

S3 Table. Summary of the previous studies on the associations between alcohol drinking and colorectal cancer in Korea

Study	Study design	Study period	Study subjects					RR/OR (95% CIs)	Confounding variables considered	
			Type and source	Cancer site	Sex	No.	No. of cases			No. of controls
Kim JI et al. (2003) [5]	Case-control	Not specified	Hospital based (Ilsan Paik Hospital, Goyang, Korea); 125 cases and 247 controls	Colon	Both sexes		73 52	161 < 2 (times/wk) 86 ≥ 2	1.00 1.37 (0.87-2.32)	Matched by age (±5 years) and sex; pair-matched into a 2 to 1 ratio; adjusted for age, sex, drinking habits, smoking and diet habits to control the effect of potential confounding environmental factors.
Hong YC et al. (2005) [18]	Case-control	2001 to 2003	Hospital-based (Inha University Hospital, Incheon, South Korea); 209 cases and 209 controls; controls derived from Incheon Health Examinee Cohort (15,540 participants), which consisted of subjects who voluntarily visited the health-screening clinic at the same hospital	Colorectum	Both sexes		145 64	157 < 80 (g/wk) 52 ≥ 80	1.00 2.60 (1.46-4.62)	Matched by age (±3 years) and sex; adjusted for smoking, dietary habits and exercise
Lim HJ et al. (2008) [8]	Prospective cohort	1993 to 1998; aged 65 years or more; linking data from the Korean Medical Insurance Corporation (KMIC) until December 31, 2002	Population-based dynamic cohort (Korea Elderly Phamacepidemilogic Cohort [KEPEC]); 4,834 men and 9,470 women	Colorectum	Both sexes	8,783 1,615 3,906	68 18 26	Never drinker Former drinker Current drinker	1.00 1.13 (0.63-2.03) 0.64 (0.39-1.05)	Adjusted for age and sex
Lim HJ et al. (2008) [8]	Prospective cohort	1993 to 1998; aged 65 years or more; linking data from the Korean Medical Insurance	Population-based dynamic cohort (KEPEC); 4,834 men and 9,470 women	Colorectum	Both sexes	9,666 581 1,064 383 903	73 2 11 3 8	Never drinker ≤ 2 (times/month) ≤ 4 ≤ 8 ≤ 12	1.00 0.42 (0.10-1.73) 1.21 (0.63-2.32) 0.98 (0.30-3.13) 0.99 (0.46-2.12)	Adjusted for age and sex

		Corporation (KMIC) until December 31, 2002				1,707	15	≤ 30	0.86 (0.47-1.59)	
Lim HJ et al. (2008) [8]	Prospective cohort	1993 to 1998; aged 65 years or more; linking data from the KMIC until December 31, 2002	Population-based dynamic cohort (KEPEC); 4,834 men and 9,470 women	Colorectum	Both sexes	10,214 2,400 716 244 724	74 14 8 2 8	Never drinker ≤ 24 (g/day) ≤ 48 ≤ 72 > 72	1.00 0.62 (0.35-1.12) 1.13 (0.52-2.45) 1.07 (0.26-4.48) 1.15 (0.28-4.72)	Adjusted for age and sex
Kim J et al. (2009) [9]	Case-control	2001 to 2004	Hospital-based (two university hospitals in Seoul, Korea)	Colorectum	Men		101 97 163	96 < 5 (g/day) 82 5-29 92 ≥ 30	1.00 1.12 (0.70-1.82) 1.68 (1.04-2.72)	Crude OR; Matched by age
Kim J et al. (2009) [9]	Case-control	2001 to 2004	Hospital-based (two university hospitals in Seoul, Korea)	Colorectum	Women		217 16 2	228 < 5 (g/day) 9 5-29 2 ≥ 30	1.00 1.87 (0.22-15.74) 1.05 (0.12-8.85)	Crude OR; Matched by age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Proximal colon	Men	258,733 181,693 249,133 118,099 61,663	176 93 137 70 60	Never drinker 2-3 times/mo 1-2 times/wk 3-4 times/wk Almost everyday	1.00 1.10 (0.80-1.40) 1.10 (0.90-1.40) 1.10 (0.80-1.40) 1.20 (0.90-1.70)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Distal colon	Men	258,733 181,693 249,133 118,099 61,663	230 119 194 130 78	Never drinker 2-3 times/mo 1-2 times/wk 3-4 times/wk Almost everyday	1.00 1.10 (0.90-1.40) 1.40 (1.10-1.70) 1.70 (1.30-2.10) 1.20 (0.90-1.50)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Rectum	Men	258,733 181,693 249,133 118,099 61,663	525 280 348 218 164	Never drinker 2-3 times/mo 1-2 times/wk 3-4 times/wk Almost everyday	1.00 1.10 (0.90-1.30) 1.00 (0.90-1.20) 1.20 (1.00-1.40) 1.10 (0.90-1.30)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Proximal colon	Women	332,433 38,041 17,927 3,916 3,103	206 19 5 5 1	Never drinker 2-3 times/mo 1-2 times/wk 3-4 times/wk Almost everyday	1.00 1.00 (0.60-1.60) 0.50 (0.20-1.20) 1.80 (0.70-4.40) 0.40 (0.10-2.60)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea	Distal colon	Women	332,433 38,041	201 17	Never drinker 2-3 times/mo	1.00 0.90 (0.50-1.40)	Adjusted for age

		up	Medical Insurance Corporation; 869,725 men and 395,501 women			17,927 3,916 3,103	5 1 1	1-2 times/wk 3-4 times/wk Almost everyday	0.50 (0.20-1.20) 0.40 (0.10-2.80) 0.40 (0.10-3.00)	
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Rectum	Women	332,433 38,041 17,927 3,916 3,103	446 54 26 9 16	Never drinker 2-3 times/mo 1-2 times/wk 3-4 times/wk Almost everyday	1.00 1.30 (1.00-1.70) 1.20 (0.80-1.70) 1.50 (0.80-3.00) 2.80 (1.70-4.70)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Proximal colon	Men	258,733 193,658 286,245 126,758	176 125 172 61	Never drinker Less than half bottle One bottle of Korean distilled spirits More than one bottle of Korean distilled spirits	1.00 1.00 (0.80-1.20) 1.30 (1.00-1.60) 1.20 (0.90-1.60)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Distal colon	Men	258,733 193,658 286,245 126,758	230 183 251 86	Never drinker Less than half bottle One bottle of Korean distilled spirits More than one bottle of Korean distilled spirits	1.00 1.10 (0.90-1.30) 1.60 (1.30-1.90) 1.50 (1.20-2.00)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Rectum	Men	258,733 193,658 286,245 126,758	525 431 416 171	Never drinker Less than half bottle One bottle of Korean distilled spirits More than one bottle of Korean distilled spirits	1.00 1.10 (0.90-1.20) 1.10 (0.90-1.20) 1.20 (1.00-1.40)	Adjusted for age
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Proximal colon	Women	332,433 50,104	206 23	Never drinker Less than half bottle of	1.00 0.80 (0.50-1.30)	Adjusted for age

			Corporation; 869,725 men and 395,501 women			8,724	6	Korean distilled spirits More than one bottle of Korean distilled spirits	1.60 (0.70-3.50)	
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Distal colon	Women	332,433 50,104	201 21	Never drinker Less than half bottle of Korean distilled spirits	1.00 0.70 (0.50-1.20)	Adjusted for age
						8,724	2	More than one bottle of Korean distilled spirits	0.50 (0.10-1.90)	
Shin A et al. (2011) [10]	Prospective cohort	1996 to 1997; 7 years of follow-up	Population-based cohort; Korea Medical Insurance Corporation; 869,725 men and 395,501 women	Rectum	Women	332,433 50,104	446 85	Never drinker Less than half bottle of Korean distilled spirits	1.00 1.40 (1.10-1.70)	Adjusted for age
						8,724	15	More than one bottle of Korean distilled spirits	1.70 (1.00-2.80)	
Kim J et al. (2012) [11]	Case-control	1998 to 2004	Hospital-based (two university hospitals in Seoul, Korea); 787 cases and 656 controls	Colorectum	Both sexes		429 150 208	422 < 5 (g/day) 121 5-29 113 ≥ 30	1.00 1.22 (0.88-1.69) 1.76 (1.26-2.46)	Adjusted for age, sex, family history, multivitamin use, BMI, smoking status, total energy and folate intake.
Kim J et al. (2012) [11]	Case-control	1998 to 2004	Hospital-based (two university hospitals in Seoul, Korea); 787 cases and 656 controls	Colon	Both sexes		167 101 95	422 < 5 (g/day) 121 5-29 113 ≥ 30	1.00 1.83 (1.21-2.75) 2.41 (1.57-3.69)	Adjusted for age, sex, family history, multivitamin use, BMI, smoking status, total energy and folate intake.
Kim J et al. (2012) [11]	Case-control	1998 to 2004	Hospital-based (two university hospitals in Seoul, Korea); 787 cases and 656 controls	Rectum	Both sexes		140 90 100	422 < 5 (g/day) 121 5-29 113 ≥ 30	1.00 0.88 (0.57-1.37) 1.65 (1.08-2.50)	Adjusted for age, sex, family history, multivitamin use, BMI, smoking status, total energy and folate intake.
Shin A et al. (2014) [19]	Prospective cohort	1996 to 1997	Population-based cohort; Korea Medical Insurance Corporation; 846,559	Proximal colon	Men	Not specified	Not specified	0 (g/day) 1-14.9 15-24.9	1.00 1.10 (1.03-1.18) 1.21 (1.13-1.31)	Adjusted for age, height, family history for cancer, and BMI

Shin A et al. (2014) [19]	Prospective cohort	1996 to 1997	men and 479,449 women Population-based cohort; Korea Medical Insurance Corporation; 846,559 men and 479,449 women	Colon	Men	Not specified	Not specified	≥ 25	1.26 (1.18-1.35)	Adjusted for age, height, family history for cancer, and BMI
								0 (g/day)	1.00	
								1-14.9	1.18 (1.07-1.30)	
								15-24.9	1.30 (1.16-1.45)	
Shin A et al. (2014) [19]	Prospective cohort	1996 to 1997	men and 479,449 women Population-based cohort; Korea Medical Insurance Corporation; 846,559 men and 479,449 women	Right colon	Men	Not specified	Not specified	≥ 25	1.31 (1.19-1.45)	Adjusted for age, height, family history for cancer, and BMI
								0 (g/day)	1.00	
								1-14.9	1.14 (0.98-1.33)	
								15-24.9	1.20 (1.00-1.43)	
Shin A et al. (2014) [19]	Prospective cohort	1996 to 1997	men and 479,449 women Population-based cohort; Korea Medical Insurance Corporation; 846,559 men and 479,449 women	Left colon	Men	Not specified	Not specified	≥ 25	1.24 (1.06-1.45)	Adjusted for age, height, family history for cancer, and BMI
								0 (g/day)	1.00	
								1-14.9	1.21 (1.07-1.37)	
								15-24.9	1.37 (1.19-1.58)	
Shin A et al. (2014) [19]	Prospective cohort	1996 to 1997	men and 479,449 women Population-based cohort; Korea Medical Insurance Corporation; 846,559 men and 479,449 women	Rectum	Men	Not specified	Not specified	≥ 25	1.38 (1.21-1.56)	Adjusted for age, height, family history for cancer, and BMI
								0 (g/day)	1.00	
								1-14.9	1.05 (0.96-1.16)	
								15-24.9	1.16 (1.04-1.29)	
Shin A et al. (2014) [19]	Prospective cohort	1996 to 1997	men and 479,449 women Population-based cohort; Korea Medical Insurance Corporation; 846,559 men and 479,449 women	Rectum	Women	Not specified	Not specified	≥ 25	1.22 (1.11-1.34)	Adjusted for age, height, meat consumption frequency, and frequency of alcohol consumption
								0 (g/day)	1.00	
								1-14.9	1.00 (0.83-1.20)	
Cho S et al. (2015) [13]	Prospective cohort	1993 to 2005; linking death certificated database of the Statistics Korea until December 31, 2011 (median follow-up of 11.2 years).	men and 479,449 women Population-based	Colorectum	Men	1,845	22	Never drinker	1.00	Adjusted for body mass index (kg/m ² ; < 18.5, 18.5-22, 23-24, ≥ 25), moderate physical activity (hr/wk; never, 0.5-6, ≥ 7), and cigarette smoking history (never smoker, former smoker, current smoker).
						783	10	Former drinker	0.92 (0.43-1.96)	
						4,827	79	Current drinker	1.70 (1.05-2.76)	
Cho S et al. (2015) [13]	Prospective cohort	1993 to 2005; linking death	Population-based	Colorectum	Women	8,660	90	Never drinker	1.00	Adjusted for body mass index (kg/m ² ; < 18.5, 18.5-22, 23-
						234	3	Former drinker	1.29 (0.40-4.16)	

		; 7,488 men and 11,034 women	certificated database of the Statistics Korea until December 31, 2011 (median follow-up of 11.2 years).			2,072	15	Current drinker	0.85 (0.49-1.47)	24, ≥ 25), moderate physical activity (hr/wk; never, 0.5-6, ≥ 7), and cigarette smoking history (never smoker, former smoker, current smoker).
Cho S et al. (2015) [13]	Prospective cohort	1993 to 2005; linking death certificated database of the Statistics Korea until December 31, 2011 (median follow-up of 11.2 years).	Population-based	Colorectum	Men	1,845 704 2,111 2,377	22 1 23 60	Never drinker < 15 (year) 15-29 ≥ 30	1.00 0.31 (0.04-2.27) 1.32 (0.72-2.44) 1.93 (1.17-3.18)	Adjusted for body mass index (kg/m ² ; < 18.5, 18.5-22, 23-24, ≥ 25), moderate physical activity (hr/wk; never, 0.5-6, ≥ 7), and cigarette smoking history (never smoker, former smoker, current smoker).
Cho S et al. (2015) [13]	Prospective cohort	1993 to 2005; linking death certificated database of the Statistics Korea until December 31, 2011 (median follow-up of 11.2 years).	Population-based	Colorectum	Women	8,660 975 793 284	90 8 7 1	Never drinker < 15 (year) 15-29 ≥ 30	1.00 1.09 (0.53-2.26) 0.96 (0.44-2.08) 0.33 (0.05-2.34)	Adjusted for body mass index (kg/m ² ; < 18.5, 18.5-22, 23-24, ≥ 25), moderate physical activity (hr/wk; never, 0.5-6, ≥ 7), and cigarette smoking history (never smoker, former smoker, current smoker).
Cho S et al. (2015) [13]	Prospective cohort	1993 to 2005; linking death certificated database of the Statistics Korea until December 31, 2011 (median follow-up of 11.2 years).	Population-based	Colorectum	Men	1,845 1,823 1,282 1,723	22 24 20 38	Never drinker < 10 (g/day) 10-29 ≥ 30	1.00 1.28 (0.71-2.31) 1.77 (0.96-3.26) 2.24 (1.31-3.84)	Adjusted for body mass index (kg/m ² ; < 18.5, 18.5-22, 23-24, ≥ 25), moderate physical activity (hr/wk; never, 0.5-6, ≥ 7), and cigarette smoking history (never smoker, former smoker, current smoker).
Cho S et al. (2015) [13]	Prospective cohort	1993 to 2005; linking death certificated database of the Statistics Korea until December 31, 2011 (median follow-up of 11.2 years).	Population-based	Colorectum	Women	8,660 1,408 264 151	90 9 2 1	Never drinker < 10 (g/day) 10-29 ≥ 30	1.00 0.82 (0.41-1.63) 0.95 (0.23-3.87) 0.76 (0.11-5.44)	Adjusted for body mass index (kg/m ² ; < 18.5, 18.5-22, 23-24, ≥ 25), moderate physical activity (hr/wk; never, 0.5-6, ≥ 7), and cigarette smoking history (never smoker, former smoker, current smoker).

Jung YS et al. (2016) [20]	Cross-sectional	2010 to 2011	Total Healthcare Center of Kangbuk Samsung Hospital, Seoul and Suwon	Colorectum	Both sexes	17,480	1,384	≤ 6.25 g per day	1.00	Adjusted for age, sex, family history of colorectal cancer, body mass index, aspirin use and smoking status
						5,984	465	6.26-12.5	0.87 (0.77-0.97)	
						5,635	476	12.6-49.9	0.92 (0.82-1.03)	
Choi YJ et al. (2016) [21]	Retrospective cohort	2009 to 2012	National Health Insurance Corporation (NHIC)	Colorectum	Both sexes	12,396,688	89,613	≥ 50.0	0.94 (0.81-1.09)	Adjusted for age, sex, exercise, income, BMI, diabetes mellitus, and smoking status
						8,994,551	50,974	10-29 g per day	1.12 (1.10-1.13)	
						1,788,073	14,281	≥ 30	1.32 (1.30-1.35)	
Kim H et al. (2019) [16]	Case-control	2007 to 2014	National Cancer Center (NCC)	Colorectum	Both sexes	1,268	643	Ever drinker	1.00	Adjusted for prior BMI, physical activity, smoking, alcohol drinking and dietary inflammatory index
						552	279	Never drinker	0.81 (0.64-1.03)	
Lee S et al. (2019) [17]	Case-control	2010 to 2013	NCC	Colorectum	Women	569	173	Never drinker	1.00	Adjusted for age (continuous), education level (middle school or less, high school, college or more), family history of CRC (yes/no), history of diabetes (yes/no), BMI (<18.5, 18.5-24.9, 25), regular physical activity (yes/no), smoking pack-year (continuous), total energy intake (continuous), calcium intake (continuous), folate intake (continuous), red and processed meat intake (continuous)
44	26	Former smoker	2.54 (1.39-4.66)							
283	100	Current smoker	1.31 (0.93-1.84)							

BMI, body mass index; CI, confidence interval; CRC, colorectal cancer; OR, odds ratio; RR, relative risk.