

Appendix 1

Risk ratios for death and attributable fractions associated with each study risk factor, compared with not having that risk factor

Driver, pedestrian, or bicyclist blood alcohol level				
Blood alcohol level (g/dl)				Attributable fraction
Blood alcohol level (g/dl)	Age (y)	Sex	Risk ratio	Attributable fraction
0	All	Both	1.00 (Reference)	0
0.01	0–20	Female	1.22	0.18
0.01	0–20	Male	1.42	0.30
0.01	≥21	Both	1.00	0
0.02–0.04	0–20	Female	1.98	0.49
0.02–0.04	0–20	Male	3.44	0.71
0.02–0.04	21–34	Both	2.04	0.51
0.02–0.04	≥35	Both	2.02	0.50
0.05–0.07	0–20	Female	3.56	0.72
0.05–0.07	0–20	Male	9.94	0.90
0.05–0.07	21–34	Both	3.76	0.73
0.05–0.07	≥35	Both	3.70	0.73
0.08–0.09	0–20	Female	5.80	0.83
0.08–0.09	0–20	Male	24.03	0.96
0.08–0.09	21–34	Both	6.25	0.84
0.08–0.09	≥35	Both	6.13	0.84
0.10–0.14	0–20	Female	11.50	0.91
0.10–0.14	0–20	Male	82.73	0.99

Driver, pedestrian, or bicyclist blood alcohol level

Blood alcohol				Attributable
level (g/dl)	Age (y)	Sex	Risk ratio	fraction
0.10–0.14	21–34	Both	12.74	0.92
0.10–0.14	≥35	Both	12.41	0.92
≥0.15	0–20	Female	73.62	0.99
≥0.15	0–20	Male	2371.74	1.00
≥0.15	21–34	Both	88.13	0.99
≥0.15	≥35	Both	84.13	0.99

Not wearing a seat belt

Seat belt	Seat position	Age (years)	Air bag present	Risk ratio	Attributable fraction
Yes	All	All	Yes or no	1.00 (Reference)	0
No	Front	0–49	No	2.33	0.57
No	Front	0–49	Yes	2.55	0.61
No	Front	≥50	No	1.90	0.47
No	Front	≥50	Yes	2.08	0.52
No	Rear	0–49	No	1.95	0.49
No	Rear	≥50	No	1.59	0.37

Not having a front seat airbag

Air bag	Seat position	Age (years)	Seat belt	Risk ratio	Attributable fraction
Yes	All front	All	Yes or	1.00 (Reference)	0

Driver, pedestrian, or bicyclist blood alcohol level

Blood alcohol					Attributable
level (g/dl)	Age (y)	Sex		Risk ratio	fraction
			No		
No	Driver	5–12	No	0.96	–0.04
No	Driver	5–12	Yes	1.05	0.05
No	Driver	13–49	No	1.03	0.03
No	Driver	13–49	Yes	1.12	0.11
No	Driver	≥50	No	1.06	0.06
No	Driver	≥50	Yes	1.16	0.14
No	Front	0–4	No	0.71	–0.41
	passenger				
No	Front	0–4	Yes	0.78	–0.28
	passenger				
No	Front	5–12	No	0.96	–0.04
	passenger				
No	Front	5–12	Yes	1.05	0.05
	passenger				
No	Front	13–49	No	1.06	0.06
	passenger				
No	Front	13–49	Yes	1.16	0.14
	passenger				
No	Front	≥50	No	1.20	0.17
	passenger				

Driver, pedestrian, or bicyclist blood alcohol level

Blood alcohol level (g/dl)				Risk ratio	Attributable fraction
No	Front passenger	≥50	Yes	1.31	0.24

No seat belt, or no air bag, or no seat belt and no airbag

Seat belt	Air bag	Seat position	Age (years)	Risk ratio	Attributable fraction
Yes	Yes	All	All	1.00 (Reference)	0
Yes	No	Driver	5–12	0.96	–0.04
Yes	No	Driver	13–49	1.03	0.03
Yes	No	Driver	≥50	1.06	0.06
Yes	No	Front passenger	0–4	0.71	–0.41
Yes	No	Front passenger	5–12	0.96	–0.04
Yes	No	Front passenger	13–49	1.06	0.06
Yes	No	Front passenger	≥50	1.20	0.17
No	Yes	Driver	0–49	2.33	0.57
No	Yes	Driver	≥50	1.90	0.47
No	Yes	Front passenger	0–49	2.33	0.57

Driver, pedestrian, or bicyclist blood alcohol level

Blood alcohol level (g/dl)				Risk ratio	Attributable fraction
No	Yes	Front passenger	≥50	1.90	0.47
No	No	Driver	5–12	2.45	0.59
No	No	Driver	13–49	2.62	0.62
No	No	Driver	≥50	2.21	0.55
No	No	Front passenger	0–4	1.82	0.45
No	No	Front passenger	5–12	2.45	0.59
No	No	Front passenger	13–49	2.69	0.63
No	No	Front passenger	≥50	2.49	0.60
No	No	Rear seat	0–49	1.95	0.49
No	No	Rear seat	≥50	1.59	0.37
No motorcycle helmet					
Motorcycle helmet	Seat position				
Yes	All			1.00 (Reference)	0
No	Driver			1.54	0.35
No	Rear			1.72	0.42

Driver, pedestrian, or bicyclist blood alcohol level

Blood alcohol Attributable

level (g/dl) Age (y) Sex Risk ratio fraction

No bicycle helmet

Bicycle helmet

Yes 1.00 (Reference) 0

No 2.86 0.65

Appendix 2

Traffic crash deaths attributed to alcohol by age and subgroup, US, 1982–2001

		All deaths			Deaths attributed to anyone's drinking alcohol			Deaths attributed to drinking alcohol by the dead person			Deaths attributed to drinking by someone other than the dead person		
Subgroup		Count	Rate	Count	Rate	Alcohol (%)†	Count	Rate	Alcohol (%)†	Count	Rate	Alcohol (%)†	
All		858,741	16.75	366,606	7.15	43	245,830	4.80	29	144,359	2.82	17	
Age group (years)	0–15	67,867	5.73	14,331	1.21	21	1482	0.13	2	13,066	1.10	19	
	16–20	130,933	34.39	57,446	15.09	44	32,019	8.41	24	28,210	7.41	22	
	21–30	210,018	25.92	122,395	15.11	58	87,720	10.83	42	42,943	5.30	20	
	31–64	321,283	15.18	151,541	7.16	47	113,482	5.36	35	49,303	2.33	15	
	65+	128,640	20.30	20,893	3.30	16	11,127	1.76	9	10,837	1.71	8	

Subgroup	All deaths		Deaths attributed to anyone's drinking alcohol			Deaths attributed to drinking alcohol by the dead person			Deaths attributed to drinking by someone other than the dead person		
	Count	Rate	Count	Rate	Alcohol (%)†	Count	Rate	Alcohol (%)†	Count	Rate	Alcohol (%)†
	Persons	443,655	8.66	197,642	3.86	45	175,204	3.42	39	33,350	0.65
Drivers	213,667	4.17	79,116	1.54	37	0	0	0	79,116	1.54	37
Passengers	121,135	2.36	53,467	1.04	44	42,354	0.83	35	20,893	0.41	17
Pedestrians	63,811	1.24	31,514	0.61	49	25,297	0.49	40	8,393	0.16	13
Motorcyclists	16,473	0.32	4866	0.09	30	2975	0.06	18	2,606	0.05	16
Bicyclists											

*Driver and passenger categories exclude motorcyclists. Deaths, rates, and proportions attributed to drinking by each person and to drinking by another person sum to more than all alcohol deaths, rates, and proportions, because some deaths can be attributed to drinking by more than one person.

†Alcohol (%) = $100 \times \text{alcohol deaths/all deaths}$.

Rates per 100,000 person-years.*

Appendix 3

Traffic crash deaths attributed to not wearing a seat belt and not having an airbag: US data for vehicle occupants, 1982–2001

Age (years)	Deaths of vehicle occupants	Deaths attributed to no seat belt			Deaths of vehicle front occupants	Deaths attributed to no air bag*		
		Deaths				Deaths		
		Deaths	Rate	(%)†		Deaths	Rate	(%)†
All	641,114	259,239	5.06	40	564,124	31,377	0.61	6
0–15	37,530	14,443	1.22	38	18,455	–1337‡	–0.11‡	–7‡
16–20	106,395	48,061	12.62	45	92,970	4386	1.15	5
21–30	158,393	73,574	9.08	46	144,439	6325	0.78	4
31–64	239,574	96,330	4.55	40	216,542	12,617	0.60	6
65+	99,222	26,831	4.23	27	91,718	9387	1.48	10

*Airbag analysis limited to front occupants in vehicles of the type that customarily have air bags.

†Deaths (%) = attributed deaths/all deaths.

‡Negative attributed deaths are lives saved among the young by not being exposed to air bags, as air bags were a net hazard to young children. Rates per 100,000 person-years.

Appendix 4

Traffic crash deaths attributed to not wearing a helmet among motorcycle riders and bicyclists by age: US data, 1982–2001

Age (years)	Deaths of motorcycle riders	Deaths attributed to no motorcycle helmet			Deaths of bicyclists	Deaths attributed to no bicycle helmet		
		Deaths		Deaths (%)*		Deaths		Deaths (%)*
		Deaths	Rate			Deaths	Rate	
All	63,811	12,095	0.24	19	16,473	10,552	0.21	64
0–15	1,896	434	0.04	23	6523	4210	0.36	65
16–20	11,016	2225	0.58	20	1744	1125	0.30	65
21–30	26,356	5040	0.62	19	2264	1455	0.18	64
31–64	23,608	4258	0.20	18	4817	3045	0.14	63
65+	935	138	0.02	15	1125	717	0.11	64

*Deaths (%) = Attributed deaths/all deaths.
Rates per 100,000 person-years.