having occurred as a result of accidents on the farm. Therefore, the list is more extensive and includes burns from fire and hot substances, drownings, firearms, blows from falling objects, electricity, and lightning. It was possible, therefore, to analyze these later data in greater detail.

During 1949-53, nearly a third of the fatal accidents on farms were associated with the use of machinery (table 4). Following, in order of importance, were drownings, firearms, and falls. An additional third of the fatal accidents on farms were caused by drownings, firearms, and falls (fig. 1).

It is possible to compare for one State - South Carolina - two different methods of collecting data on fatal accidents that occurred from 1949 to 1953. In South Carolina, 153 fatalities were recorded from vital statistics, while data on 823 fatalities to farm and rural people were collected from newspaper accounts. The data compiled from vital statistics excluded fatal accidents that occurred in the home and off the farm. In the latter case, there were no exclusions. A comparison of these two sets of data indicate that only 19 percent of the fatal accidents to rural residents occurred on farmland and around farm service buildings.

CAUSES

By Age Groups

The largest number of fatal accidents from all causes as reported in vital statistics involved those in the age group, 15 to 19, followed in order by the 10 to 14, and the under 5 age groups (fig. 2). These three age groups accounted for 26 percent of all fatalities in which the age of the victim was known.

The highest number of fatalities caused by machinery occurred to farm people between the ages of 55 and 59. Injuries caused by animals were most common among older people. Most of the fatalities from burns and drownings

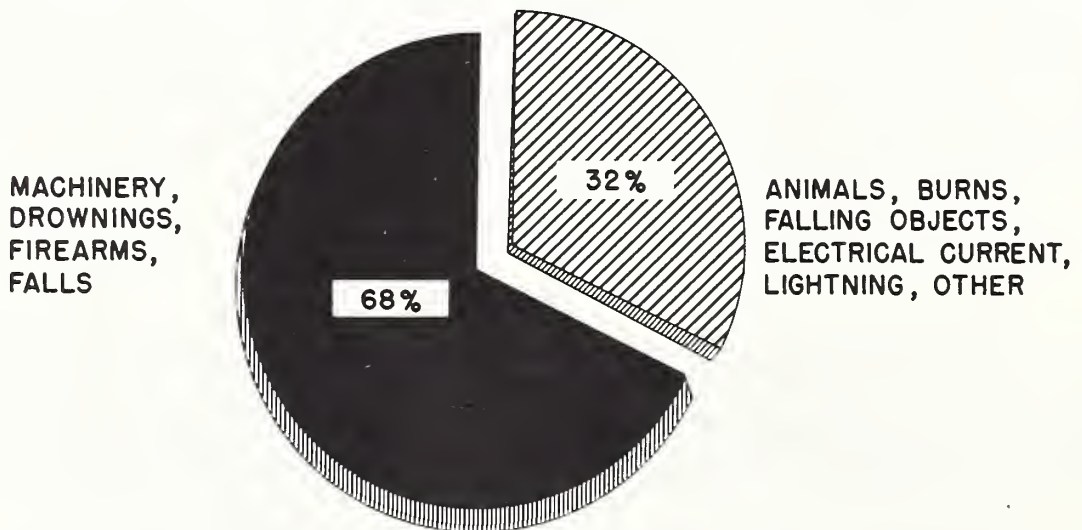
^{6/} In the data shown in table 3, this ratio is approximately 1 fatality to nearly 86 injuries (14,000 x 85.7 = 1,200,000).

Table 4.- Fatal accidents on farms, by cause, United States, 1949-53

Cause	Fatal accidents	
	Number	Percent
Machinery-----	3,924	31.1
Drownings-----	1,624	12.9
Firearms-----	1,597	12.7
Falls-----	1,394	11.0
Animals, insects-----	800	6.3
Burns, hot substances-----	779	6.2
Blow from falling object--	758	6.0
Electric current-----	404	3.2
Lightning-----	394	3.1
All other causes-----	941	7.5
Total-----	12,615	100.0

Department of Health, Education and Welfare, Public Health Service, National Office of Vital Statistics.

***TWO-THIRDS OF FATAL ACCIDENTS ON FARMS
Caused by Machinery, Drownings, Firearms, Falls, U.S.***



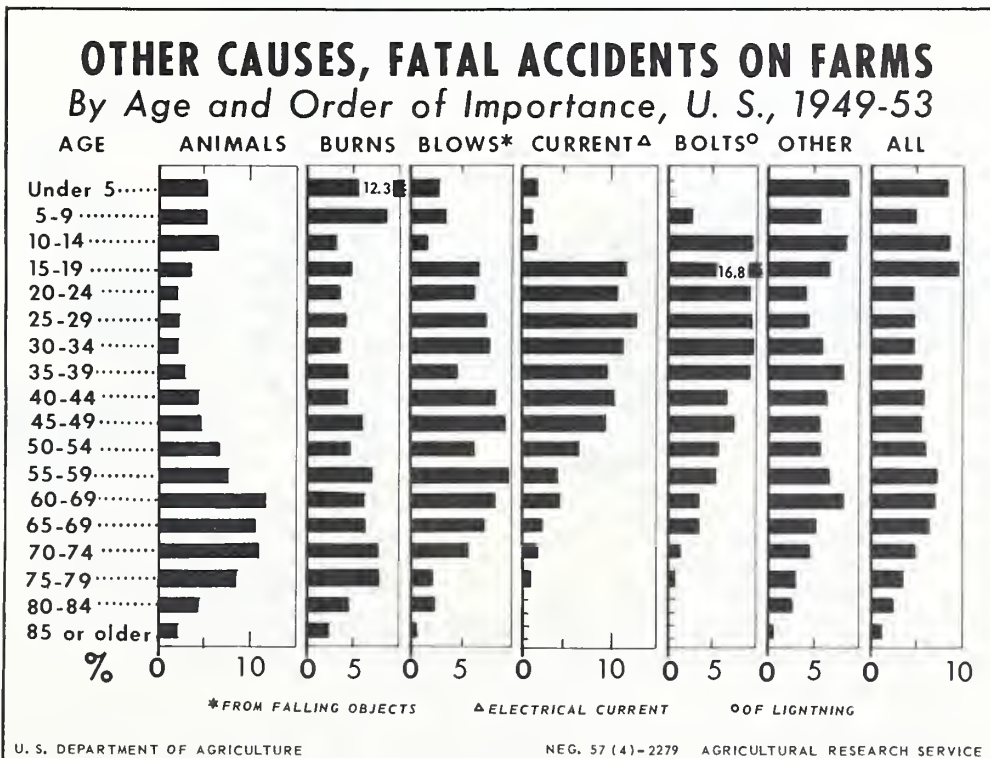
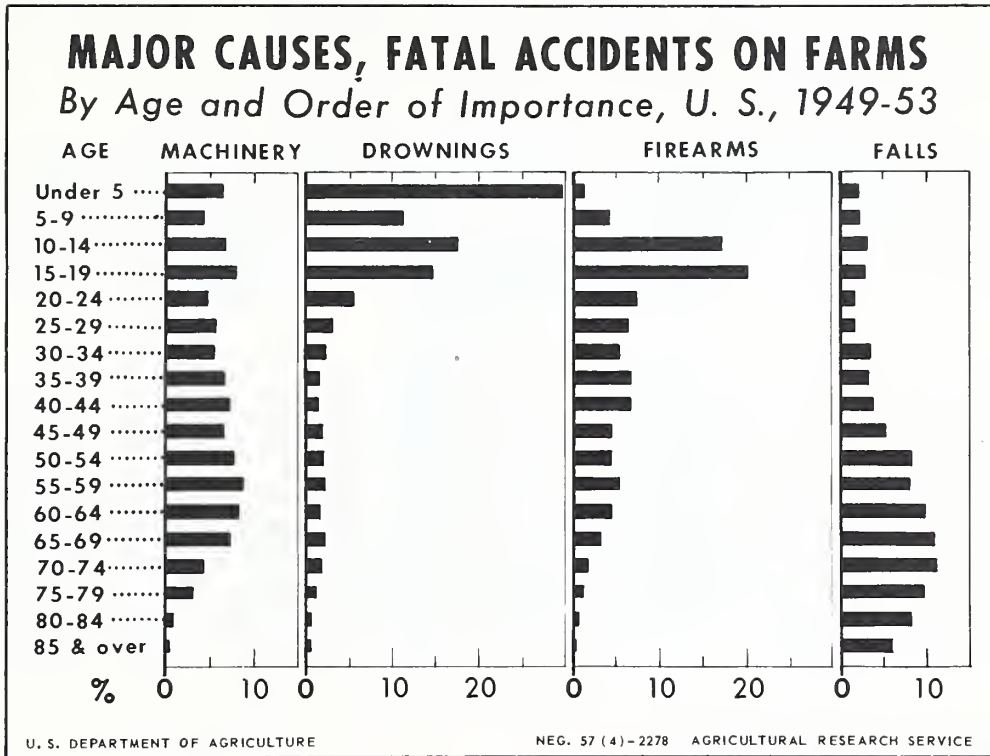


Figure 2

occurred to children under 5 years of age. Firearms and lightning took their highest toll among those between the ages of 15 and 19. Falls most frequently involved older people.

In the South Carolina data for rural residents, which covered the years from 1946 to 1955, and included traffic fatalities, almost 90 percent of the fatalities were accounted for by five causes. In order of importance they were: Motor vehicles, burns, drownings, firearms, and machinery. (See table 5, footnote 2.) Motor vehicles accounted for almost half of all fatalities (fig. 3). Other relationships by cause and by age groups are shown in figure 4.

In the South Carolina data, three types of accidents were caused by motor vehicles. In order of importance, they were collisions, overturns (including other motor-vehicle accidents not otherwise classified), and striking pedestrians as they crossed or walked on highways (fig. 5). Teenagers (15 to 19) were involved in more fatal collisions and overturns than any other age group. Those under 20 and those 60 and older accounted for 80 percent of all pedestrians who were fatally injured by motor vehicles (fig. 6). Nearly half, or 44 percent, of the pedestrians killed by motor vehicles were children under 10 years of age.

S. Carolina, 1946-1955

MOTOR VEHICLES ACCOUNT FOR ABOUT HALF OF FATALITIES

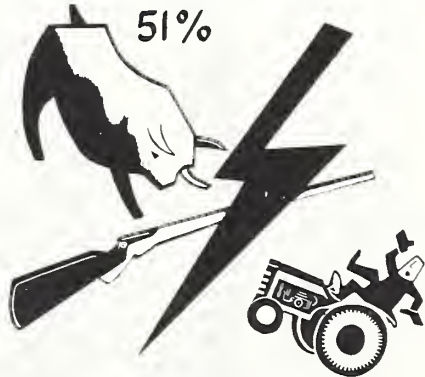
MOTOR VEHICLES
49%



Collisions
hit pedestrians
overturns *

* Including other motor vehicle accidents not otherwise classified.

OTHER CAUSES
51%



Burns, drownings, machinery,
firearms, lightning, animals,
falls, falling objects, and others.

Figure 3

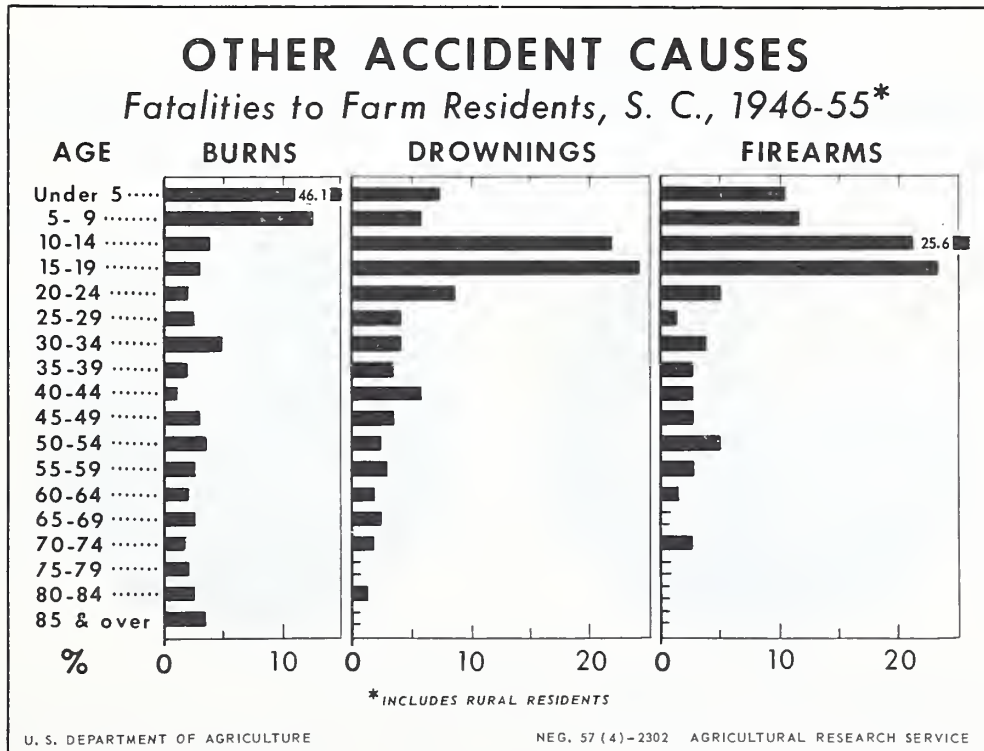
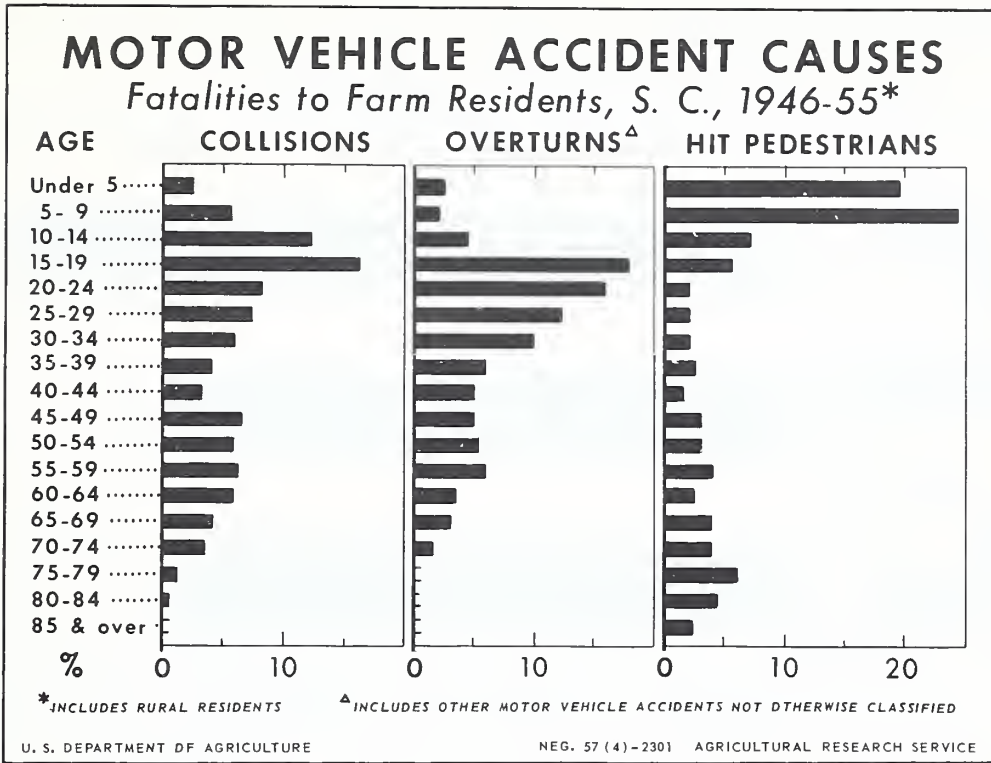
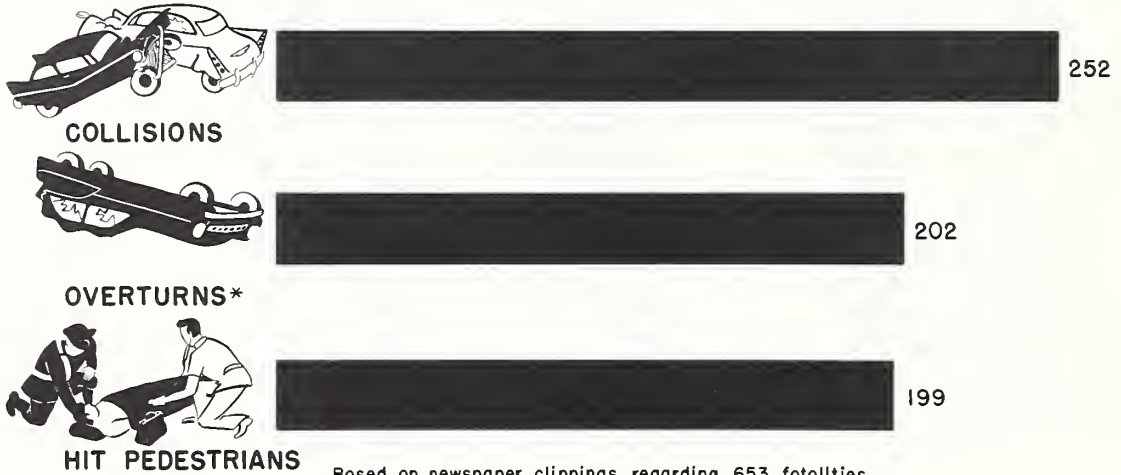


Figure 4

S. Carolina, 1946-1955

**FATAL MOTOR VEHICLE ACCIDENTS
to Farm and Rural Residents**



Based on newspaper clippings regarding 653 fatalities.

* Including other motor vehicle accidents not otherwise classified.

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Figure 5

**YOUTH AND AGED
Make up 80% of Pedestrian Fatalities, S.C., 1946-'55**



* Killed by motor vehicles while crossing or walking on highways.

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Figure 6

Table 5.- South Carolina: Fatal accidents on farms compared with all fatal accidents of farm and rural people, 1949-53

Cause or agency	Fatalities on farms	All accident fatalities
	(Vital Statistics) <u>1/</u>	(Newspaper accounts) <u>2/</u>
	Number	Number
Motor vehicles-----:	<u>3/</u>	<u>4/</u> 430
Machinery-----:	31	44
Animals-----:	15	18
Burns or hot substance----:	8	<u>5/</u> 114
Drownings-----:	27	<u>4/</u> 99
Firearms-----:	25	<u>5/</u> 45
Blow from falling object--:	13	2
Falls-----:	9	10
Lightning-----:	8	<u>5/</u> 22
Electric current-----:	5	<u>5/</u> 9
Miscellaneous-----:	12	30
Total-----:	153	823

1/ As defined in footnote 2, page 3 of this report.

2/ Includes all types of fatal accidents to farm or rural people, without regard to place of occurrence.

3/ Off-farm motor vehicle traffic accident fatalities not reported.

4/ Includes fatalities that occurred off the farm, such as traffic fatalities.

5/ Includes fatalities that occurred in the home.

By Regions

From 1949 to 1953, about a fifth of all fatal accidents on farms in the United States occurred in the Corn Belt (table 6). 7/ About an eighth occurred in the Northeastern and Appalachian States. The highest number of machinery-caused fatalities also occurred in the Corn Belt, and the lowest number in the Southeastern States. More fatalities were associated with the use of machinery than with any other cause. This was true in all regions except the Southern Plains, where drowning slightly exceeded machinery as a cause of accident fatalities. Differences among regions in the number of fatalities by causes are shown in table 6.

By Sex of Victim

About 91 percent of these accidents involved males and about 9 percent females (table 7). By regions, the percentage for males ranged from 93 percent of the total in the Pacific States to about 88 percent of the total in the Southern Plains States. 7/

Fatality Rates per 100,000 Farm People

Fatality rates in connection with accidents increase with age (fig. 7). Therefore, those in the older age groups are subject to the highest fatality

7/ For a listing of States in each region, see footnote 1, table 6.

Table 6.- Fatal accidents on farms, by regions and principal causes, 1949-53

Region 1/	Cause											Total				
	Machine	Drown-	Fire-	Falls	Ani-	Blows	Elec-	ery	ings	arms	insects		scalds	ing	cur-	Light-
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Northeast	486	139	188	251	113	101	88	37	22	101	101	1,526				
Corn Belt	918	276	317	322	127	155	160	65	63	169	169	2,572				
Lake States	519	92	144	235	102	56	87	33	25	113	113	1,406				
Appalachian	379	173	216	165	102	89	141	40	46	125	125	1,476				
Southeast	230	141	158	70	69	77	77	38	67	81	81	1,008				
Delta States	184	132	99	30	50	69	66	26	47	62	62	765				
Southern Plains	244	245	163	61	58	84	30	33	39	62	62	1,019				
Northern Plains	432	150	99	99	50	63	33	17	30	85	85	1,058				
Mountain	245	160	96	66	83	41	31	33	51	74	74	880				
Pacific	287	116	117	95	46	44	45	82	4	69	69	905				
United States	3,924	1,624	1,597	1,394	800	779	758	404	394	941	941	12,615				

1/ Northeast: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

Corn Belt: Illinois, Indiana, Iowa, Ohio, and Missouri.

Lake States: Michigan, Minnesota, and Wisconsin.

Appalachian States: Kentucky, North Carolina, Tennessee, Virginia, and West Virginia.

Southeast: Alabama, Florida, Georgia, and South Carolina.

Delta States: Arkansas, Louisiana, and Mississippi.

Southern Plains: Oklahoma and Texas.

Northern Plains: Kansas, Nebraska, North Dakota, and South Dakota.

Mountain States: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

Pacific States: California, Oregon, and Washington.

Table 7.- Fatal accidents on farms, by regions and sex of victim, 1949-53

Region ^{1/}	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
Northeast-----	1,401	91.8	125	8.2	1,526	100.00
Corn Belt-----	2,382	92.6	190	7.4	2,572	100.00
Lake States-----	1,259	89.6	147	10.4	1,406	100.00
Appalachian-----	1,352	91.6	124	8.4	1,476	100.00
Southeast-----	905	89.8	103	10.2	1,008	100.00
Delta States-----	685	89.6	80	10.4	765	100.00
Southern Plains---	893	87.6	126	12.4	1,019	100.00
Northern Plains---	962	90.9	96	9.1	1,058	100.00
Mountain-----	782	88.9	98	11.1	880	100.00
Pacific-----	842	93.0	63	7.0	905	100.00
United States--	11,463	90.9	1,152	9.1	12,615	100.00

^{1/} For a listing of States in each region, see footnote 1, table 6.

rates. For those aged 60 or over, the fatality rate was about 3 times the rate for those under 20.

Analyses not included in the report indicate that there is little difference between fatality rates, by regions, for the various age groups - except perhaps for those in the older age groups. But at these ages the data were meagre. For age 85 and over, the rates were highest in the Northern Plain and Lake States. ^{8/}

The data based on newspaper accounts in South Carolina, which cover the years from 1946 to 1955, also emphasize the fact that accident fatality rates are highest for the older age groups. The lowest fatality rates involved the age group 5 to 9. But children under 5 were more subject to accident fatalities than were persons in other 5-year age groups under 20.

Month of Occurrence of Fatalities

The vital statistics data by place of accident for 1949-53 did not show the months in which fatalities occurred. But the data from newspaper accounts that covered fatal accidents to farm and rural people in South Carolina from 1946 to 1955 indicated that December led other months in number of fatalities. It was followed closely by July. Other above-average months were January, May, June, September, and November.

^{8/} For a listing of States in each region, see table 6, footnote 1.

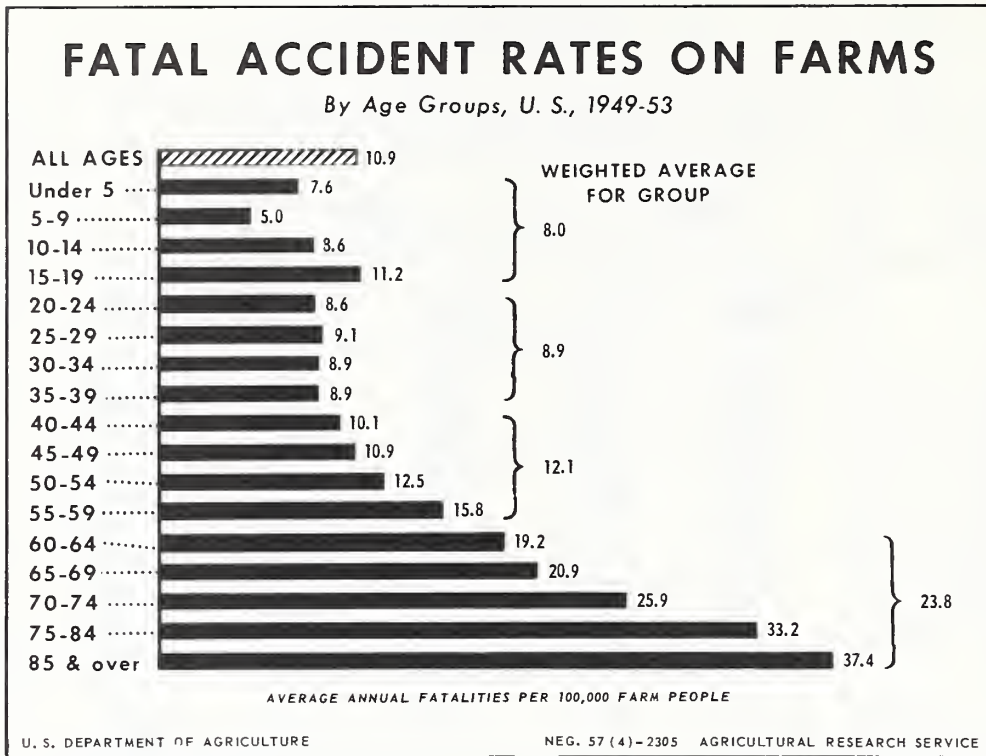


Figure 7

For the South Carolina data, a distribution of fatalities by causes and by months was available (fig. 8). As might be expected, drownings occurred mainly in May, June, and July. Burns occurred most frequently in November, December, January and February, when many farm people were exposed to open fireplaces and stoves. Motor vehicle collisions were most frequent in September; pedestrian fatalities, in November; and overturns and other types of fatalities caused by machinery were most frequent in August.

Data By States

Vital statistics data by States show that the largest number of farm-work-accident fatalities during 1949-53 occurred in Texas (727), followed in order by Pennsylvania (571), Illinois (555), Iowa (544), Wisconsin (528), Missouri (525), Ohio (522), and California (506). These data, by causes, are shown in table 8.

Machinery was the leading cause of fatalities in 43 States. Drowning was the leading cause in Arizona and Texas, and firearms led as a cause in Rhode Island and West Virginia.

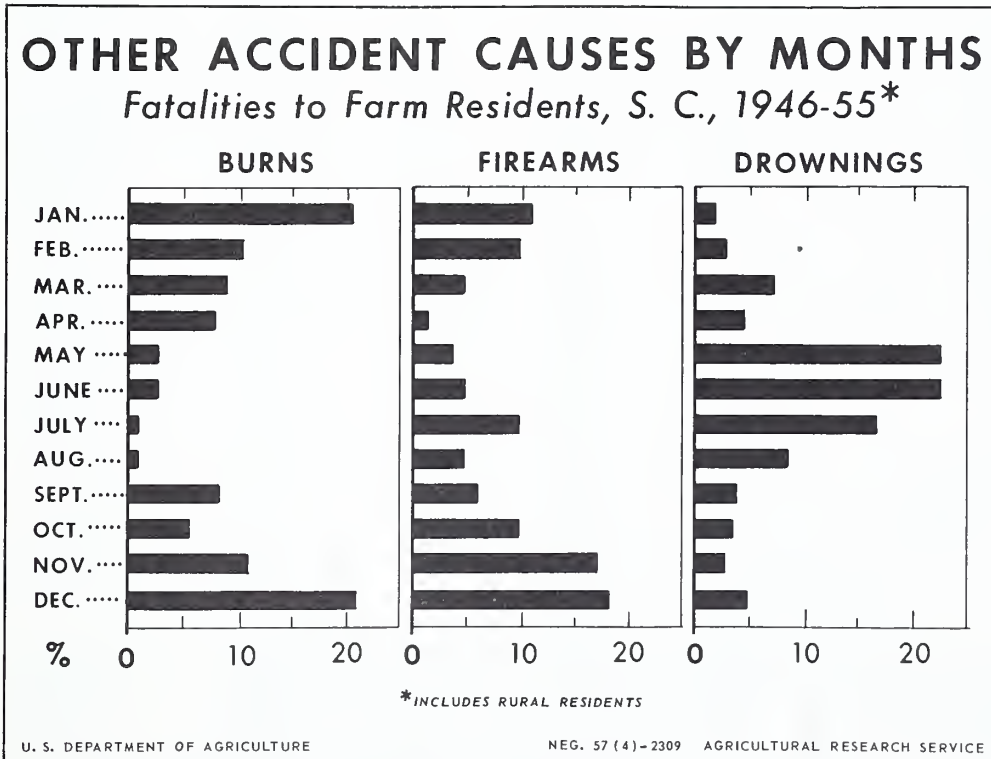
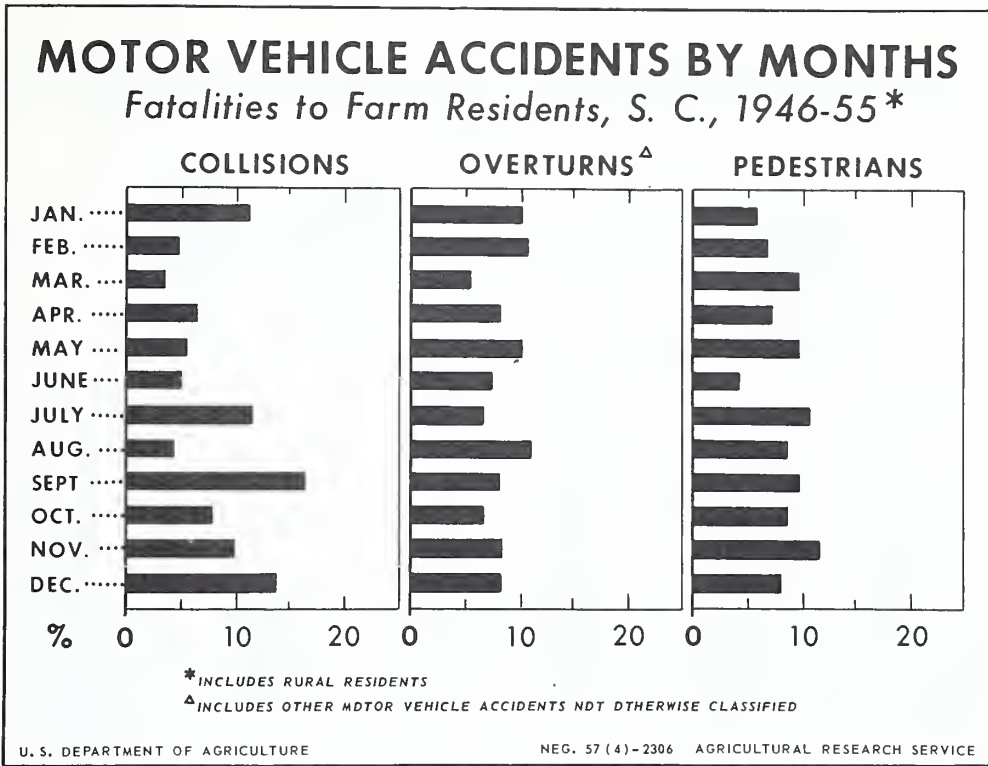


Figure 8

Table 8.- Fatal accidents on farms, by cause, sex of victim, and State, 1949-53

State	Cause										Sex of victim		
	Ma- chin- ery	Ani- mals	Burns	Drown- ings	Fire- arms	Light- ning	Elec- tric cur- rent	Falls	Blow from fall- ing ob- ject	Other	Total	Male	Female
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Alabama	64	23	22	41	57	22	8	29	20	26	312	282	30
Arizona	16	3	3	30	7	3	10	5	6	18	101	84	17
Arkansas	63	25	29	42	43	14	12	15	26	26	295	265	30
California	161	19	30	63	59	1	55	62	18	38	506	473	33
Colorado	42	16	11	38	26	15	6	13	7	9	183	157	26
Connecticut	15	6	2	7	2	5	1	13	3	4	58	52	6
Delaware	5	2	1	0	3	1	1	2	2	1	18	17	1
Florida	38	8	23	22	16	18	16	14	10	11	176	162	14
Georgia	97	23	24	51	60	19	9	18	34	32	367	326	41
Idaho	47	16	5	23	14	4	6	13	5	8	141	129	12
Illinois	219	23	31	56	64	13	12	67	29	41	555	525	30
Indiana	146	23	26	31	53	14	11	68	37	17	426	394	32
Iowa	203	23	29	58	62	19	16	63	33	38	544	494	50
Kansas	142	21	21	62	33	12	9	34	11	29	374	336	38
Kentucky	88	20	16	40	58	13	10	51	19	25	340	311	29
Louisiana	40	9	19	26	17	14	4	6	14	10	159	145	14
Maine	13	6	1	4	7	1	1	9	6	7	55	52	3
Maryland	31	6	12	16	9	0	4	11	8	9	106	95	11
Massachusetts	14	6	3	4	7	1	0	11	1	7	54	52	2
Michigan	143	25	20	18	49	8	13	68	21	22	387	353	34
Minnesota	190	31	21	47	53	8	9	64	27	41	491	439	52
Mississippi	81	16	21	64	39	19	10	9	26	26	311	275	36
Missouri	186	23	30	80	74	8	8	47	37	32	525	489	36
Montana	68	12	9	26	23	6	5	11	5	21	186	164	22
Nebraska	134	17	21	43	29	11	4	40	8	21	328	303	25
Nevada	4	4	1	2	4	0	0	4	0	2	21	19	2
New Hampshire	7	2	2	2	4	1	0	6	2	3	29	28	1
New Jersey	22	5	8	12	12	1	1	15	0	7	83	80	3
New Mexico	25	13	7	20	8	15	1	7	3	3	102	91	11
New York	159	40	29	38	56	4	14	85	27	34	486	442	44
North Carolina	109	17	28	50	52	15	8	26	50	38	393	355	38
North Dakota	73	5	11	23	21	2	0	10	6	10	161	147	14
Ohio	164	35	39	51	64	9	18	77	24	41	522	480	42
Oklahoma	81	17	15	78	48	9	5	16	6	17	292	259	33
Oregon	54	12	5	24	27	1	16	11	15	12	177	165	12
Pennsylvania	196	33	40	53	79	7	14	89	34	26	571	522	49
Rhode Island	2	1	0	0	3	0	0	1	0	0	7	7	0
South Carolina	31	15	8	27	25	8	5	9	13	12	153	135	18
South Dakota	83	7	10	22	16	5	4	15	8	25	195	176	19
Tennessee	86	24	15	46	34	9	12	36	26	26	314	288	26
Texas	163	41	69	167	115	30	28	45	24	45	727	634	93
Utah	28	13	2	11	5	1	4	8	1	3	76	72	4
Vermont	22	6	3	3	6	1	1	9	5	3	59	54	5
Virginia	66	27	19	29	36	8	8	32	26	22	273	254	19
Washington	72	15	9	29	31	2	11	22	12	19	222	204	18
West Virginia	30	14	11	8	36	1	2	20	20	14	156	144	12
Wisconsin	186	46	15	27	42	9	11	103	39	50	528	467	61
Wyoming	15	6	3	10	9	7	1	5	4	10	70	66	4
United States	3,924	800	779	1,624	1,597	394	404	1,394	758	941	12,615	11,463	1,152

