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Alcohol-impaired driving among adults—USA, 2014–2018

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Received 3 August 2021
Accepted 16 October 2021
Published Online First 5 November 2021

ABSTRACT

Introduction Alcohol-impaired driving (AID) crashes accounted for 10 511 deaths in the USA in 2018, or 29% of all motor vehicle-related crash deaths. This study describes self-reported AID in the USA during 2014, 2016 and 2018 and determines AID-related demographic and behavioural characteristics.

Methods Data were from the nationally representative Behavioral Risk Factor Surveillance System. Adults were asked 'During the past 30 days, how many times have you driven when you have had perhaps too much to drink?' AID prevalence, episode counts and rates per 1000 population were estimated using annualised individual AID episodes and weighted survey population estimates. Results were stratified by characteristics including gender, binge drinking, seatbelt use and healthcare engagement.

Results Nationally, 1.7% of adults engaged in AID during the preceding 30 days in 2014, 2.1% in 2016 and 1.7% in 2018. Estimated annual number of AID episodes varied across year (2014: 111 million, 2016: 186 million, 2018: 147 million) and represented 3.7 million, 4.9 million and 4.0 million adults, respectively. Corresponding yearly episode rates (95% CIs) were 452 (412–492) in 2014, 741 (676–806) in 2016 and 574 (491–657) in 2018 per 1000 population. Among those reporting AID in 2018, 80% were men, 86% reported binge drinking, 47% did not always use seatbelts and 60% saw physicians for routine check-ups within the past year.

Conclusions Although AID episodes declined from 2016 to 2018, AID was still prevalent and more common among men and those who binge drink. Most reporting AID received routine healthcare. Proven AID-reducing strategies exist.

INTRODUCTION

Motor vehicle crashes in the USA are a significant public health issue that causes death and injury, burden health systems and have negative economic impacts. In 2018, traffic crashes on public roadways in the USA caused 36 560 motor vehicle-related deaths[1] and an additional 2.7 million non-fatal emergency department visits.[2] These statistics include drivers, passengers and non-occupants such as pedestrians and bicyclists. Alcohol-impaired driving (AID) is a major risk factor for traffic crashes. Of the 36 560 motor vehicle crash deaths that occurred in 2018, 29% (n=10 511) involved an alcohol-impaired driver.[1] Both the yearly number of deaths and the number that involved an alcohol-impaired driver have either held steady or increased annually from 2014 through 2018,[1 3–6] suggesting that a renewed effort to confront and reduce AID is needed.[7–9]

Efforts to reduce AID in the past have been successful. Between 1982 and 1997, there was a 43% decrease in the proportion of alcohol-impaired drivers involved in fatal crashes.[10] This corresponded with a time when many US states implemented laws making it illegal to drive with a blood alcohol concentration of 0.08 g/dL or higher and grassroots organisations like Mothers Against Drunk Driving (MADD) were formed to promote policies to reduce AID.[11] Strategies addressing AID have the potential to substantially reduce motor vehicle crashes and deaths.[12] Effective strategies to prevent AID exist, including drunk driving laws, sobriety checkpoints, ignition interlocks, mass media campaigns and increasing alcohol taxes.[9 13] However, implementation of these strategies varies across states and communities.[14–16]

The total number of self-reported AID episodes among adults in the USA per year has been estimated to range from 110 to 160 million during 1993 through 2012 with no clear decrease over time.[17 18] In 2012, an estimated 1.8% of adults in the USA reported at least one AID episode during the previous 30 days, which translated to 4.2 million adults engaging in 121 million annual AID episodes (a rate of 505 per 1000 population).[18] An update to these estimates is needed to illustrate the continued call for universal implementation of prevention efforts using both established and promising strategies.

This study estimated the annual prevalence, number of episodes and rates of AID among adults in the USA during 2014, 2016 and 2018. We also examined how these outcomes varied by certain demographic and behavioural characteristics.

METHODS

Data set

Data were from the 2014, 2016 and 2018 Behavioral Risk Factor Surveillance System (BRFSS) surveys. BRFSS is a nationally representative, cross-sectional, ongoing, random-digit-dialled telephone survey. State health departments in collaboration with the US Centers for Disease Control and Prevention use trained interviewers to collect reported health-related behaviours from a representative sample of civilian, non-institutionalised adults aged ≥18 years residing in any US state or territory. BRFSS participants are recruited via landline and cellular telephone numbers. All BRFSS questionnaires and data are available online.[19] Because the BRFSS is a surveillance system, the Centers for

To cite: Barry V, Schumacher A, Sauber-Schatz E. *Inj Prev* 2022;**28**:211–217.

Disease Control and Prevention's Institutional Review Board has determined that the BRFSS is exempt from its review.

Nearly half a million adults completed the interview in each year (456 664 in 2014; 486 303 in 2016 and 437 436 in 2018). We limited the analysis to adults residing in the 50 US states or the District of Columbia that had information recorded for the AID survey question. The median response rates for the[19] BRFSS 2014, 2016 and 2018 surveys were 47% (49% landline, 41% cell phone), 47% (48% landline, 46% cell phone) and 50% (53% landline, 43% cell phone), respectively.

Survey questions

In even-numbered years, BRFSS respondents who reported having had at least one alcoholic beverage in the past 30 days were asked 'During the past 30 days, how many times have you driven when you have had perhaps too much to drink?' Responses were recorded as whole numbers ≥0 and were considered to be the number of AID episodes. Those who reported no alcohol in the past 30 days were coded as having zero AID episodes. We created a binary variable for AID (yes/no) categorising people reporting zero episodes as 'no' and those with ≥1 episodes as 'yes'.

Respondent demographic characteristics collected included age in years at the time of the survey, race and ethnicity, highest level of education obtained, current marital status and household income. Reported behavioural characteristics collected included binge drinking and seatbelt use. Binge drinking was defined as having on at least one occasion five or more drinks for men and four or more drinks for women during the past 30 days. Seatbelt use was ascertained by asking 'How often do you use seatbelts when you drive or ride in a car? Would you say—always, nearly always, sometimes, seldom or never?' Responses were categorised into a binary variable: always versus less than always. AID prevalence, episodes and rates were described across demographic and behavioural characteristic categories. Healthcare utilisation was assessed to estimate the percentage of adults who engaged in AID who also had recently accessed healthcare for a routine check-up. This was measured by the question 'About how long has it been since you last visited a doctor for a routine check-up? (A routine check-up is a general physical examination, not an examination for a specific injury, illness or condition.)' Answers were recorded as being within the past 12 months, 2 years, 5 years or ≥5 years ago.

Statistical analyses

Analyses were carried out separately for each year. Results were weighted using the BRFSS-provided weights, cluster and stratification variables to make results nationally representative. National AID 30-day prevalence was estimated using the percentage of respondents who reported any AID in the previous 30 days. Annual estimates of AID episodes per respondent were calculated by multiplying the respondent's reported episodes in the preceding 30 days by 12. For the 28 respondents (8 in 2014, 6 in 2016 and 14 in 2018) who reported more than one AID episode daily, annualised AID episodes were truncated at 360 (which is equivalent to 30 AID episodes per month). Annual rates of AID episodes and corresponding 95% CIs were then calculated by dividing the annual number of AID episodes by the respective weighted population estimate from BRFSS for the respective year (2014, 2016 or 2018). Each rate's SE was used to calculate CIs and was approximated using Taylor series linearisation (also called the 'delta method').[20] Annual AID episode rates were reported per 1000 population. National AID prevalence, number of episodes and rates per 1000 population were stratified by demographic and behavioural characteristics. Data analysis was completed using the complex sampling survey procedures in SAS V.9.4.

RESULTS

Participants

The analysis included over 1 million respondents from the 50 US states and District of Columbia who had non-missing AID information (426 910 in 2014, 448 062 in 2016 and 405 074 in 2018).

AID prevalence, number of episodes and rates

Nationally, 1.7%, 2.1% and 1.7% of adults in the years 2014, 2016 and 2018 reported having engaged in AID during the previous 30 days (tables 1–3).

On average, 57% of those who reported AID indicated one episode in the past 30 days, 24% indicated two episodes, 12% indicated 3–5 episodes and 7% reported that they had driven impaired ≥6 times over the past 30 days (data not shown). The estimated national annual number of AID episodes varied across years (2014: 111 million, 2016: 186 million, 2018: 147 million) and represented 3.7 million, 4.9 million and 4.0 million adults, respectively. The rate of AID episodes per 1000 population was highest in the year 2016 (rate=741, 95% CI 676 to 806) compared with 2014 (rate=452, 95% CI 412 to 492) and 2018 (rate=574, 95% CI 491 to 657).

AID by demographic and behavioural characteristics

In each year, AID was most common among men, people who binge drink and people who did not always use a seatbelt (tables 1–3). Men accounted for an overwhelming percentage of AID episodes (80% in 2014, 70% in 2016 and 80% in 2018; data not shown). Similarly, people who engaged in recent binge drinking accounted for 85%, 80% and 86% of all AID episodes in 2014, 2016 and 2018, respectively (data not shown). Those who reported more binge drinking reported more AID episodes. For example, in 2014, the 4% of adults who reported binge drinking at least four times per month accounted for 58% of AID episodes. This was true in 2016 and 2018 where 4% and 5% of those who reported binge drinking at least four times a month accounted for 55% and 65% of AID episodes in each respective year. People who reported not always wearing a seatbelt had an annual AID rate four times higher in 2014 and 2016 and six times higher in 2018 than those who always wore a seatbelt.

Reported AID varied by other characteristics as well. Regardless of gender and year, AID rates were highest among people aged 21–34 years and then decreased with age. Married adults, particularly married male adults, tended to have lower AID rates compared with those who were coupled, previously married or never married. There were no significant differences in AID rates by race/ethnicity, education level or household income no matter the year or gender. Among those engaging in AID, 60% reported seeing a doctor for a routine check-up within the past year (data not shown). Another 16% had a check-up between 1 and 2 years prior (data not shown). Among respondents who reported recent binge drinking, 62% reported a routine check-up within the past year (data not shown). Finally, among those reporting recent AID and recent binge drinking, 57% had a check-up within the past year (data not shown).

Table 1 Percentage of adults reporting recent alcohol-impaired driving, annual episodes and episode rates per 1000 population*: 2014

	Overall				Men				Women			
	%	Number of episodes	Rate	95% CI	%	Number of episodes	Rate	95% CI	%	Number of episodes	Rate	95% CI
Total	1.7	110 944 086	452	412 to 492	2.6	88 420 455	740	666 to 814	0.8	22 523 631	179	144 to 213
Age group (years)												
18–20	1.1	3 870 671	267	151 to 383	1.6	2 926 456	392	182 to 602	0.5	944 215	134	45 to 224
21–24	3.9	15 863 928	921	670 to 1172	5.5	12 024 610	1356	902 to 1810	2.1	3 839 318	459	268 to 651
25–34	2.6	32 297 921	760	622 to 898	3.9	25 987 040	1210	949 to 1471	1.3	6 310 881	301	215 to 386
35–54	1.7	34 657 343	413	362 to 464	2.7	28 680 700	690	590 to 790	0.7	5 976 643	141	118 to 164
≥55	0.9	24 254 224	277	223 to 332	1.5	18 801 649	468	385 to 552	0.3	5 452 574	115	43 to 187
Race/ethnicity												
White, non-Hispanic	1.7	72 045 438	461	417 to 505	2.8	58 771 144	775	688 to 862	0.8	13 274 294	165	142 to 188
Black, non-Hispanic	1.6	14 127 919	496	372 to 619	2.5	10 606 062	814	564 to 1063	0.9	3 521 857	228	138 to 317
Hispanic	1.6	16 224 292	434	305 to 562	2.6	13 438 206	716	473 to 959	0.7	2 786 086	150	69 to 230
Other, non-Hispanic	1.1	4 885 354	307	93 to 521	1.8	2 760 638	349	224 to 475	0.4	2 124 715	265	1 to 672
Multiracial, non-Hispanic	1.5	1 918 853	610	236 to 983	2.2	1 608 848	1061	293 to 1829	0.9	310 004	190	84 to 296
Education												
<High school	1.0	17 042 593	480	324 to 637	1.9	15 219 215	855	551 to 1160	0.2	1 823 378	103	32 to 174
High school	1.5	29 612 698	429	359 to 498	2.4	25 090 855	716	585 to 847	0.6	4 521 843	133	89 to 177
Some college	1.8	33 684 906	448	388 to 508	3.0	26 794 425	776	654 to 897	0.8	6 890 482	170	129 to 210
College	2.1	30 583 379	486	411 to 561	3.0	21 295 451	694	589 to 798	1.2	9 287 929	288	180 to 395
Marital status												
Married	1.1	35 452 489	284	241 to 326	1.8	28 181 688	448	384 to 511	0.5	7 270 801	117	61 to 174
Coupled	2.4	7 665 211	755	460 to 1049	3.8	6 839 151	1325	748 to 1903	0.9	826 060	165	91 to 239
Previously married	1.5	24 394 672	494	404 to 584	2.9	18 978 371	1032	805 to 1258	0.6	5 416 300	175	123 to 227
Never	2.8	42 212 452	718	612 to 824	3.9	33 324 492	1047	860 to 1234	1.6	8 887 961	330	257 to 402
Household income												
<US$20k	1.2	17 813 460	411	302 to 521	2.1	13 653 919	740	500 to 980	0.6	4 159 541	167	98 to 237
US$20k–<US$35k	1.6	20 276 949	477	371 to 584	2.5	16 523 236	819	601 to 1036	0.8	3 753 713	168	116 to 221
US$35k–<US$50k	1.8	15 079 802	530	372 to 688	2.7	11 231 515	779	568 to 990	0.8	3 848 287	274	38 to 510
US$50k–<US$75k	2.0	15 917 264	517	412 to 622	3.0	13 640 932	842	645 to 1038	0.8	2 276 332	156	121 to 192
≥US$75k	2.2	33 969 359	541	474 to 608	3.2	27 453 632	806	690 to 922	1.0	6 515 727	227	176 to 278
Binge drink												
No	0.8	18 001 485	225	169 to 281	1.2	13 270 054	333	227 to 439	0.4	4 731 431	118	83 to 152
1 x month	4.7	10 983 180	830	694 to 966	5.8	8 349 801	1071	857 to 1286	3.2	2 633 378	484	360 to 608
2–3 x month	7.6	16 584 332	1550	1340 to 1760	9.3	12 981 570	1901	1611 to 2191	4.8	3 602 762	931	654 to 1208
≥4 x month	13.9	62 999 896	5304	4597 to 6011	15.4	51 898 356	6090	5215 to 6965	10.1	11 101 539	3308	2142 to 4474
Seatbelt use												
<Always	3.6	40 301 630	1368	1117 to 1620	4.9	34 265 292	1874	1517 to 2230	1.6	6 036 339	541	223 to 859
Always	1.4	70 078 219	360	327 to 393	2.2	53 670 382	595	529 to 661	0.7	16 407 837	157	134 to 181

*Data are self-reported from US-based 2014 Behavioral Risk Factor Surveillance System. Results weighted by survey population estimates.

DISCUSSION AND PUBLIC HEALTH IMPLICATION

AID continues to be prevalent in the USA, and the majority of AID episodes during 2014–2018 occurred among men and those who engaged in recent binge drinking. AID prevalence and episode rates were also higher among those aged 21–34 years compared with older ages and among those who did not always wear seatbelts compared with those who always wear seatbelts.

These 2014, 2016 and 2018 BRFSS results are similar to previously published 2012 BRFSS results. In 2012, 2014, 2016 and 2018, 1.8%, 1.7%, 2.1% and 1.7% of adults engaged in AID. This translated to 4.2 million adults, 3.7 million adults, 4.9 million adults and 4.0 million adults engaging in 121 million annual AID episodes, 111 million episodes, 186 million episodes and 147 million episodes during each of the 4 years.[18] Rates across the 4 years were 505, 452, 741 and 574 per 1000 population.[18] Similar to 2014–2018, in 2012, men accounted for 80% of AID episodes and respondents who reported binge drinking accounted for 85% of episodes.[18] Taken all together, there were slight differences in AID across these years with a peak in AID prevalence and number of episodes in 2016, but no clear trend across the years 2012, 2014, 2016 and 2018. This roughly correlates with national annual motor vehicle crash death data that suggest crash deaths and the percentage of them related to AID have remained relatively constant over the years 2012–2018.[1 3–6] It is unclear what might be behind the peak in AID in 2016. Changes in AID can be influenced by changing economic and societal factors (like economic recessions). Preliminary data show an increase in AID-related crash deaths in 2020 (during the COVID-19 pandemic), which might signify an associated increase in 2020 BRFSS AID rates.[21]

AID-related deaths are preventable via proven strategies. To reduce AID, states and communities can consider implementing

Table 2 Percentage of adults reporting recent alcohol-impaired driving, annual episodes and episode rates per 1000 population*: 2016

	Overall				Men				Women			
	%	Number of episodes	Rate	95% CI	%	Number of episodes	Rate	95% CI	%	Number of episodes	Rate	95% CI
Total	2.1	186 204 686	741	676 to 806	3.0	130 116 241	1064	948 to 1181	1.2	55 873 419	434	371 to 496
Age group (years)												
18–20	1.5	9 732 889	695	358 to 1032	2.1	7 645 790	1012	416 to 1607	0.8	2 087 099	324	104 to 544
21–24	3.6	17 391 530	979	797 to 1160	4.6	10 424 369	1186	938 to 1435	2.6	6 967 162	775	512 to 1039
25–34	3.2	47 678 014	1092	866 to 1318	4.2	32 982 904	1492	1087 to 1897	2.1	14 480 084	672	480 to 864
35–54	2.4	74 940 459	897	771 to 1022	3.4	52 640 447	1272	1058 to 1485	1.4	22 300 012	529	395 to 662
≥55	1.1	36 461 793	396	338 to 454	1.8	26 422 731	623	516 to 730	0.5	10 039 062	202	145 to 259
Race/ethnicity												
White, non-Hispanic	2.2	106 414 023	677	606 to 747	3.2	76 409 861	999	868 to 1131	1.2	30 004 161	371	314 to 429
Black, non-Hispanic	2.0	23 723 046	807	572 to 1043	2.9	15 630 286	1171	717 to 1625	1.4	7 877 734	491	285 to 698
Hispanic	2.0	34 729 369	883	684 to 1081	2.9	25 022 876	1276	934 to 1618	1.2	9 706 493	492	288 to 696
Other, non-Hispanic	1.6	14 276 080	853	556 to 1149	2.0	8 207 226	978	548 to 1408	1.2	6 068 854	727	318 to 1135
Multiracial, non-Hispanic	1.8	1 994 266	551	322 to 780	1.9	1 230 834	668	292 to 1043	1.7	763 432	431	172 to 690
Education												
<High school	1.7	36 496 600	1057	735 to 1378	2.8	30 607 658	1749	1150 to 2348	0.5	5 673 917	333	116 to 550
High school	1.8	49 724 881	706	593 to 818	2.7	38 182 472	1064	864 to 1265	0.9	11 542 409	334	237 to 430
Some college	2.1	50 724 269	652	565 to 738	3.0	31 345 970	873	734 to 1012	1.4	19 378 299	462	355 to 569
College	2.6	48 980 090	729	639 to 819	3.4	29 727 643	918	790 to 1047	1.8	19 252 446	553	427 to 680
Marital status												
Married	1.6	66 830 645	529	459 to 598	2.3	47 397 890	749	635 to 864	0.8	19 432 755	308	229 to 386
Coupled	2.8	9 931 284	829	614 to 1045	3.7	6 201 015	1027	738 to 1317	1.9	3 730 270	628	308 to 948
Previously married	1.9	39 176 010	775	635 to 915	3.3	25 715 149	1346	1047 to 1644	1.1	13 460 861	428	294 to 561
Never	3.3	67 647 378	1120	933 to 1307	4.1	49 480 688	1504	1180 to 1829	2.2	18 166 690	661	523 to 798
Household income												
<US$20k	1.6	30 520 443	791	558 to 1024	2.4	20 237 502	1238	747 to 1730	0.9	10 282 941	462	280 to 645
US$20k–<US$35k	1.8	30 842 308	748	558 to 938	2.7	22 791 749	1175	800 to 1551	1.1	8 050 559	368	235 to 502
US$35k–<US$50k	2.0	18 326 261	643	515 to 772	2.8	13 119 633	905	685 to 1126	1.2	5 206 628	372	243 to 502
US$50k–<US$75k	2.5	22 830 730	725	595 to 854	3.5	17 164 445	1050	846 to 1254	1.4	5 666 285	374	218 to 530
≥US$75k	2.9	64 821 319	938	817 to 1060	3.7	44 076 553	1170	990 to 1350	1.8	20 744 766	661	502 to 819
Binge drink												
No	1.1	34 434 557	408	336 to 480	1.4	21 202 088	506	389 to 624	0.8	13 232 469	311	229 to 394
1 x month	5.2	16 405 817	1156	851 to 1461	5.9	11 434 318	1393	904 to 1882	4.2	4 971 500	831	556 to 1105
2–3 x month	9.4	26 721 680	2271	1795 to 2748	11.1	20 158 394	2704	1985 to 3423	6.4	6 563 287	1523	1136 to 1909
≥4 x month	15.0	90 232 145	6754	5872 to 7636	16.1	69 375 465	7518	6365 to 8670	12.5	20 641 654	5002	3774 to 6231
Seatbelt use												
<Always	4.1	52 356 006	1756	1451 to 2061	5.2	42 519 305	2295	1843 to 2746	2.4	9 621 676	853	537 to 1168
Always	1.6	95 464 266	471	420 to 523	2.4	68 994 424	731	629 to 833	1.0	26 469 842	245	208 to 282

*Data are self-reported from US-based 2016 Behavioral Risk Factor Surveillance System. Results weighted by survey population estimates.

or scaling up effective interventions such as expanding the use of publicised sobriety check points; enforcing blood alcohol concentration (BAC) laws and minimum legal drinking age laws; requiring ignition interlocks for all persons convicted of AID and increasing alcohol taxes.[22] Because a significant proportion of adults engaging in AID also does not always wear a seatbelt, primary seatbelt laws that cover all passengers might decrease AID-related crash mortality. Increasing seatbelt use among those engaging in AID is particularly important because alcohol not only increases the risk of a crash but also increases the risk of injury or death in a crash.[23–25]

Promising strategies that have shown effectiveness in other countries, when implemented, could decrease AID and subsequent crash deaths. The National Transportation Safety Board recommended lowering the BAC limit in the USA for drivers from 0.08 to 0.05 to reduce crashes, injuries and deaths caused by AID.[26] A meta-analysis estimated that 1790 lives would be saved each year if all US states adopted a 0.05 BAC limit.[27] Most high-income nations have already enacted a 0.05 illegal BAC limit, and these nations have lower motor vehicle crash fatality rates than the USA.[28] Because our results showed that AID rates were highest among people aged 21–24 years (followed closely by people aged 25–34 years), future strategies that work among young adults are warranted. Although consuming alcohol is generally illegal in the USA for anyone under the age of 21 years, 1.1%, 1.5% and 1.5% of people aged 18–20 years reported engaging in AID during 2014, 2016 and 2018, suggesting the need to support strategies that prevent alcohol use and AID among young adults. It is unclear what effects ride share companies (eg, Uber and Lyft) might have on AID, and this topic deserves evaluation. Studies have shown mixed results with one showing that rideshare operations decreased alcohol-involved crashes only in certain cities[29] while another showed no impact of rideshare services on alcohol-specific crash deaths.[30]

We found that three-quarters of people who engaged in AID attended a routine check-up with a doctor within the previous 2

Table 3 Percentage of adults reporting recent alcohol-impaired driving, annual episodes and episode rates per 1000 population*: 2018

	Overall				Men				Women			
	%	Number of episodes	Rate	95% CI	%	Number of episodes	Rate	95% CI	%	Number of episodes	Rate	95% CI
Total	1.7	146 591 009	574	491 to 657	2.5	113 686 940	917	753 to 1081	0.9	28 691 037	220	181 to 258
Age group (years)												
18–20	1.5	14 477 319	1022	297 to 1748	2.0	9 751 100	1282	35 to 2528	0.9	3 930 733	602	19 to 1186
21–24	3.3	16 749 363	965	713 to 1217	3.3	11 184 271	1304	824 to 1783	3.3	5 467 008	626	456 to 796
25–34	2.6	37 225 113	838	614 to 1062	3.8	27 377 820	1220	807 to 1632	1.4	7 857 798	360	246 to 473
35–54	1.8	50 909 688	611	440 to 783	2.7	42 655 181	1037	693 to 1381	0.9	7 052 808	168	137 to 200
≥55	1.0	27 229 526	284	236 to 331	1.6	22 718 568	514	414 to 615	0.4	4 382 689	85	68 to 102
Race/ethnicity												
White, non-Hispanic	1.8	85 932 814	542	459 to 626	2.6	69 274 351	901	737 to 1066	0.9	16 598 106	204	156 to 252
Black, non-Hispanic	1.7	18 627 941	622	393 to 851	2.2	13 422 500	982	502 to 1461	1.4	4 942 793	305	181 to 428
Hispanic	1.9	29 834 512	731	374 to 1087	2.8	25 163 500	1231	526 to 1936	0.8	3 478 034	171	107 to 236
Other, non-Hispanic	1.0	8 020 174	457	267 to 647	1.4	3 762 475	430	298 to 562	0.6	1 921 479	220	50 to 389
Multiracial, non-Hispanic	1.7	1 670 493	515	310 to 719	2.2	1 016 772	652	319 to 985	1.3	592 400	352	117 to 587
Education												
<High school	1.2	30 740 447	925	456 to 1395	1.9	26 316 359	1550	646 to 2453	0.4	2 405 344	149	35 to 264
High school	1.6	43 951 782	620	446 to 794	2.2	35 839 378	983	662 to 1305	0.8	7 937 196	231	121 to 342
Some college	1.8	33 864 638	429	370 to 488	2.7	24 105 615	663	551 to 775	1.0	9 210 562	217	169 to 265
College	2.0	37 293 548	524	446 to 601	2.9	26 737 839	795	654 to 936	1.2	9 137 935	244	195 to 293
Marital status												
Married	1.3	50 168 793	391	302 to 481	2.0	42 694 561	667	491 to 843	0.5	6 533 846	102	76 to 129
Coupled	2.7	11 029 664	928	592 to 1263	3.6	7 582 307	1259	694 to 1825	1.8	2 784 531	476	190 to 763
Previously married	1.5	36 284 321	718	422 to 1013	2.8	29 350 707	1533	765 to 2300	0.7	5 585 434	179	128 to 229
Never	2.6	47 960 975	765	626 to 904	3.1	33 436 402	987	763 to 1210	2.0	13 619 282	475	331 to 620
Household income												
<US$20k	1.3	24 190 551	680	404 to 957	1.9	15 115 429	1023	435 to 1610	0.8	7 213 592	349	151 to 546
US$20k–<US$35 k	1.5	26 160 247	658	334 to 982	2.1	21 566 204	1165	472 to 1857	1.0	4 403 642	208	147 to 270
US$35k – <US$50k	1.7	15 919 560	593	411 to 775	2.3	13 094 994	972	615 to 1329	1.2	2 732 970	205	145 to 266
US$50k–<US$75k	2.1	18 136 714	569	450 to 688	3.1	14 868 615	893	671 to 1115	1.0	3 268 099	215	161 to 270
≥US$75k	2.3	53 093 373	707	549 to 865	3.3	43 888 900	1074	792 to 1356	1.1	7 672 543	225	177 to 273
Binge drink												
No	0.9	15 808 234	185	151 to 219	1.1	11 396 254	271	204 to 337	0.6	4 405 494	102	83 to 121
1 x month	4.5	10 841 462	780	632 to 929	4.9	6 483 091	805	661 to 949	3.8	4 358 372	749	456 to 1043
2–3 x month	7.6	18 187 536	1560	1303 to 1816	8.6	12 851 703	1762	1422 to 2103	5.8	5 299 387	1217	832 to 1601
≥4 x month	13.6	98 736 945	7410	5850 to 8969	14.7	81 059 671	8606	6475 to 10 738	10.5	13 507 174	3493	2374 to 4611
Seatbelt use												
<Always	4.0	69 568 587	2315	1677 to 2953	5.1	55 796 732	3056	2047 to 4066	2.3	10 464 936	895	516 to 1273
Always	1.4	76 941 398	370	327 to 413	2.1	57 886 887	595	507 to 683	0.8	18 149 230	164	143 to 186

*Data are self-reported from US-based 2018 Behavioral Risk Factor Surveillance System. Results weighted by survey population estimates.

years. This was also true for those who engaged in recent binge drinking and those who engaged in binge drinking and AID. Although not all people will accurately report their alcohol use, routine check-ups offer opportunities for healthcare providers to inquire about and discuss alcohol use and alcohol-related risky behaviours like AID. Alcohol screening and brief intervention (SBI), recommended by the US Preventive Services Task Force for all adults in primary care, is effective at identifying and reducing risky drinking behaviours in the primary care setting.[31] Alcohol SBI guidelines recommend either of two brief screens.[32 33] Healthcare staff can then initiate conversations on drinking limits and apply brief interventions[34] tailored to individual patients' motivations. The SBI intervention step is important but often overlooked. Although most people visiting their doctor are asked about alcohol consumption and binge drinking, most who report binge drinking receive no advice about how to reduce their drinking.[35]

The AID prevalence, episodes and rates reported here are likely underestimates of true AID prevalence in the USA for several reasons. First, BRFSS surveys only those aged ≥18 years, so AID episodes of younger drivers are not included. Second, BRFSS respondents were asked about times when they thought they had had too much to drink, and it is possible that respondents had times where they were impaired but did not recognise it. This might be particularly true for those with a history of AID.[36] Third, respondents could have felt a social stigma associated with AID, which caused them to underreport AID. The 2018 National Survey on Drug Use and Health reported that 8% of the US population aged ≥16 years (which is an estimated 20.5 million people) reported driving under the influence of alcohol in 2018.[37] This estimate is roughly five times greater than the 2018 BRFSS estimate. This is likely partly because the National Survey on Drug Use and Health included 16 and 17-year-old participants and partly because it used Audio Computer-Assisted Self-Interview software (ie, computer-administered survey) methodology, which might heighten respondents' sense of privacy and, thereby, increase their willingness to report AID compared with BRFSS's telephone survey methodology.[38 39] Another study similarly found that passengers who report riding with a drinking driver might provide a more accurate prevalence of AID than drivers.[40] Although BRFSS estimates are likely underestimates, they can help describe the magnitude of AID in the USA. Additionally, other characteristics that BRFSS collects can help describe those who report AID to facilitate prevention efforts.

There are other limitations to this analysis. First, we assumed that what people reported over the past 30 days represented their experience over the past 12 months. This might not be a reasonable assumption, especially because AID is more common during certain seasons and holidays. However, BRFSS interviews took place year-round, likely minimising any seasonal bias. Second, BRFSS only asked about the number of times a person drove after consuming too much alcohol and not the total miles travelled or length of trip time, which might be more relevant but less precise (because it might be harder for people to self-report accurately) measures of exposure. Third, the BRFSS AID question asked whether respondents perceived that they had had too much to drink before driving, and it is unclear how this might relate to crash risk or blood alcohol concentrations. In the USA, it is illegal for a driver to have a blood alcohol concentration of 0.08 g/dL or higher, except in Utah where it is illegal to have a blood alcohol concentration of 0.05 g/dL or higher. However, studies have shown that even small amounts of alcohol (eg , <0.08 g/dL) can reduce motor skills and reaction time.[22 41] Finally, there could be unknown differences between people who report AID and people who die or are injured in an AID-related crash.

AID during the years 2014, 2016 and 2018 was prevalent and linked to other risky behaviours including binge drinking and not always wearing seatbelts. AID is preventable. Because 29% of motor vehicle deaths in 2018 involved an alcohol-impaired driver, eliminating or reducing AID could potentially reduce crash-related deaths by 20%–30%, saving roughly 7000 to 11 000 lives each year.[1] In addition to saving lives, the impact would also be felt by reduced injuries and burdens on healthcare and emergency response systems. States and communities can consider enacting and enforcing AID-reducing strategies at a population-level while healthcare providers in primary care settings can consider addressing AID at an individual level.

What is already known on the subject?

⇒ Alcohol-impaired driving is a risk factor for traffic crashes and their resulting injuries and deaths.
⇒ In 2012, an estimated 1.8% of adults (or 4.2 million adults) in the USA reported alcohol-impaired driving within the past 30 days

What this study adds

⇒ More recent estimates from the years 2014–2018 indicate that reported alcohol-impaired driving remains prevalent. An estimated 1.7%, 2.1% and 1.7% of adults (or 3.7 million, 4.9 million and 4.0 million adults) in the USA reported alcohol-impaired driving in 2014, 2016 and 2018.
⇒ Alcohol-impaired driving was more common among men and among people who binge drink.

Contributors Author EKSS conceived of and designed the study. Authors VB and ACS performed the statistical analyses. Author VB wrote the manuscript. Authors VB, ACS, and EKSS critically revised the manuscript. VB is the guarantor for this work.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Disclaimer The findings and conclusions in this paper are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. Not applicable.

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