Health Consequences of Alcohol Drinking & Attributable Medical Care Cost in Korea: Korean Cancer Prevention Study

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Sun Ha Jee
Department of Epidemiology and Health Promotion
Graduate School of Public health, Yonsei University
Seoul, Korea

h·well NHIS National Health Insurance Service

연세대학교 YONSEI UNIVERSITY

Contents

- Collaborative study with National Health Insurance Service (NHIS)
- Health effect of alcohol drinking
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Soju is a distilled alcoholic beverage native to Korea, and is similar to liquor or Japanese shochu.

In 1985, at the time **the Kangwha Cohort** survey began, the pure alcohol content was 25% for Soju.

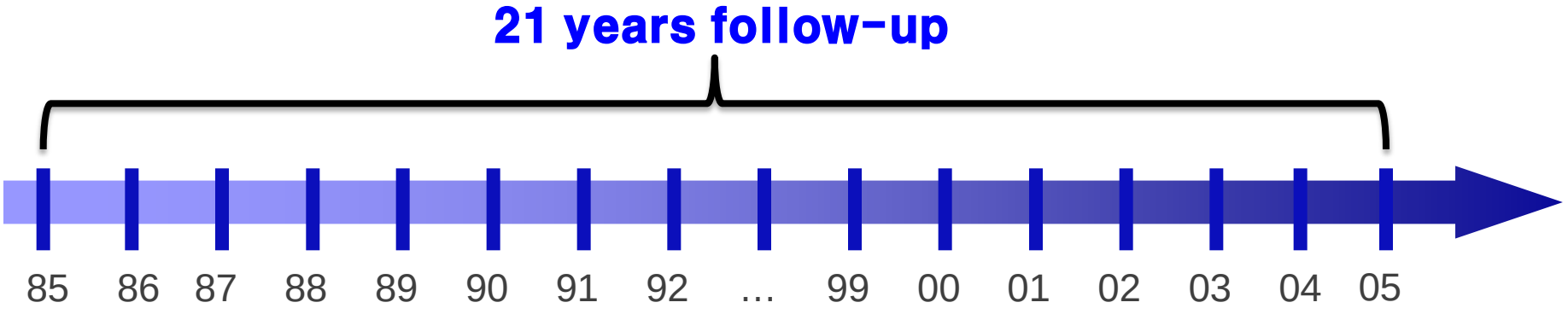
In 1985, **Soju** drinkers accounted for 53.4% of male drinkers, Makkoli drinkers for 44.2%, and beer and other alcohol drinkers for 2.4%.

* Makkoli is an unfiltered alcoholic beverage.

The Kangwha Cohort Study

The Kangwha Cohort was formed in March 1985.
Kangwha County consists of several islands approximately 50 km west from Seoul.

Study participants were 6,291 aged 55 and older



Alcohol Consumption and Digestive Cancer Mortality in Koreans: The Kangwha Cohort Study

Sang-Wook Yi[1], Jae Woong Sull[2], John Alderman Linton[3], Chung Mo Nam[4], and Heechoul Ohrr[2,4]

[1]Department of Preventive Medicine and Public Health, Kwandong University College of Medicine, Gangneung, Korea
[2]Institute for Health Promotion, Graduate School of Public Health, Yonsei University, Seoul, Korea
[3]Department of Family Medicine, Yonsei University College of Medicine, Seoul, Korea
[4]Department of Preventive Medicine and Public Health, Yonsei University College of Medicine, Seoul, Korea

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Heavy drinking: 540g/week

ABSTRACT

Background: Alcohol consumption is a known risk factor for cancers of the mouth, esophagus, liver, colon, and breast. In this study, we examined the association between alcohol consumption and digestive cancer mortality in Korean men and women.

Methods: A cohort of 6291 residents of Kangwha County who were aged 55 years or older in March 1985 were followed to 31 December 2005—a period of 20.8 years. We calculated the relative risks of cancer mortality with respect to the amount of alcohol consumed. Cox proportional hazard model was used to adjust for age at entry, smoking, ginseng intake, education status, and pesticide use.

Results: In men, the risks of mortality from esophageal cancer (relative risk [RR], 5.62; 95% confidence interval [CI], 1.45–21.77) and colon cancer (RR, 4.59; 95% CI, 1.10–19.2) were higher among heavy drinkers, as compared with abstainers. The risks of mortality from colon cancer and bile duct cancer rose with increasing alcohol consumption; these trends were positive and statistically significant ($P = 0.04$ and $P = 0.02$, respectively). When participants were stratified by type of alcoholic beverage, *soju* drinkers had higher risks of mortality from esophageal cancer and colon cancer than *makkoli* drinkers. In women, the risk of digestive cancer mortality was higher among alcohol drinkers than abstainers, but this difference was not statistically significant.

Conclusions: Alcohol consumption increases mortality from esophageal cancer and colon cancer in men.

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Table 3. Number of deaths and adjusted[a] relative risks of death from all digestive cancers and site-specific cancers among men, by amount of alcohol consumed weekly

Type of cancer	Alcohol consumption				
	None (*n* = 947)	Low (<138 g/week) (*n* = 650)	Moderate (<540 g/week) (*n* = 538)	High (≥540 g/week) (*n* = 561)	*P* for trend
All digestive cancers					
No. of cases	71	60	44	55	
RR (95% CI)	1.00	1.18 (0.83–1.69)	1.06 (0.73–1.56)	1.26 (0.88–1.82)	0.26
Esophageal cancer					
No. of cases	3	3	4	9	
RR (95% CI)	1.00	1.04 (0.17–6.32)	2.45 (0.53–11.29)	5.62 (1.45–21.77)	0.09
Stomach cancer					
No. of cases	35	29	16	20	
RR (95% CI)	1.00	1.19 (0.71–1.99)	0.82 (0.45–1.50)	1.01 (0.57–1.77)	0.71
Liver cancer					
No. of cases	13	8	8	8	
RR (95% CI)	1.00	0.91 (0.38–2.22)	0.94 (0.38–2.28)	0.79 (0.31–2.01)	0.11
Colon cancer					
No. of cases	3	4	4	6	
RR (95% CI)	1.00	1.13 (0.19–6.83)	2.98 (0.65–13.7)	4.59 (1.10–19.2)	0.04
Rectal cancer					
No. of cases	3	4	0	2	
RR (95% CI)	1.00	1.86 (0.41–8.45)	—	1.01 (0.16–6.25)	0.75
Colorectal cancer					
No. of cases	6	8	4	8	
RR (95% CI)	1.00	1.57 (0.50–4.91)	1.33 (0.37–4.82)	2.61 (0.88–7.78)	0.14
Bile duct cancer					
No. of cases	3	2	2	3	
RR (95% CI)	1.00	1.67 (0.23–12.0)	2.01 (0.28–14.6)	3.06 (0.49–19.1)	0.02
Pancreatic cancer					
No. of cases	2	6	3	5	
RR (95% CI)	1.00	4.68 (0.94–23.4)	2.77 (0.46–16.9)	3.77 (0.68–21.0)	0.48

[a]Adjusted for age (year of recruitment), history of chronic disease, smoking habit, ginseng intake, pesticide use, body mass index, and education status, using the Cox proportional hazard model.

Abbreviations: RR, relative risk; CI, confidence interval.

Binge Drinking and Mortality From All Causes and Cerebrovascular Diseases in Korean Men and Women

A Kangwha Cohort Study

Jae Woong Sull, PhD; Sang-Wook Yi, MD, PhD; Chung Mo Nam, PhD; Heechoul Ohrr, MD, PhD

Background and Purpose—The purpose of this study was to examine the association between binge drinking and risks of mortality due to all causes of death with a focus on cerebrovascular disease in Korean men and women.

M

Binge drinking was defined as having 6 drinks of one occasion.

C

(hazard ratio, 1.86; 95% CI, 1.16 to 2.99) and hemorrhagic stroke (hazard ratio, 3.59; 95% CI, 1.58 to 8.39). Female binge drinkers also showed an increased risk of mortality from cardiovascular disease as compared with female nondrinkers, but the outcome was not statistically significant.

Conclusions—The results of this study suggest that frequent binge drinking has a harmful effect on hemorrhagic stroke in Korean men. These findings need to be confirmed in further studies. (***Stroke*. 2009;40:2953-2958.**)

Key Words: alcohol consumption ■ binge drinking ■ hemorrhagic stroke mortality

Table 4. No. of Deaths and Adjusted* Hazard Ratios of Death From All Causes and Cause-Specific Diseases Among Male Binge Drinkers According to the Frequency of Binge Drinking

Cause of Death	Nondrinkers (n=906)	Frequency of Binge Drinking		
		Few Times a Month (n=50)	Few Times a Week (n=302)	Daily (n=182)
All causes				
No. of cases	693	35	217	147
HR (95% CI)	1.00	1.01 (0.72–1.42)	0.99 (0.84–1.16)	1.33 (1.11–1.60)
Total atherosclerotic cardiovascular disease				
No. of cases	111	9	38	30
HR (95% CI)	1.00	1.58 (0.80–3.13)	1.00 (0.68–1.46)	1.73 (1.15–2.62)
Ischemic heart disease				
No. of cases	16	1	2	2
HR (95% CI)	1.00	1.25 (0.16–9.51)	0.38 (0.09–1.70)	0.83 (0.19–3.71)
Total stroke				
No. of cases	78	7	29	23
HR (95% CI)	1.00	1.72 (0.79–3.75)	1.07 (0.69–1.67)	1.86 (1.16–2.99)
Hemorrhagic stroke				
No. of cases	13	1	5	8
HR (95% CI)	1.00	1.44 (0.19–11.1)	1.03 (0.36–2.97)	3.39 (1.38–8.35)
Ischemic stroke				
No. of cases	16	0	3	1
HR (95% CI)	1.00	...	0.54 (0.15–1.91)	0.45 (0.06–3.45)
Hypertensive disease				
No. of cases	16	1	6	5
HR (95% CI)	1.00	1.27 (0.17–9.85)	1.19 (0.44–3.20)	2.22 (0.78–6.34)

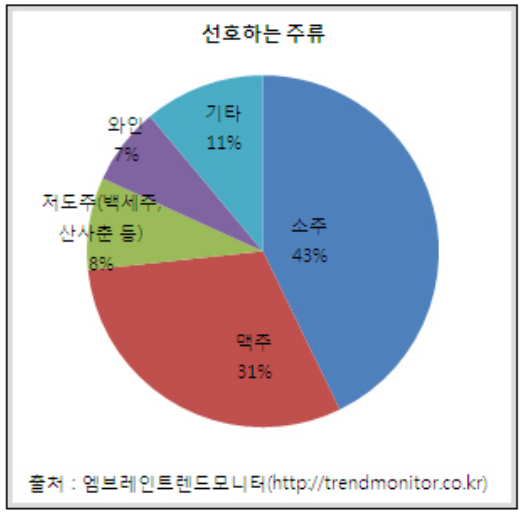
*Adjusted for age (year of recruitment), history of chronic disease, smoking habits, body mass index, hypertension, and education status using the Cox proportional hazard model.

HR indicates hazard ratio.

오류신고 프린트 가 가

우리나라 국민 맥주보다 '소주' 선호

2009년 08월 22일 (토) 15:57:34 김고은 기자 kkony@wednews.co.kr



우리나라 국민은 맥주보다는 '소주'를 선호했고 평균 '주 2~3회' 술을 마시는 비율이 가장 높았으며, 주로 '금요일'에 '동성친구' '2~3명'과 술을 자주 마시는 것으로 나타났다.

또 도수가 낮은(16도) 소주에 대해 64.8%가 '구매해 마셔볼 의사가 있다'고 밝혔다.

시장조사 전문기업 엠브레인트렌드모니터가 전국의 만 19세 이상 남녀 1,086명을 대상으로 '주류 소비 행태와 저도주 소비자 조사'를 실시한 결과, 42.8%가 가장 선호하는 술로 '소주'를 꼽았다. 이어 '맥주'(30.5%), '저도주'(8.5%), '와인'(7.1%) 순이었다.

술을 마시는 빈도는 '주 2~3회'가 37%로 가장 많았고, '주 1회' 25.2%, '월 2~3회' 17.3%, '거의 매일'도 8.7%에 달했다.

또, 술을 가장 자주 마시는 요일은 역시 금요일(42.1%)이었다. 이어 토요일'(21.1%), 목요일'(5.7%) 순으로 집계됐으며, 정해진 요일이 따로 없이 마신다는 응답도 18.5%나 차지했다.

한편 술을 함께 마시는 사람은 '동성친구'(32.3%)와 '직장 동료'(27.9%)로 집계됐다.

웨딩뉴스 보도자료 및 기사제보 webmaster@wednews.co.kr

Survey on Alcohol drinking in 2009

Soju 43%
Beer 31%
Wine 7%
Other 19%

Contents

- **Collaborative study with NHIS**
- **Health effect of alcohol drinking**
- **Attributable medical cost of alcohol drinking**

Yonsei University-NHIS Collaborative Study

Collaborative study

- Project title

  KCPS, Korean Cancer Prevention Study

- Project period

  Since September 1st, 2001 ~ present

- Researchers

  Yonsei University: Sun Ha Jee, Heechoul Ohrr, Heejin Kim, Yejin Mok

  NHIS: Young Duk Yun, Soo Jin Bak, Dongkoog Son, Eun-Jeong Han

- Study subjects: KMIC insured civil servants and private teachers and their dependents, 1992-1999

- NHIC: Official collaborative study has begun since 2001

- NHIS: 2013

Timeline

2001

2001.08.27. Collaborative study proposal
2001.08.29 1st contract (2001.09.01 – 2002.08.31.)

2002

2002.12.02. Contract extended (2002.12.01 – 2004.11.30.)

2005

2005.11.30. Contract extended (2005.12.01 – 2010.12.31.)

2011

2011.06.01. Contract extended (2011.06.01-2013.5.31)

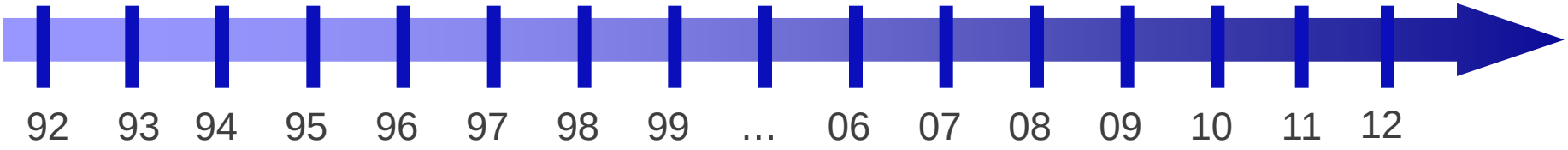
2013

2013.06.01. Contract extended (2013.06.01-2015.05.31.)

Korean Cancer Prevention Study (KCPS)

Design of KCPS

- 19-year prospective cohort study
- Participants enrolled through the National Health Insurance Service (NHIS)
- Insured and dependents (N=1,329,525), ages 30 and older
- Answered questionnaires in 1992-1995 and subsequent years
- Follow-up by record linkage to NHIS



Baseline

Participation Rate: 95%

Morbidity	
All cancers	146,835
All cardiovascular diseases	182,013
Mortality	
All-causes	173,835
All cancers	62,219
All cardiovascular diseases	39,531

Alcohol Consumption

Total daily alcohol consumption:

Number of glasses per week
Most popular alcoholic beverage, “Soju”
One glass of Soju contains about 12 g of ethanol

Alcohol consumption per day:

No drinking (0 g),
Light drinking (1–24.9 g),
Moderate drinking (25– 49.9 g),
Heavy drinking (50–99 g), and
Very heavy drinking (100 g or more).

General Characteristics of KCPS Subject, 1992–1995

		Men	Women
Age, year		45.0	49.4
Smoking %	Non	20	94
	Ex	20	2
	Current	60	4
Drinking %	Non	23	85
	1- 24 g	58	14
	25-49 g	11	1
	50-99 g	6	0
	≥ 100 g	2	0

Contents

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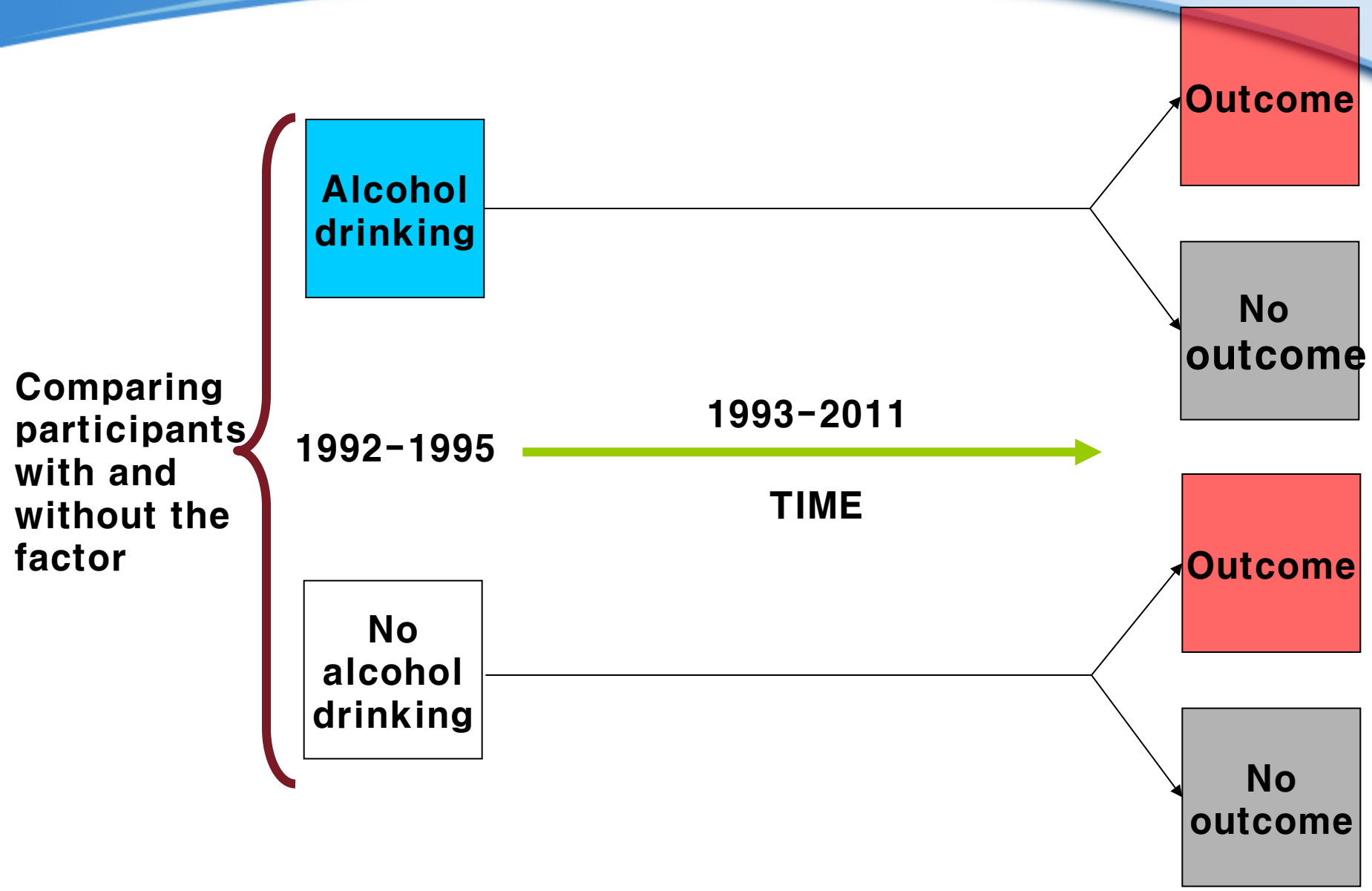
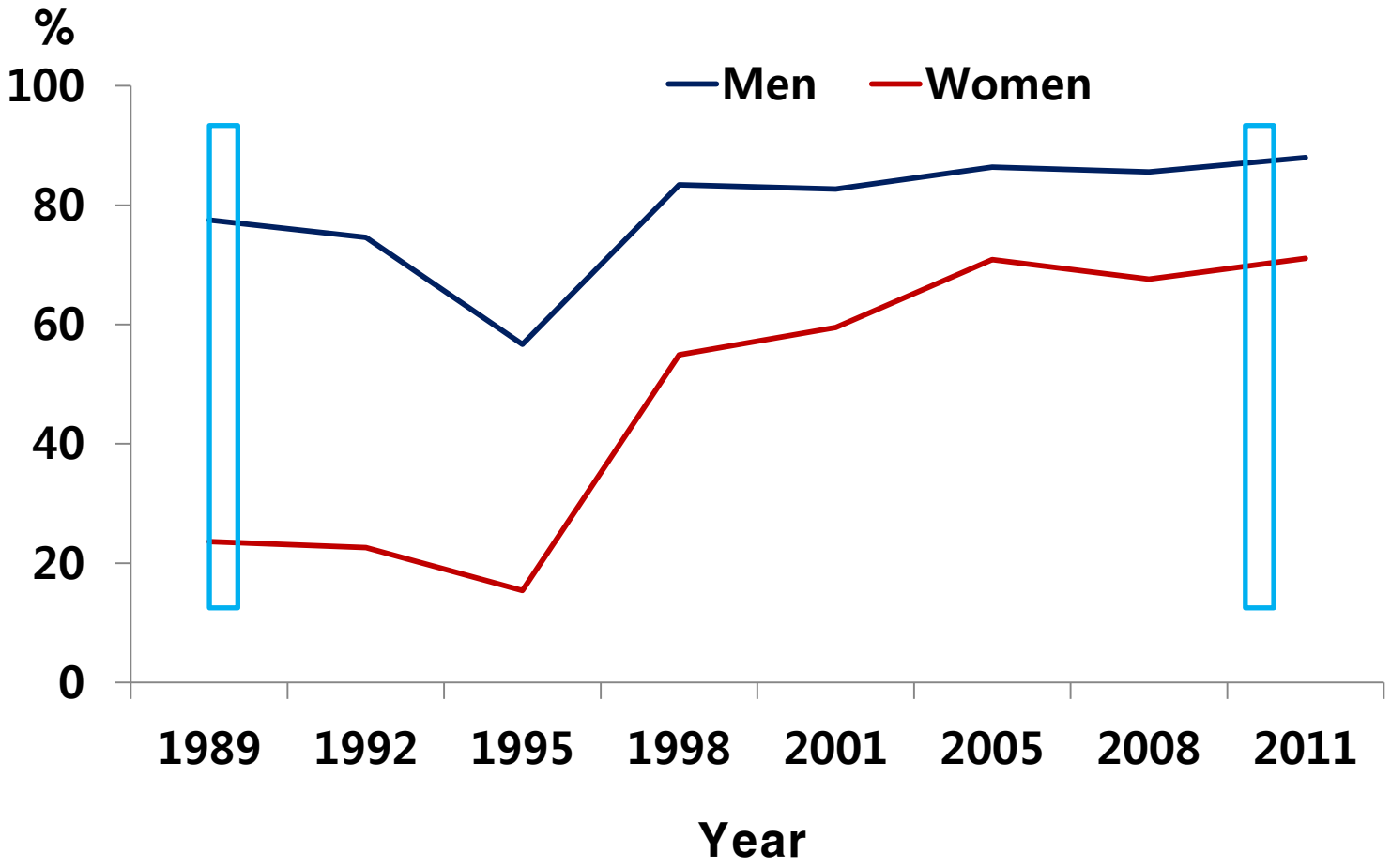
Cohort study design



Relative Risk

$$\text{Relative Risk} = \frac{\text{Incidence among Alcohol Drinker}}{\text{Incidence in Non-alcohol Drinker}}$$

Drinking Trends of Korean, 1989-2011



1) 1989~1995: Current drinking, aged 20-59 years
2) 1998~2001: Current drinking , aged 20 and older
3) 2005~2011: Current drinking , aged 19 and older

Source: Korea National Health & Nutrition Examination Survey

국민건강영양조사
Korea National Health & Nutrition Examination Survey

Cigarette Smoking, Alcohol Drinking, Hepatitis B, and Risk for Hepatocellular Carcinoma in Korea

Sun Ha Jee, Heechoul Ohrr, Jae Woong Sull, Jonathan M. Samet

Background: **Liver cancer is one of the most common cancers worldwide, particularly in Asia and Africa, where infectious hepatitis and aflatoxin exposures are common. We conducted a prospective cohort study of liver cancer in Korea to assess the independent effects and interactions of smoking, alcohol consumption, and hepatitis B on risk of mortality from hepatocellular carcinoma.** ***Methods:*** **From a total of 1 283 112 men and women free of cancer at baseline, 3807 died from liver cancer during follow-up from 1993 to 2002. All participants reported their smoking and alcohol consumption, and hepatitis B surface antigen (HBsAg) status was documented for 47.2% of the participants. Relative risk and 95% confidence intervals (CIs) of mortality from hepatocellular carcinoma were calculated using proportional**

provided findings on synergi
and other factors carried out
be inconclusive *(1)*.

We have conducted a pro
of cancer in a cohort of Kore
Study) insured by the Nati
(2). The cohort is large, r
information on smoking an
participants, and informatio
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except for emigrants. In this
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HBsAg during 10 years of
3807 deaths from hepatocel

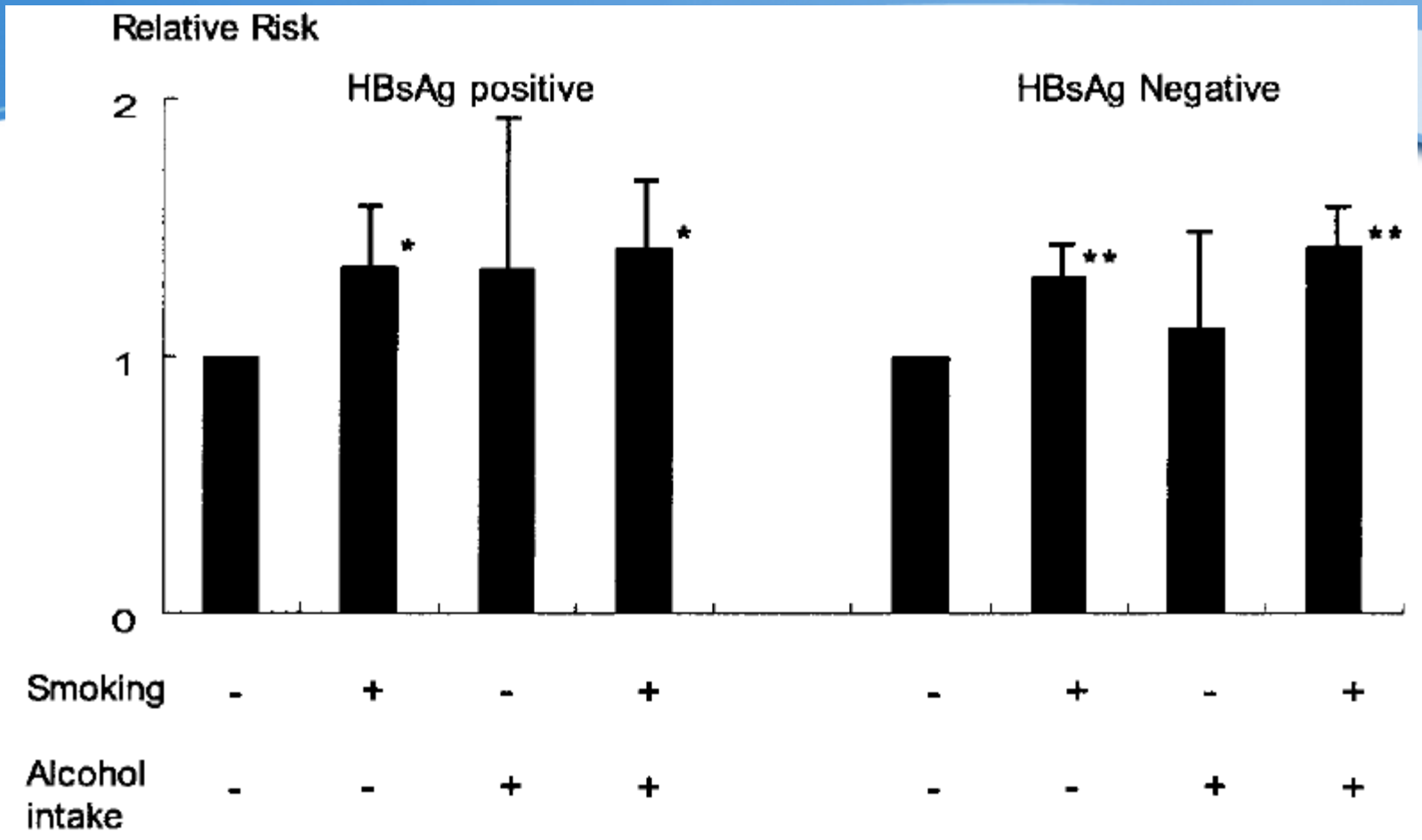
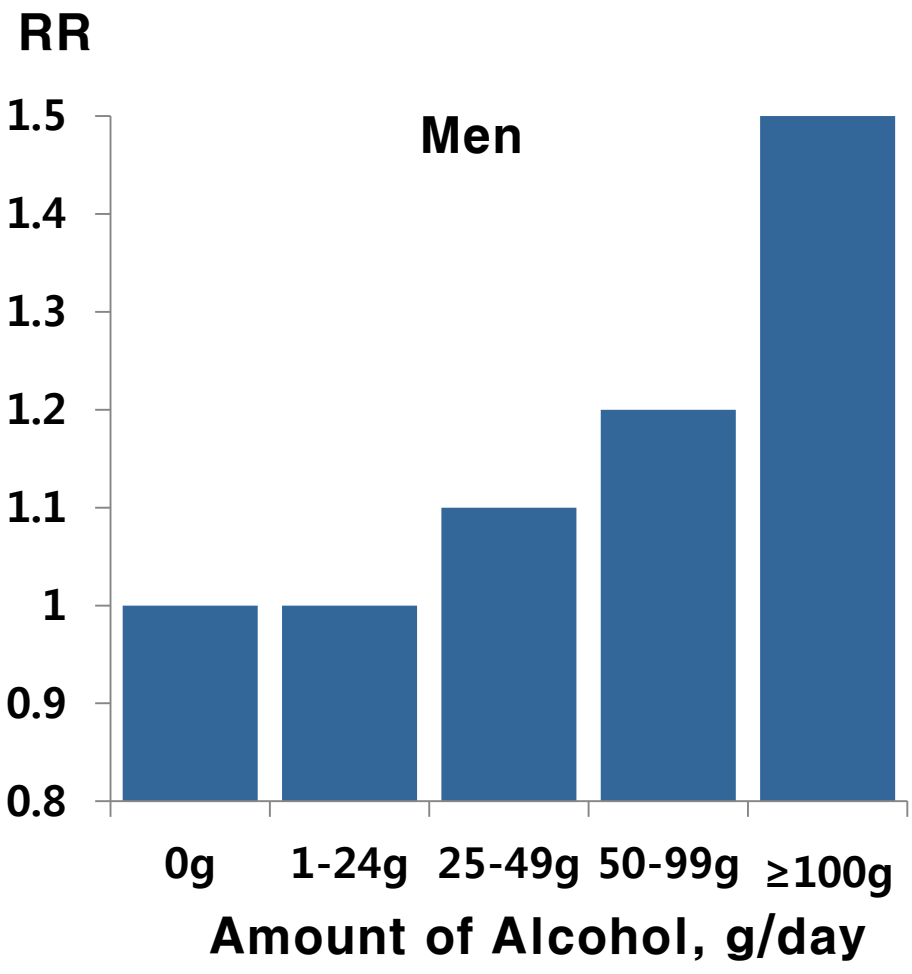
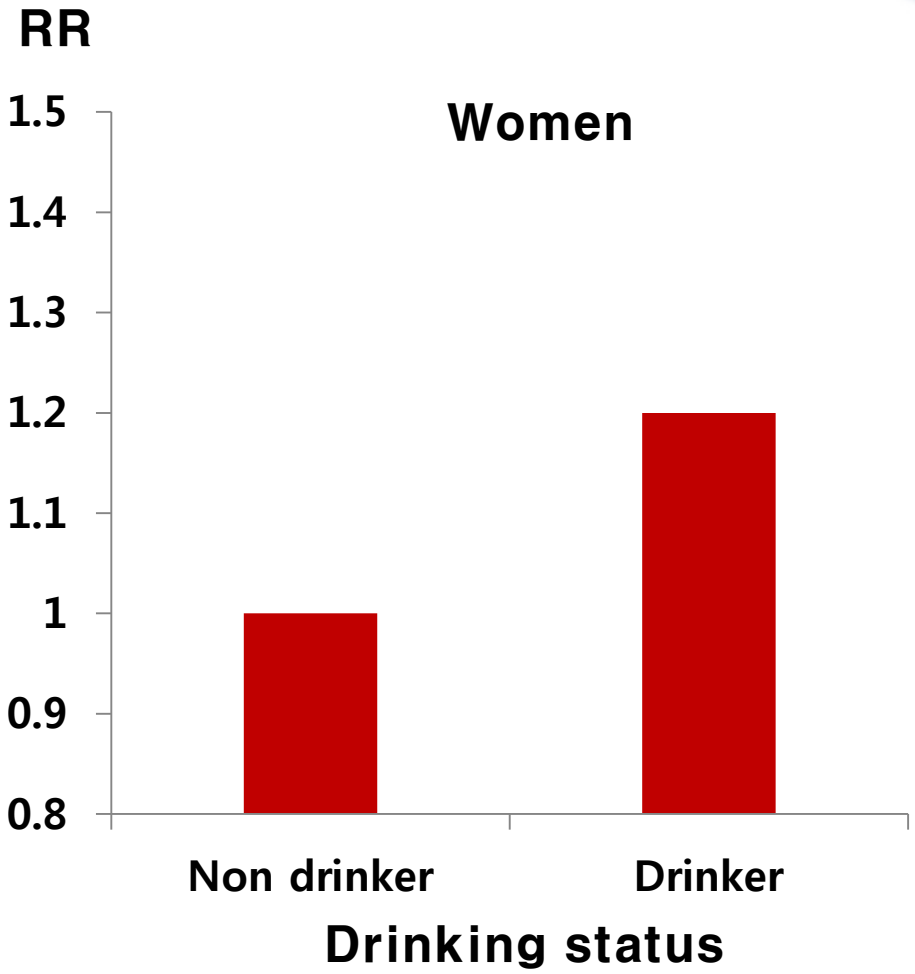


Fig. 1. Relative risk for liver cancer death by smoking and alcohol intake stratified by hepatitis B surface antigen (HBsAg) status. Smoking is classified as "–" for never smoker and "+" for smoker; alcohol intake as "–" for non-drinker

Jee SH et al., JNCI, 2004

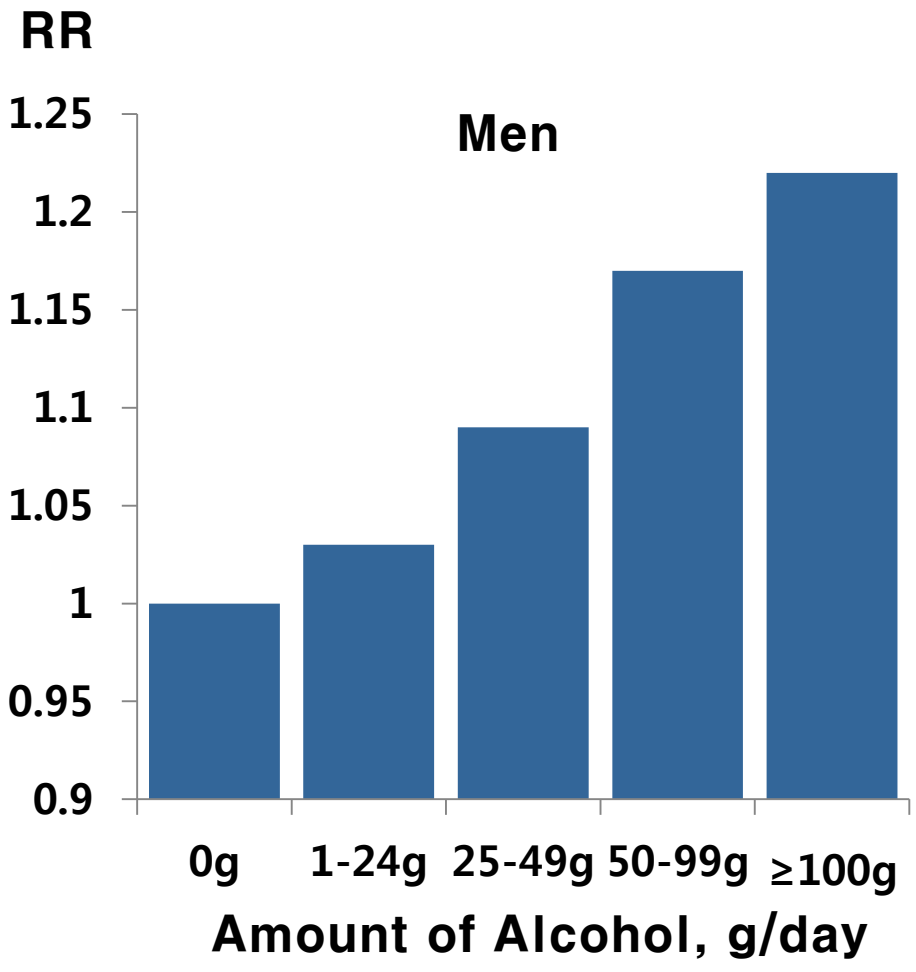
RR of liver cancer by amount of alcohol and drinking status in Korea

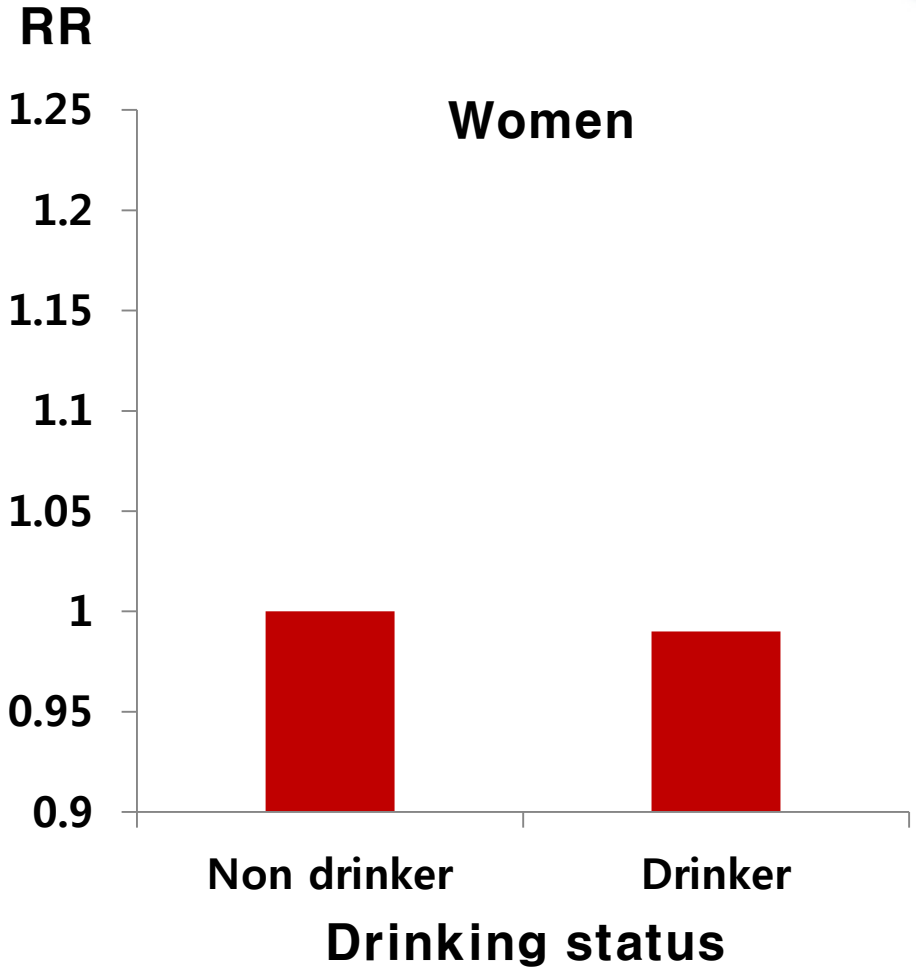




*Adjusted for age, age^2, body mass index, GOT, HBsAg and smoking.

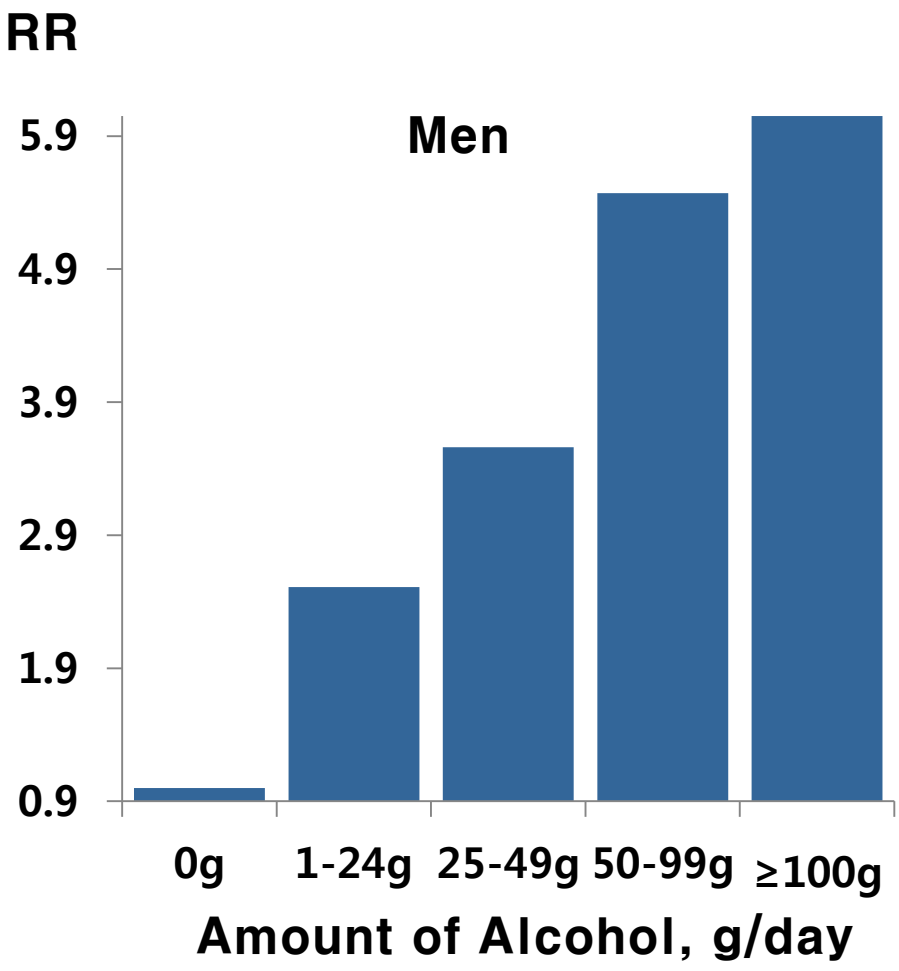
RR of all cancer by amount of alcohol and drinking status in Korea

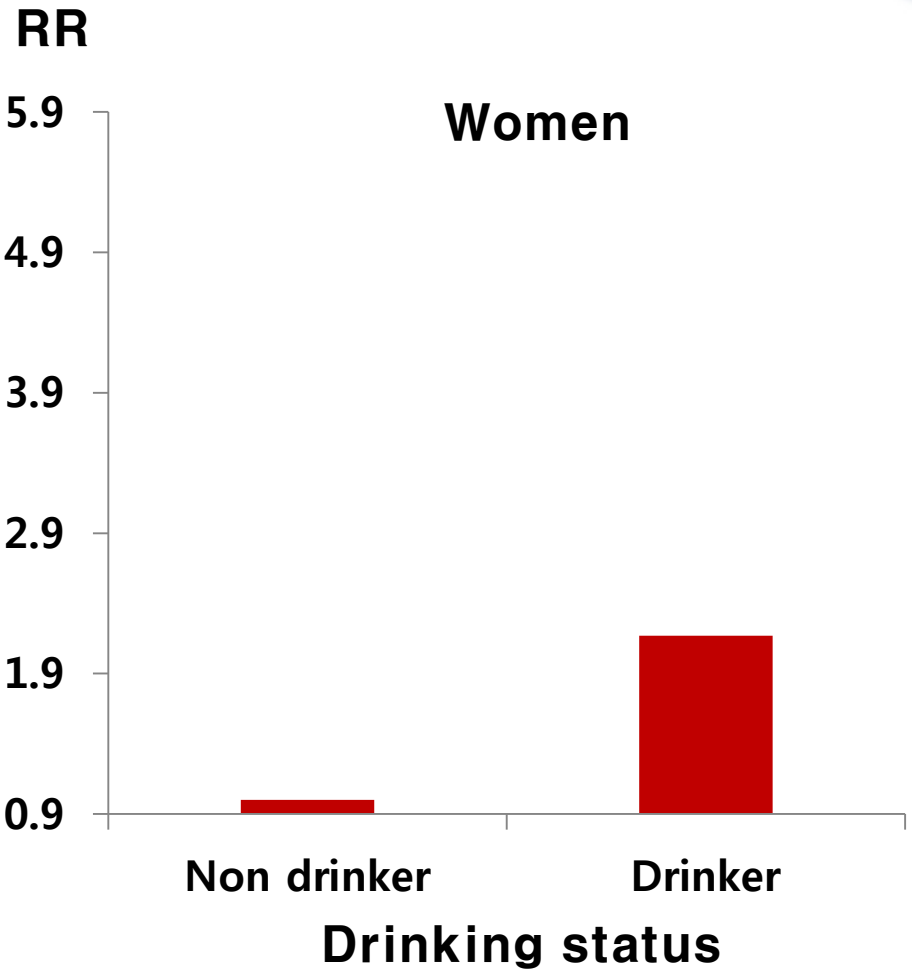




*Adjusted for age, age square, body mass index and smoking status

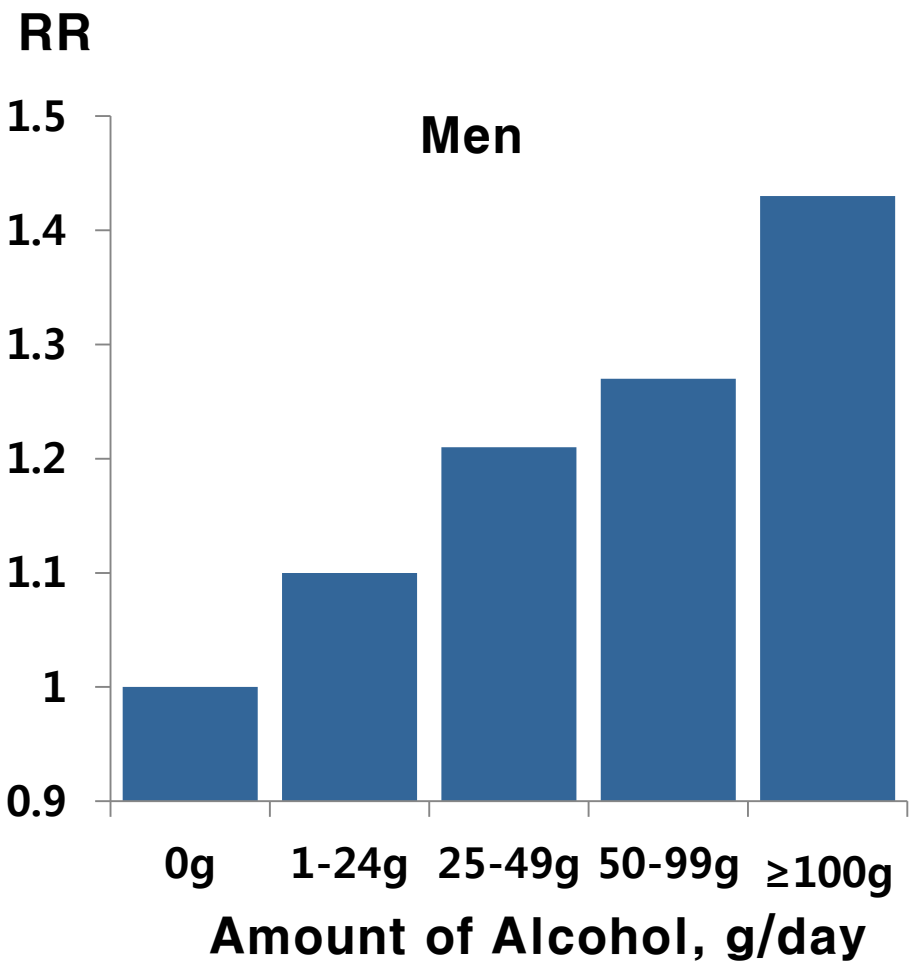
RR of esophageal cancer by amount of alcohol and drinking status in Korea

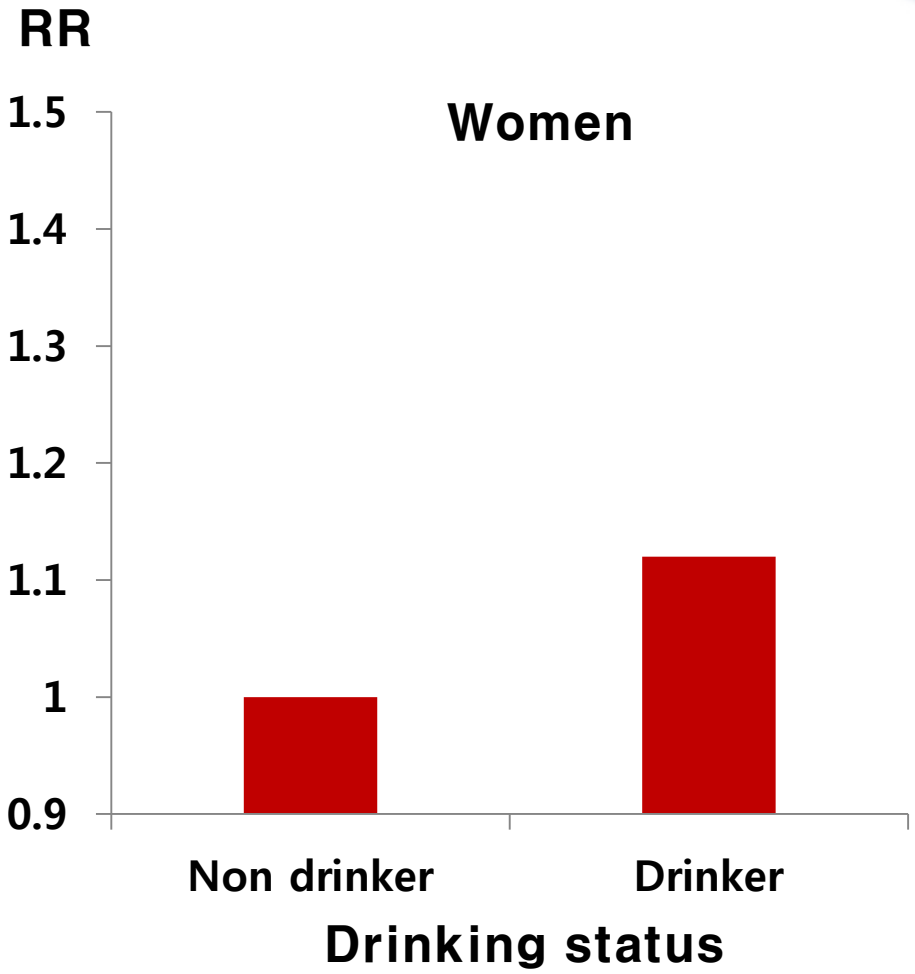




*Adjusted for age, age square, body mass index and smoking status

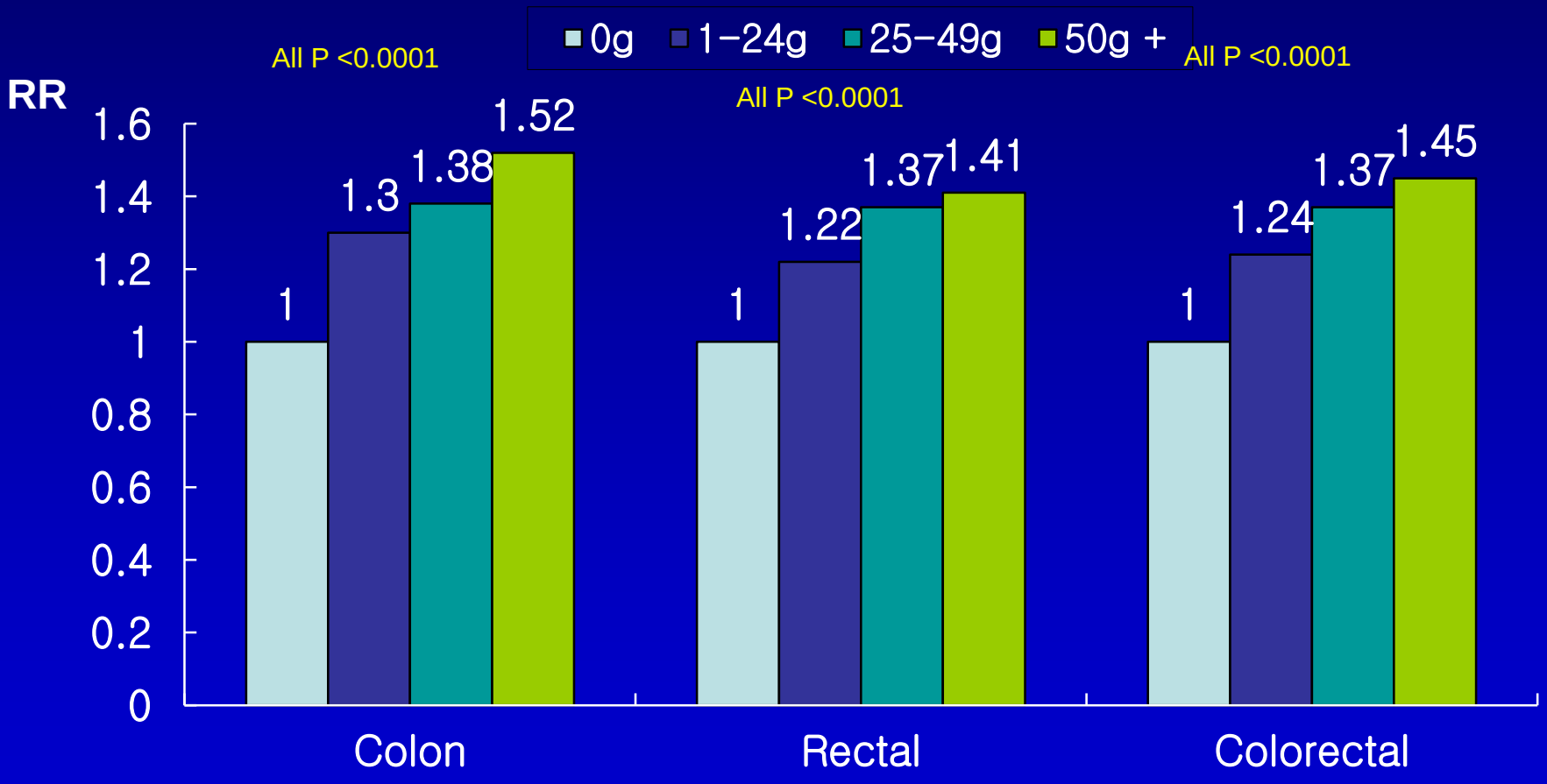
RR of gastric cancer by amount of alcohol and drinking status in Korea





*Adjusted for age, age square, body mass index and smoking status

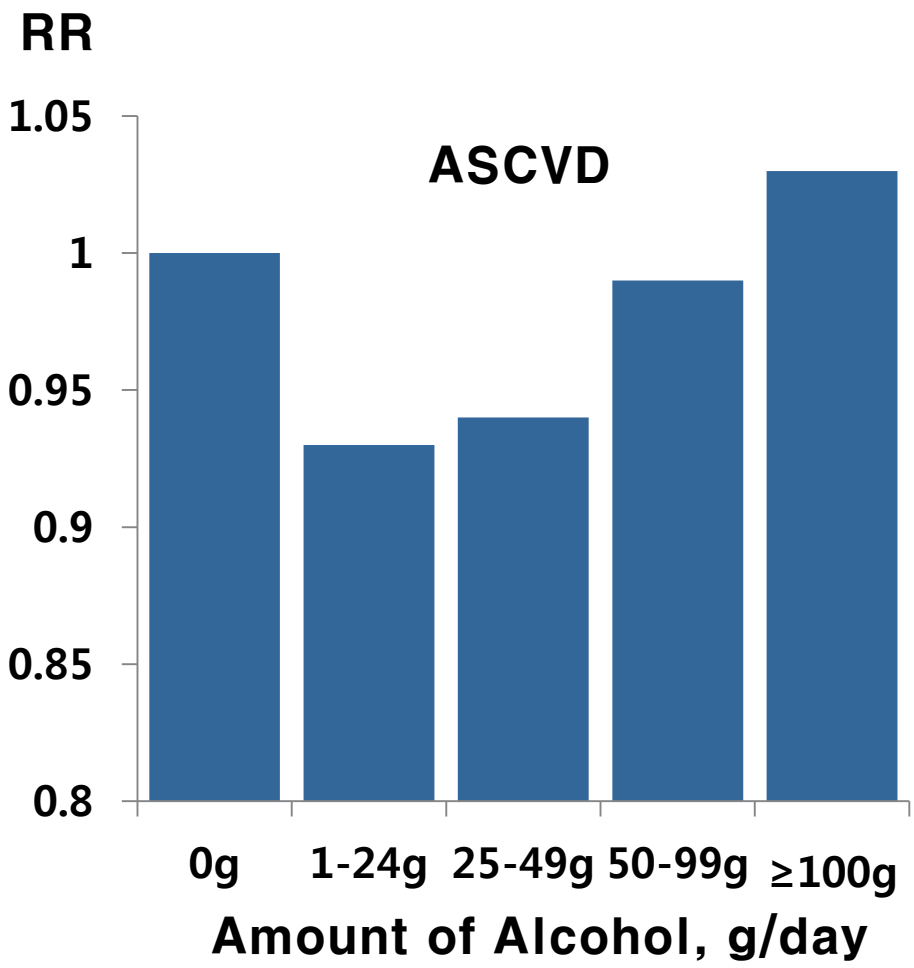
RRs for Alcohol Drinking on CRC in Korean Men, 1992-2011

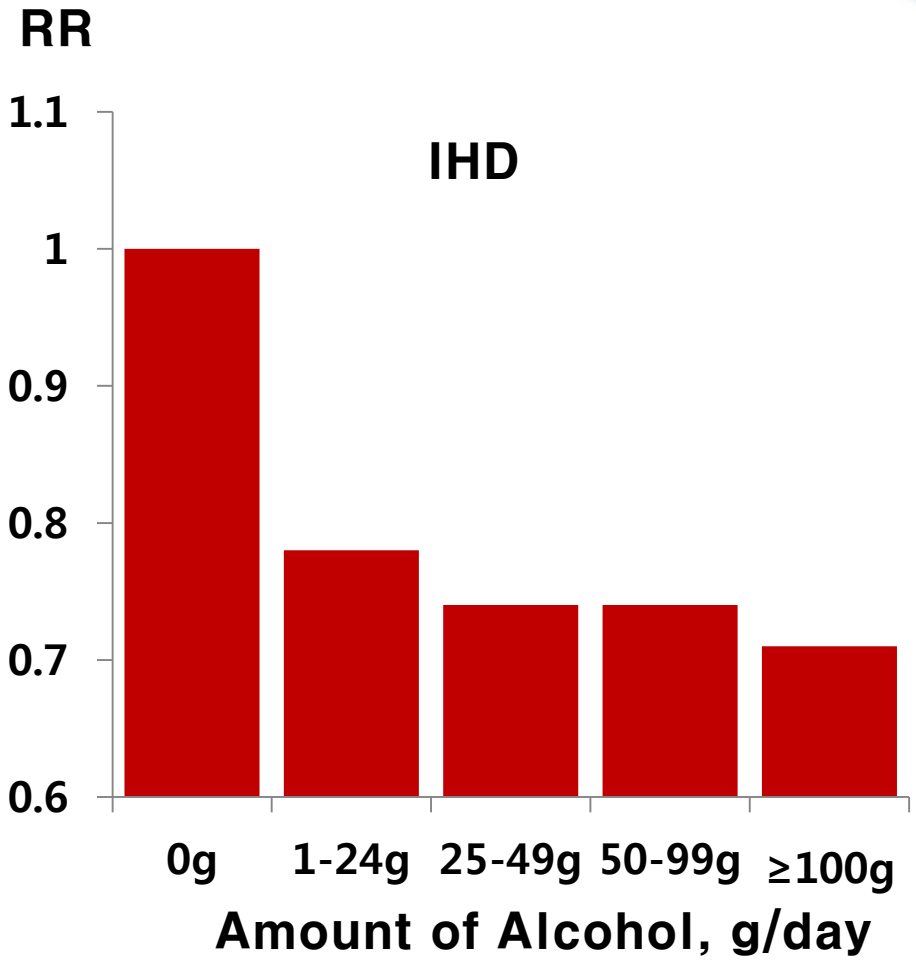


Adjusted for age, smoking, and BMI

Source: KCPS, 2013

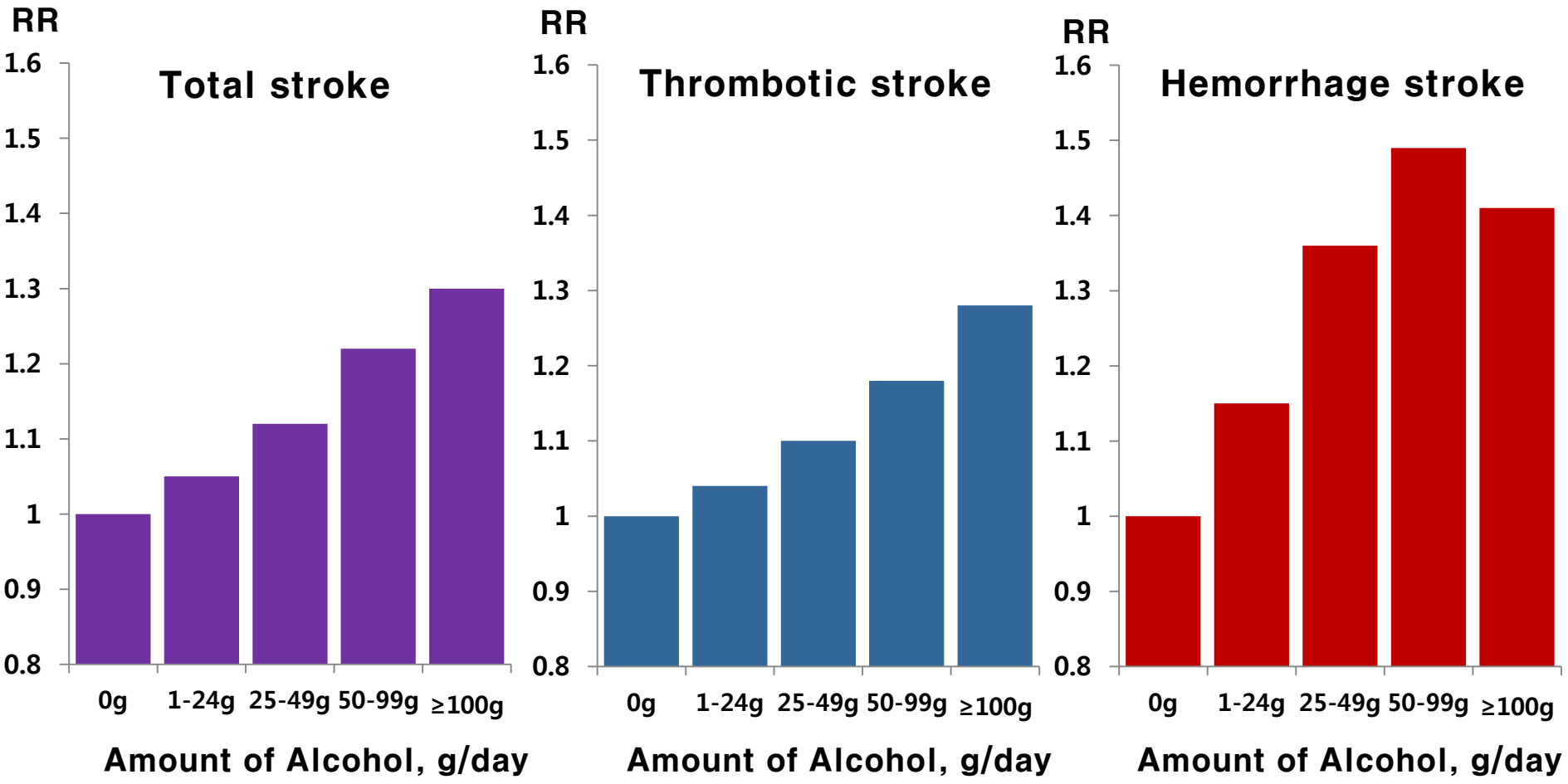
RR of CVD by amount of alcohol in Korean men





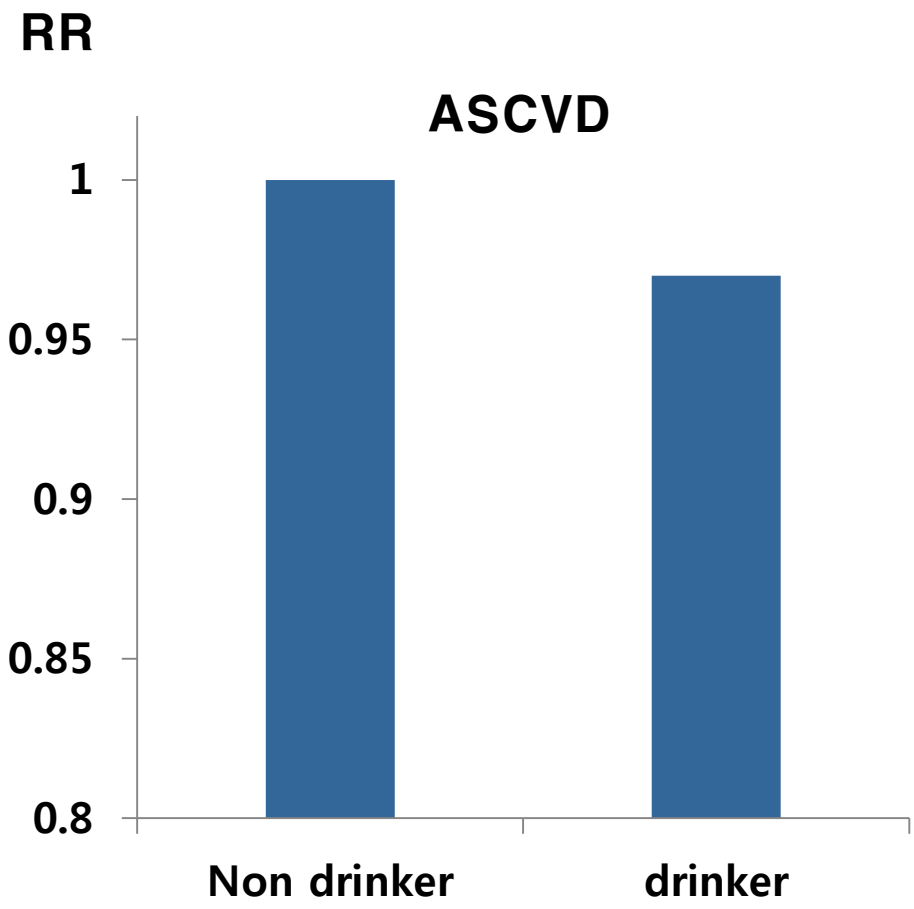
*Adjusted for age, age square, body mass index and smoking status

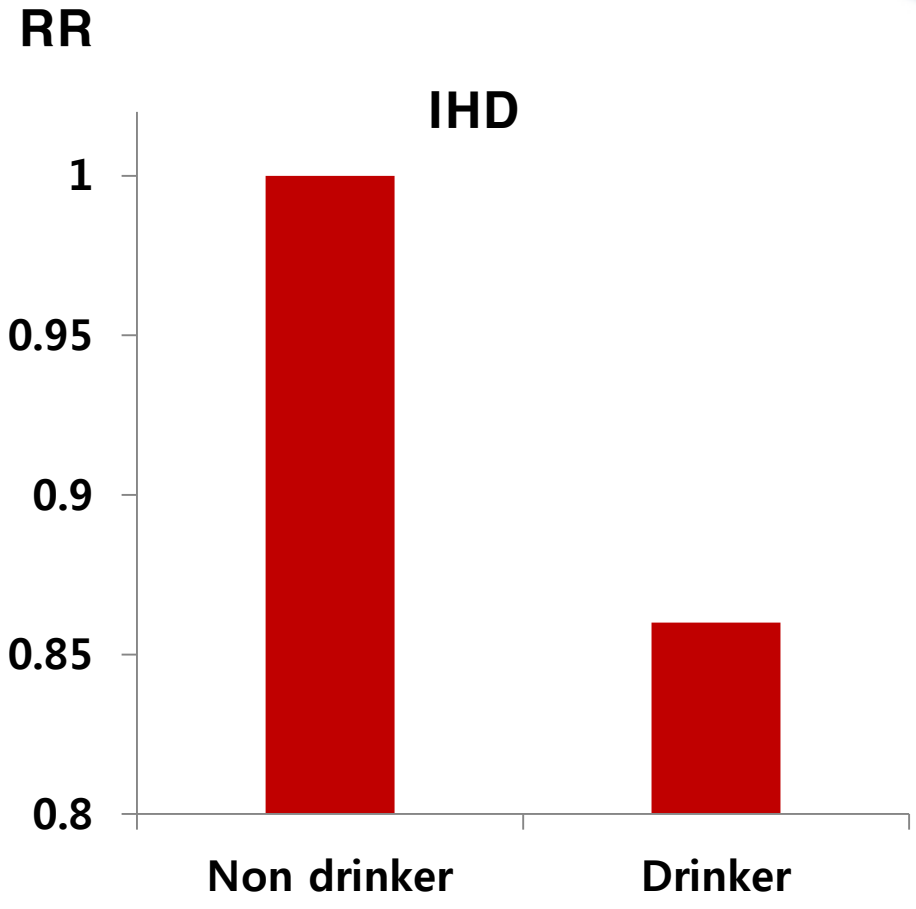
RR of stroke by amount of alcohol in Korean men



*Adjusted for age, age square, body mass index and smoking status

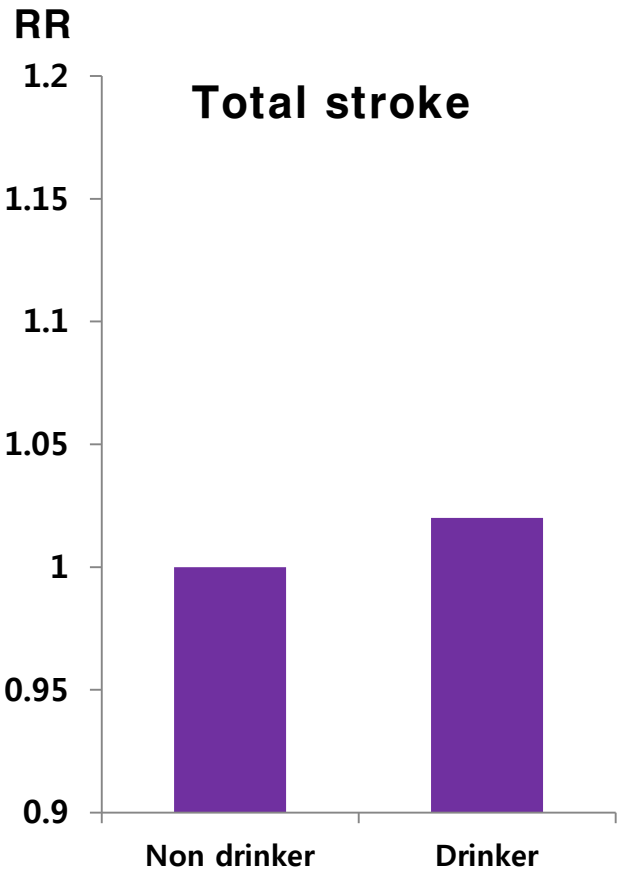
RR of CVD by drinking status in Korean women

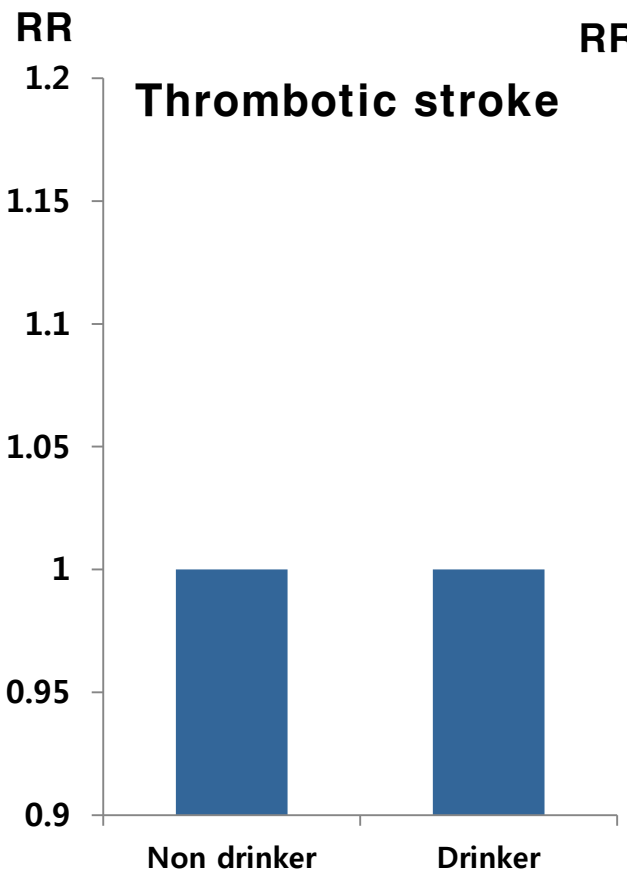


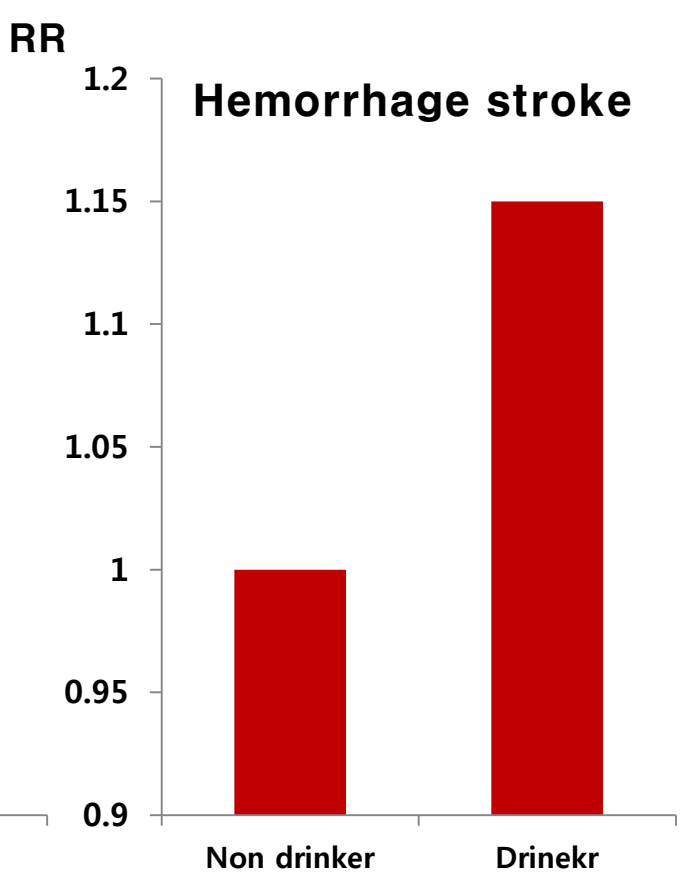


*Adjusted for age, age square, body mass index and smoking status

RR of stroke by drinking status in Korean women

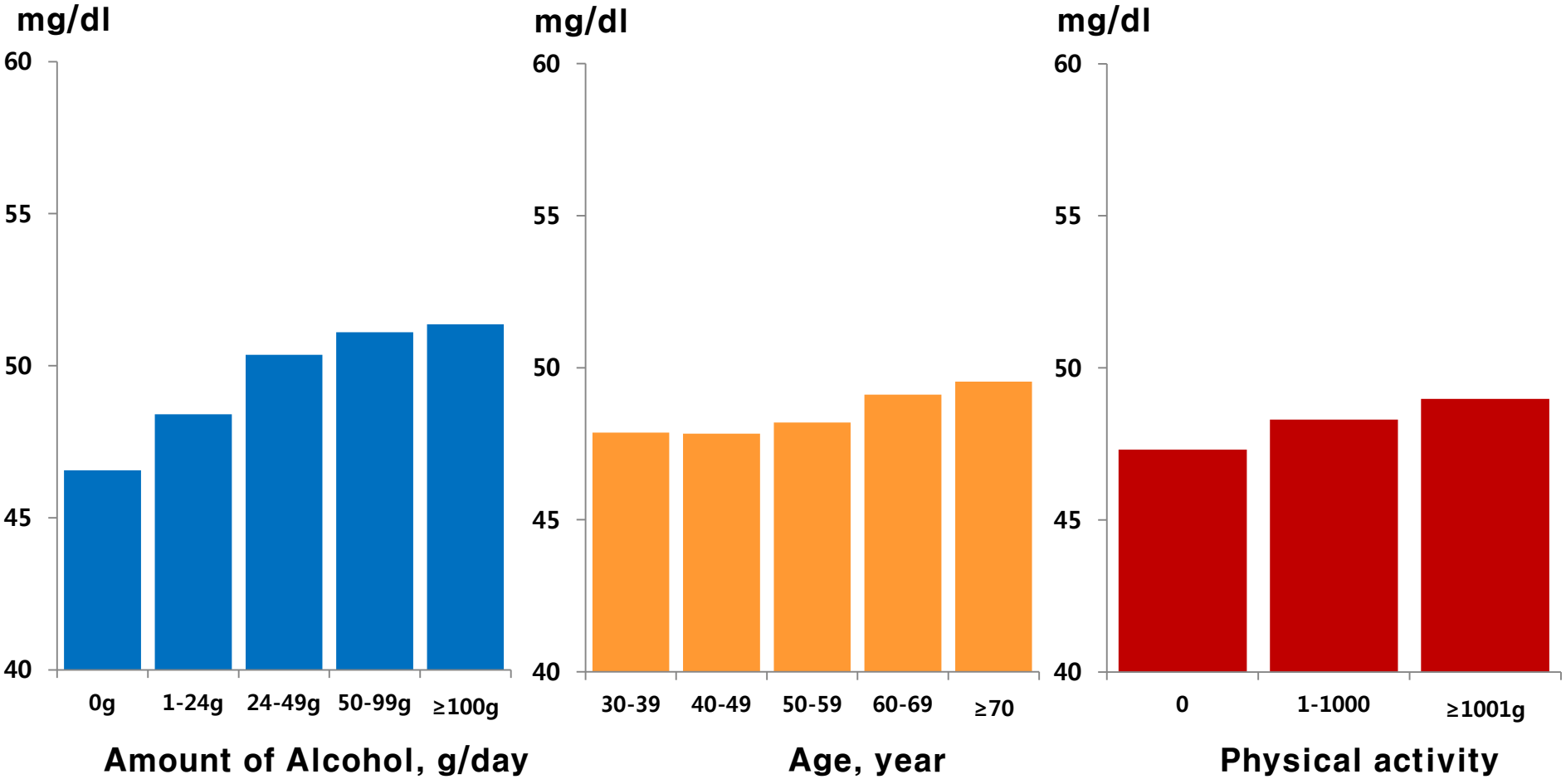




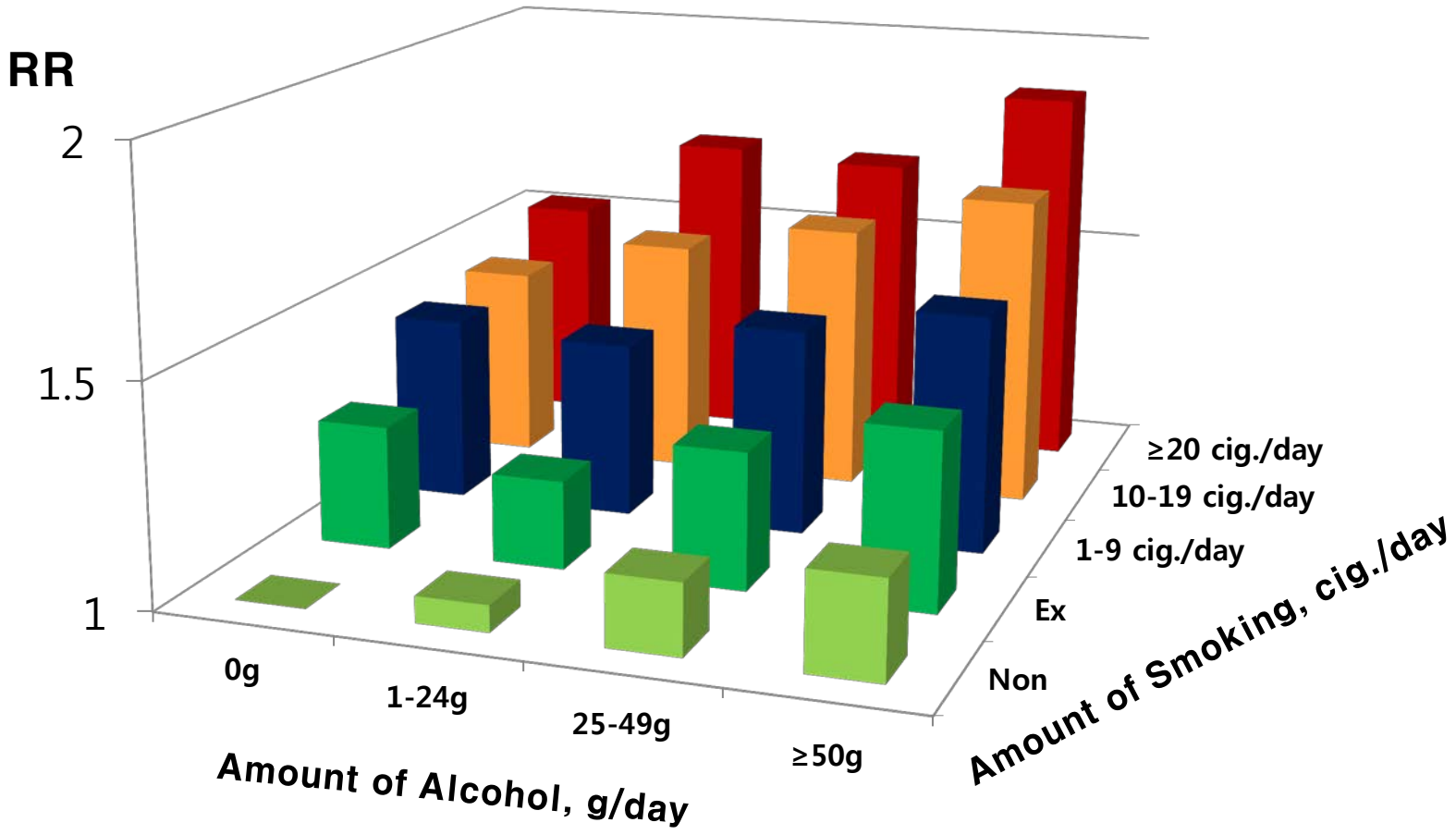


*Adjusted for age, age square, body mass index and smoking status

The effect of alcohol, age, exercise on HDL-C in Korean Men

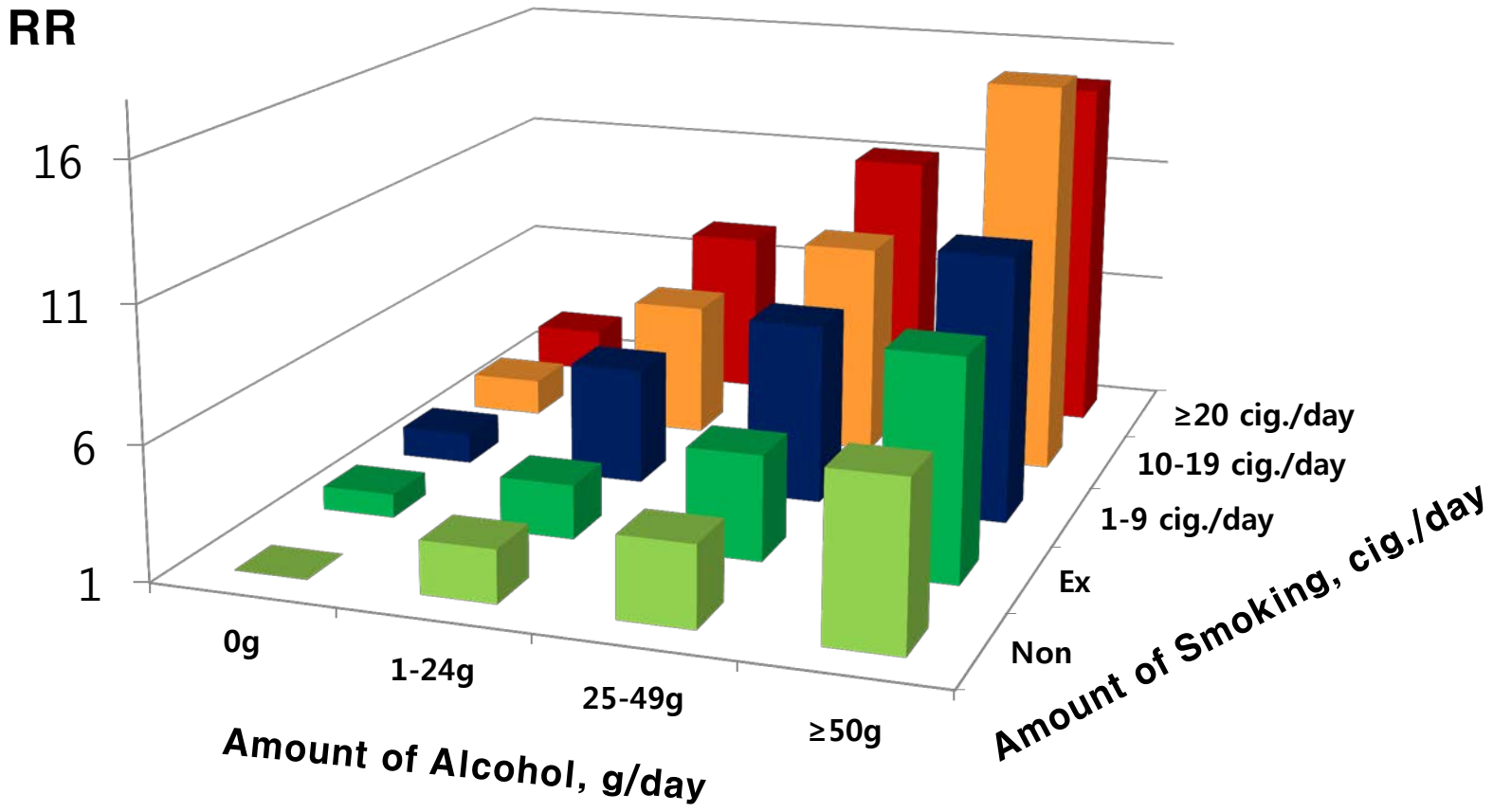


Combined effect of alcohol (4 groups) and smoking on all cancer in Korean men



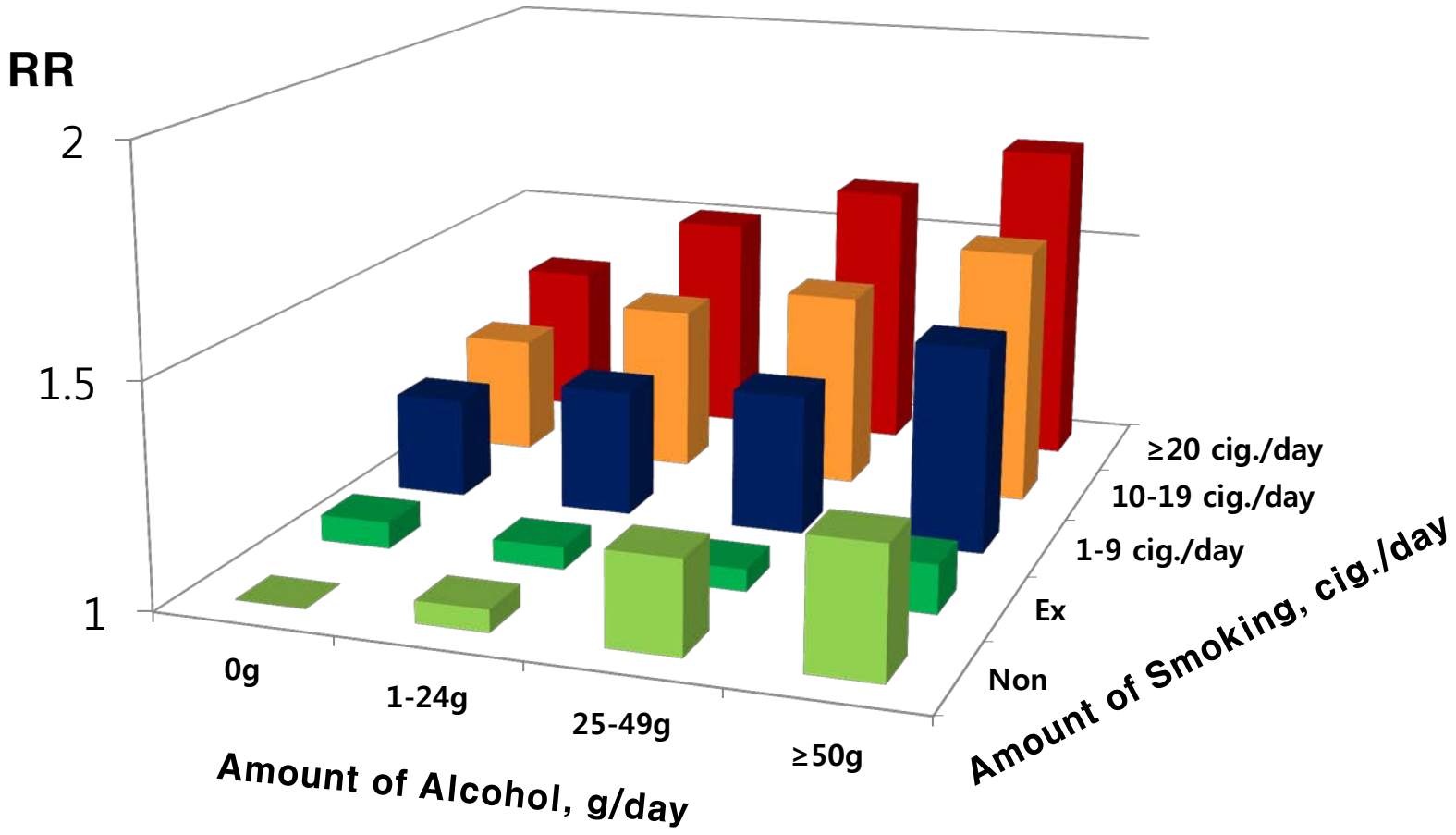
*Adjusted for age, age square, body mass index

Combined effect of alcohol (4 groups) and smoking on esophageal cancer in Korean men



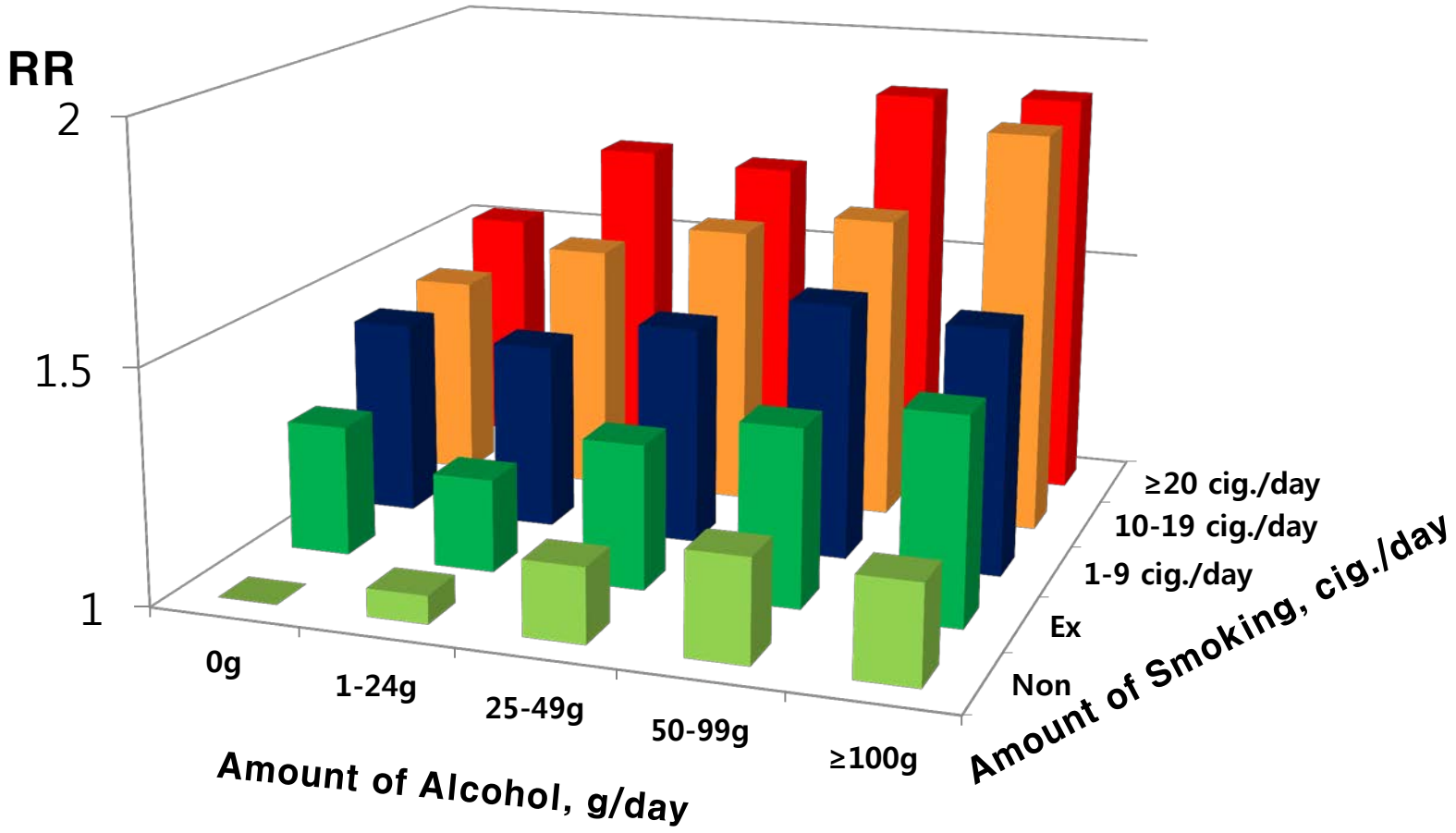
*Adjusted for age, age square, body mass index

Combined effect of alcohol (4 groups) and smoking on stroke in Korean men



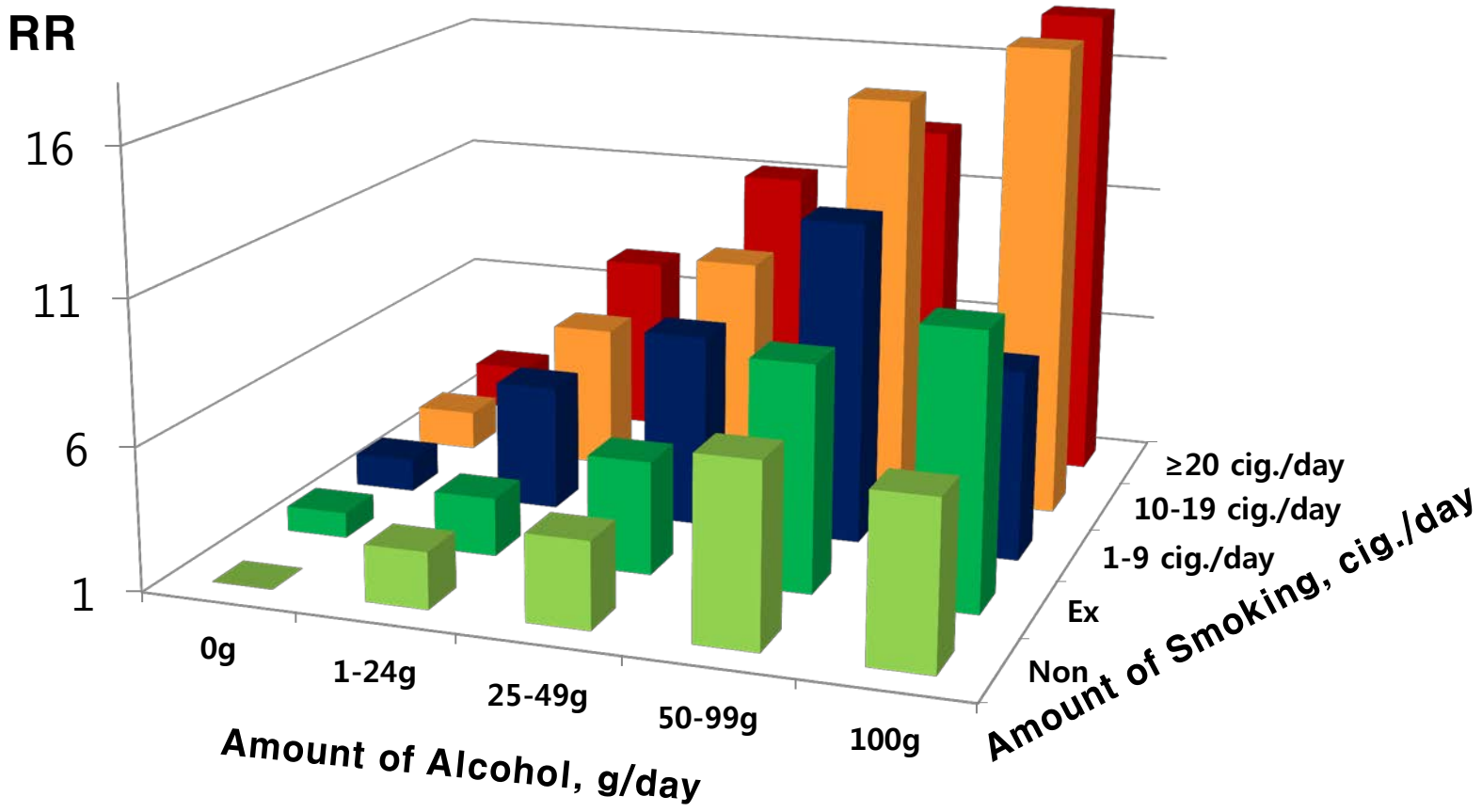
*Adjusted for age, age square, body mass index

Combined effect of alcohol (5 groups) and smoking on all cancer in Korean men



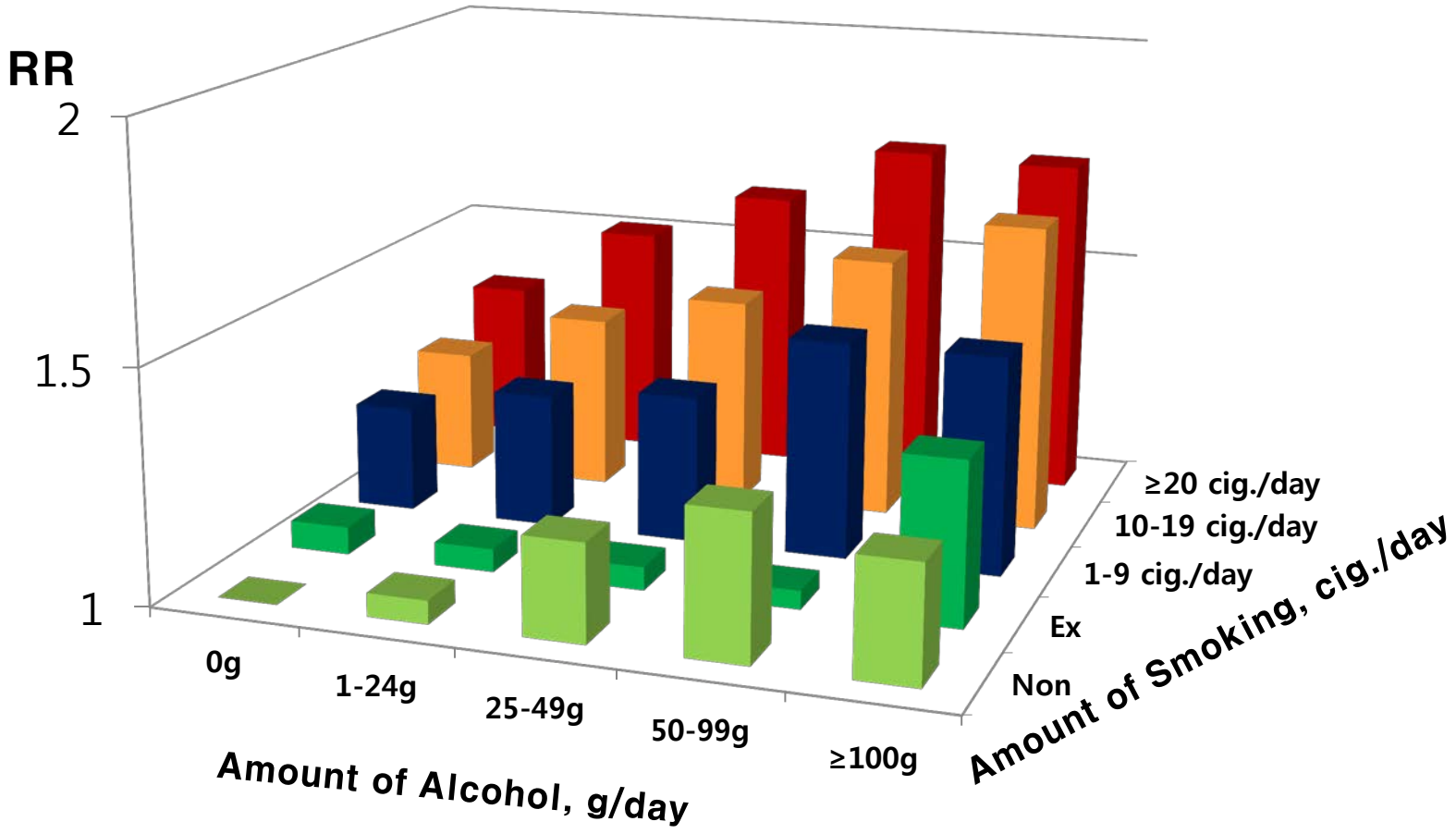
*Adjusted for age, age square, body mass index

Combined effect of alcohol (5 groups) and smoking on esophageal cancer in Korean men



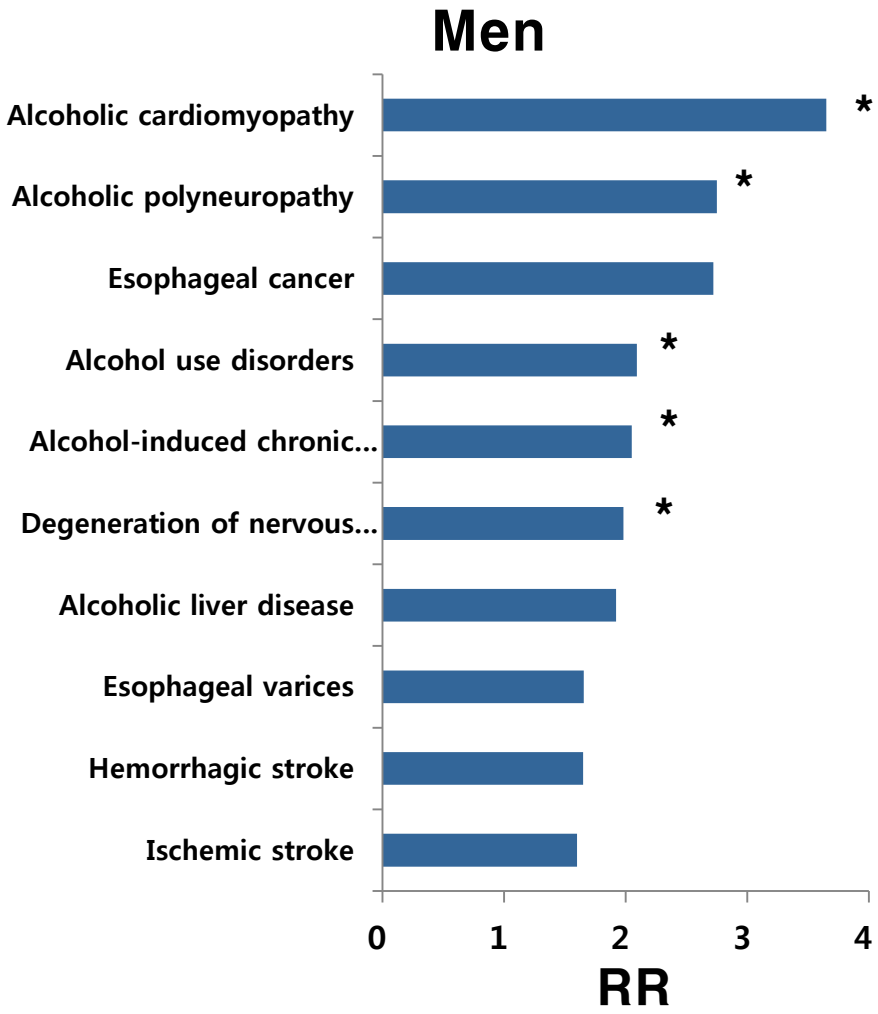
*Adjusted for age, age square, body mass index

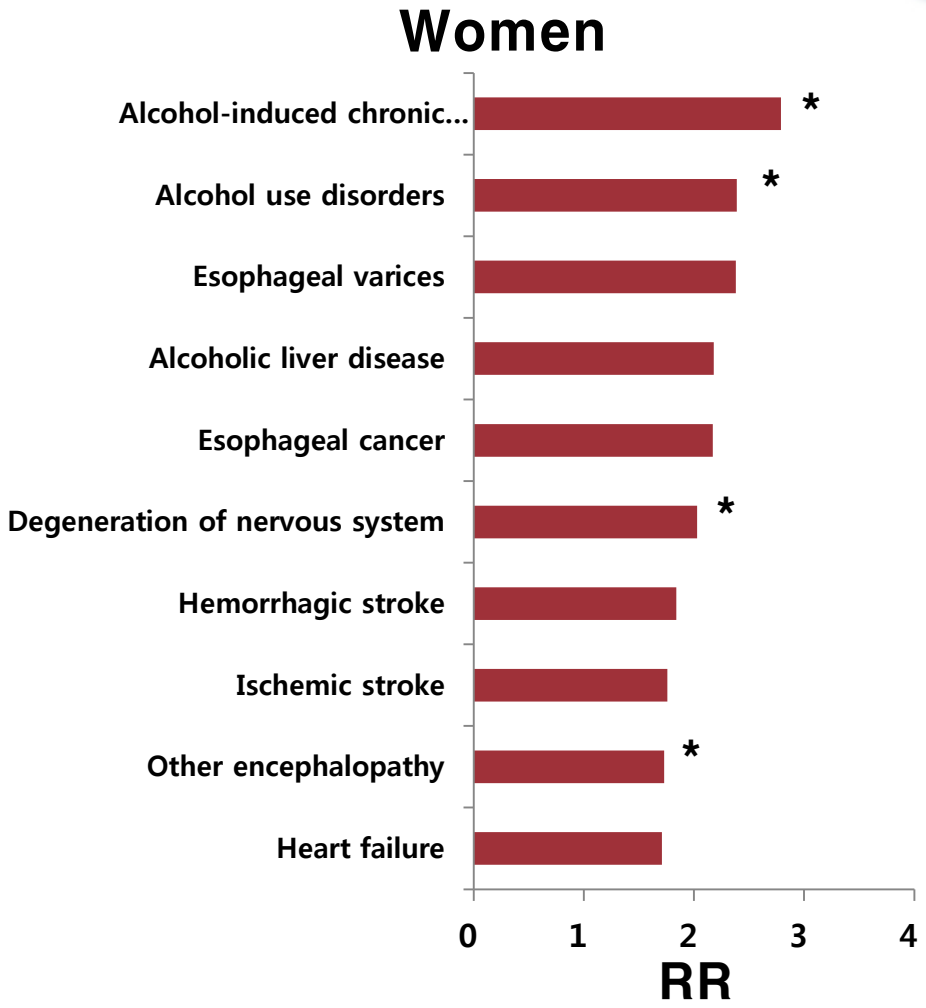
Combined effect of alcohol (5 groups) and smoking on stroke in Korean men



*Adjusted for age, age square, body mass index

RR of various diseases by drinking status in Korean men and women





* Source: Lee et al., NHIS report, 2012

Contents

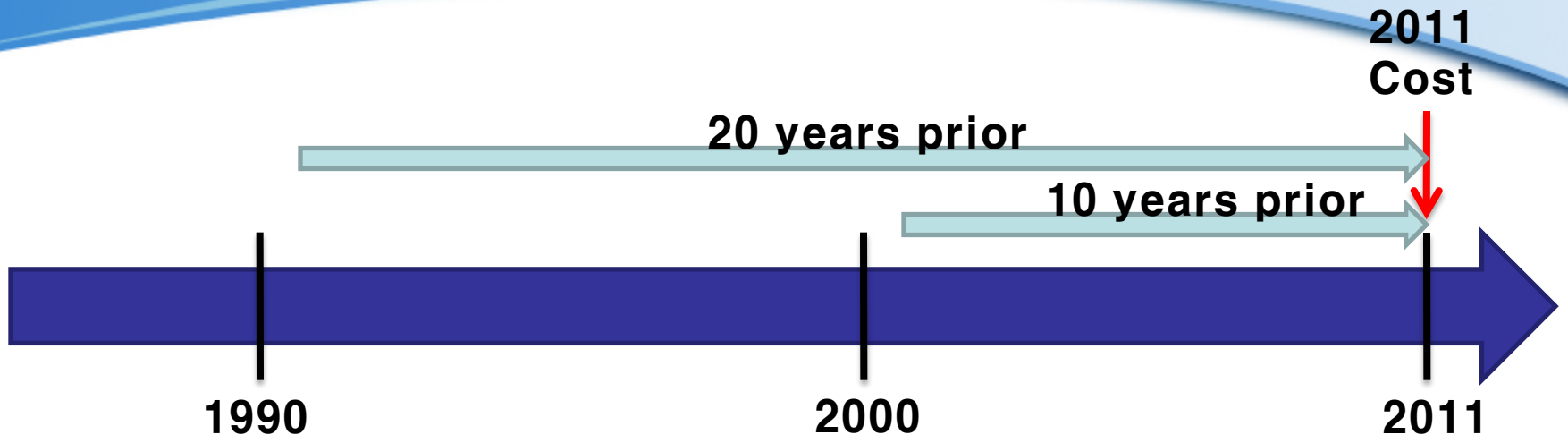
- Collaborative study with NHIS
- Health effect of alcohol drinking
- Attributable medical cost of alcohol drinking

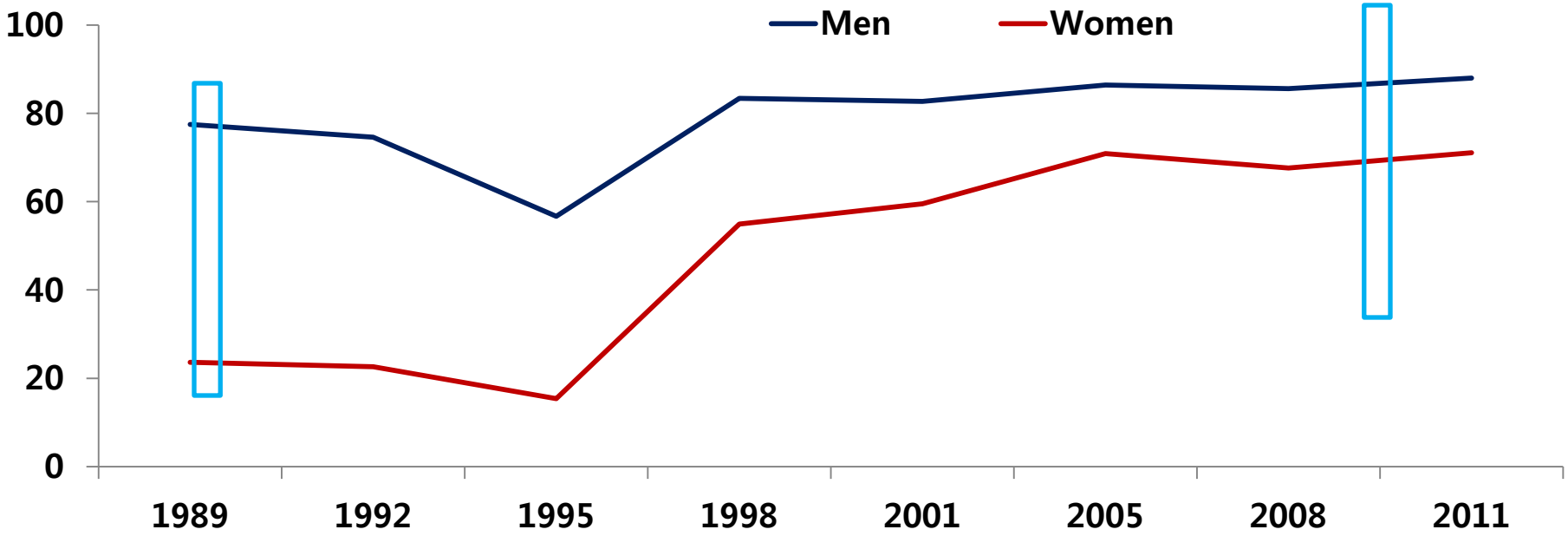
Population Attributable Risk (PAR)

$$PAR = p(r-1) / (p(r-1) +1)$$

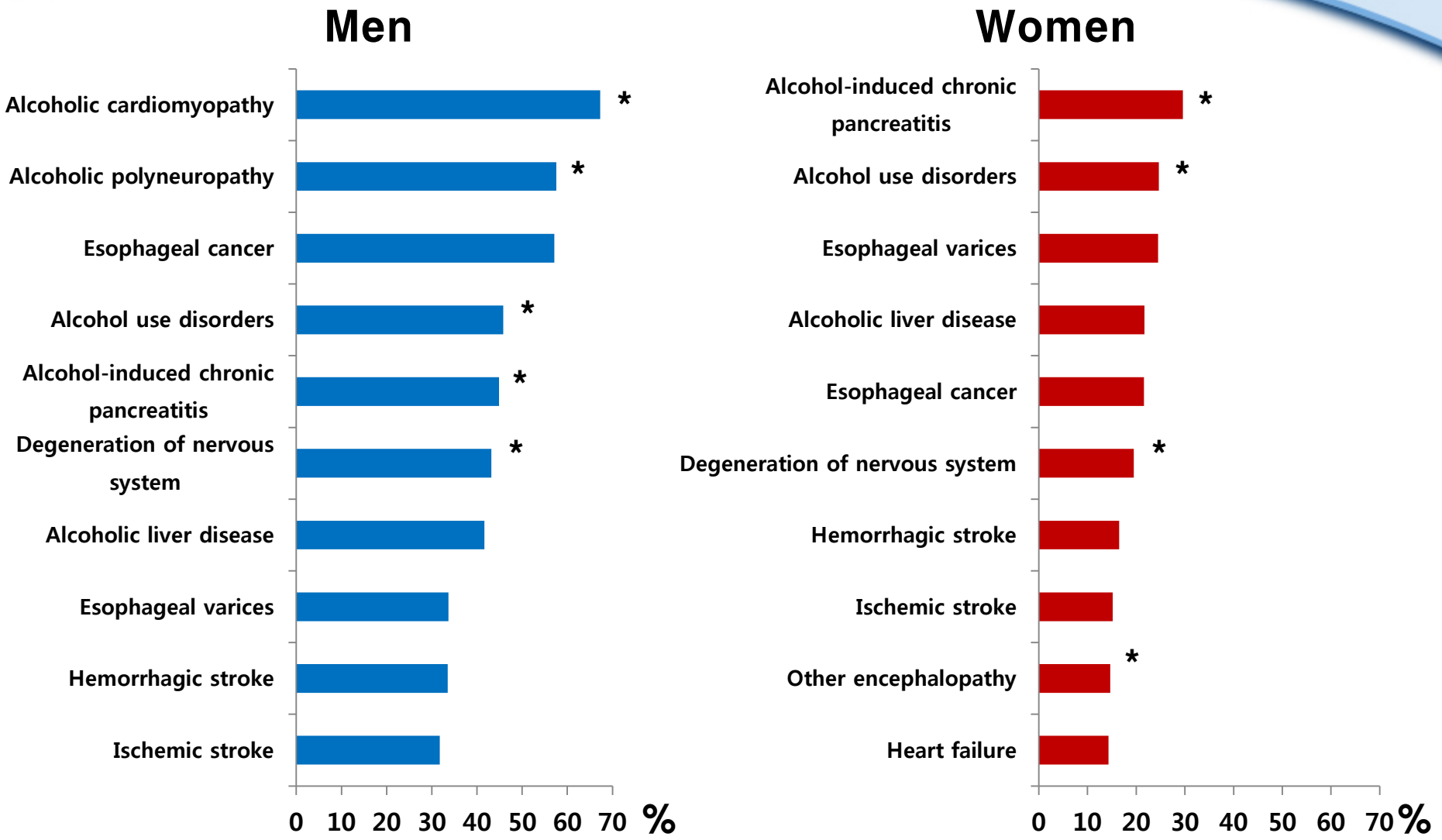
Levin's equation

Do we need a latency period ?





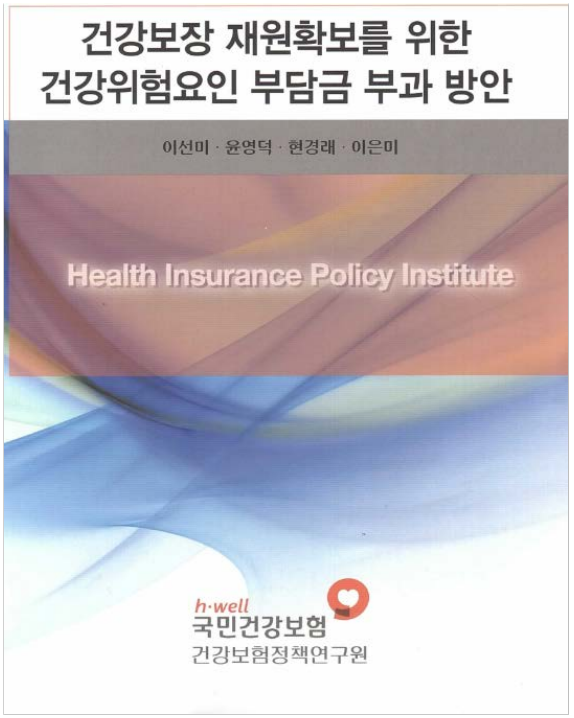
PAR of various diseases by alcohol drinking in Korean men and women



* Source: Lee at al., NHIS report, 2012

Attributable medical cost of alcohol drinking

- Disease specific approach
  - 29 alcohol-related diseases
  - Lee SM et al., NHIS report, October, 2012
- RRs of 29 alcohol-related diseases
  - Korean Cancer Prevention Study
  - Lee SM et al.'s report
- PAR



2012 NHIS report

Alcohol drinking related diseases

	Disease	ICD-10 code	References
1	Mouth and oropharyngeal cancer	C00-C14	1,2,3,4,5
2	Esophageal cancer	C15	1,2,3,4,5
3	Colorectal cancer	C18-C21	5
4	Liver cancer	C22	1,2,3,4,5
5	Laryngeal cancer	C32	1,3,4
6	Breast cancer	C50	2,3,4,5
7	Other neoplasm	D00-D48	4,5
8	Diabetes	E10-E14	4,5
9	Alcohol use disorders	F10	1,2,3,4,5
10	Unipolar depressive disorder	F32-F33	4,5
11	Degeneration of nervous system due to alcohol	G31.2	4
12	Alcoholic polyneuropathy	G62.1	1,2,3,4
13	Hypertension	I10-I15	1,2,3,4,5
14	Ischemic heart disease	I20-I25	2,4,5
15	Alcoholic cardiomyopathy	I42.6	1,2,3,4
16	Cardiac arrhythmia	I47-I49	2,3,4
17	Heart failure	I50, I51	3
18	Hemorrhagic stroke	I60-I62	1,2,3,4,5
19	Ischemic stroke	I63-I66	1,2,3,4,5
20	Other encephalopathy	I67-I69	1,2,3,4
21	Esophageal varices	I85	2,3,4
22	Gastro-oesophageal haemorrhage syndrome	K22.6	1,2,3
23	Alcoholic gastritis	K29.2	1,2,3,4
24	Alcoholic liver disease	K70	1,2,3,4
25	Liver cirrhosis	K74	1,2,3,4,5
26	Cholelithiasis	K80	2,4
27	Acute/chronic pancreatitis	K85, K86.1	1,2,3,4
28	Alcohol-induced chronic pancreatitis	K86.0	4
29	Alcohol poisoning	X45,Y15,T51	1,2,3,4,5

References: 1. Schulz et al. (1991), 2 English et al. (1995), 3. Single et al. (1998), Rehm et al. (2006), 5. Rehm et al. (2007).

Alcohol drinking related diseases: RR and PAR by alcohol drinking

		Men		Women	
	Disease	RR	PAR	RR	PAR
1	Mouth and oropharyngeal cancer	1.35	21.3	1.12	2.7
2	Esophageal cancer	2.72	57.1	2.17	21.6
3	Colorectal cancer	1.25	16.2	1.11	2.5
4	Liver cancer	1.11	7.9	1.08	1.8
5	Laryngeal cancer	1.49	27.5		
6	Breast cancer			1.08	1.8
7	Other neoplasm	1.05	3.7		
8	Diabetes	1.30	18.9	1.38	8.2
9	Alcohol use disorders	2.09	45.8	2.39	24.6
10	Unipolar depressive disorder	1.06	4.4	1.25	5.5
11	Degeneration of nervous system	1.98	43.2	2.03	19.5
12	Alcoholic polyneuropathy	2.75	57.6		
13	Hypertension	1.43	25.0	1.55	11.4
14	Ischemic heart disease	1.24	15.7	1.50	10.5
15	Alcoholic cardiomyopathy	3.65	67.3		
16	Cardiac arrhythmia	1.16	11.0	1.20	4.5
17	Heart failure	1.40	23.7	1.71	14.3
18	Hemorrhagic stroke	1.65	33.5	1.84	16.5
19	Ischemic stroke	1.60	31.7	1.76	15.2
20	Other encephalopathy	1.47	26.7	1.73	14.6
21	Esophageal varices	1.66	33.7	2.38	24.5
22	Gastro-oesophageal haemorrhage	1.55	29.9		
23	Alcoholic gastritis	1.53	29.1	1.35	7.6
24	Alcoholic liver disease	1.92	41.6	2.18	21.7
25	Liver cirrhosis			1.36	7.8
26	Cholelithiasis	1.12	8.5	1.23	5.1
27	Acute/chronic pancreatitis	1.55	29.9	1.17	3.8
28	Alcohol-induced chronic pancreatitis	2.05	44.9	2.79	29.6
29	Alcohol poisoning	1.50	27.9	1.69	14.0

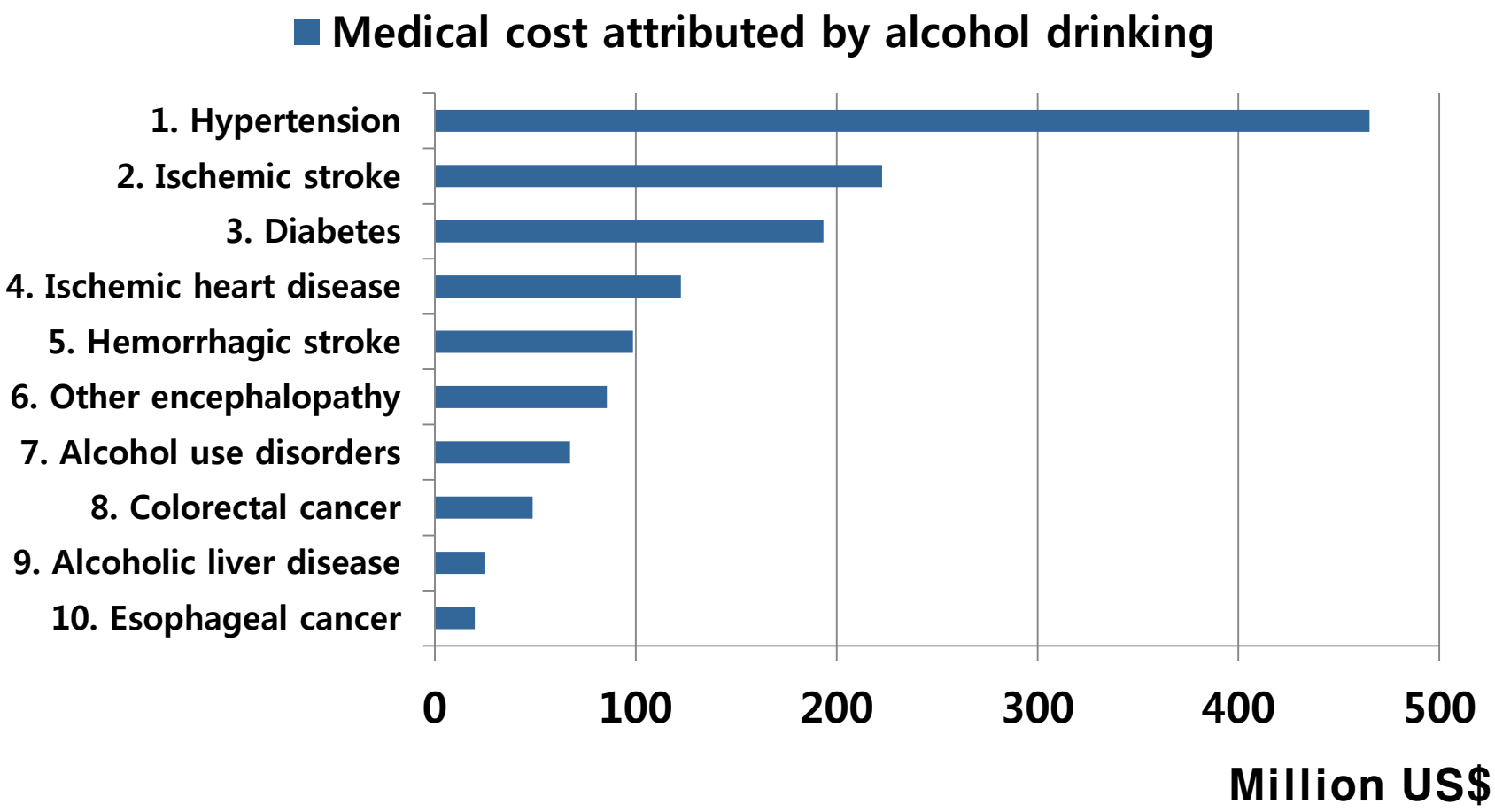
References: 1. Schulz et al. (1991), 2 English et al. (1995), 3. Single et al. (1998), Rehm et al. (2006), 5. Rehm et al. (2007).

Medical Care Cost by alcohol drinking in Korea, 2011, unit : x1000 US$

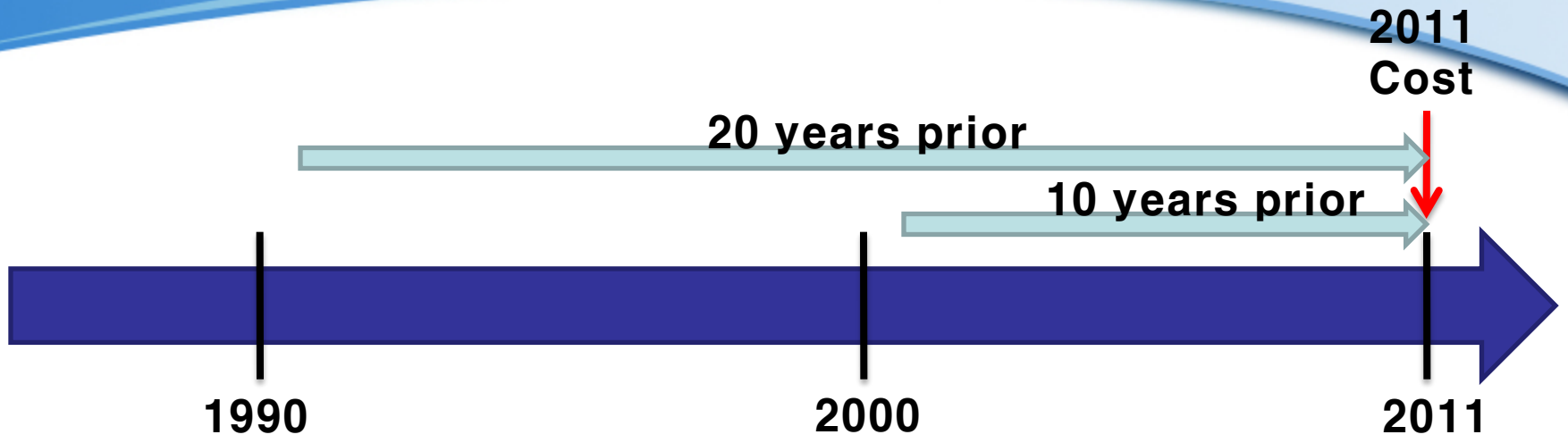
	Disease	Men	Women	Total
1	Mouth and oropharyngeal cancer	6,171	793	6,964
2	Esophageal cancer	13,457	5,079	18,536
3	Colorectal cancer	39,194	6,085	45,279
4	Liver cancer	14,755	3,466	18,221
5	Laryngeal cancer	2,493		2,493
6	Breast cancer		3,744	3,744
7	Other neoplasm	12,027		12,027
8	Diabetes	125,276	54,442	179,718
9	Alcohol use disorders	40,651	21,858	62,509
10	Unipolar depressive disorder	4,776	5,965	10,741
11	Degeneration of nervous system	74	33	107
12	Alcoholic polyneuropathy	102		102
13	Hypertension	296,613	135,822	432,435
14	Ischemic heart disease	68,095	45,654	113,749
15	Alcoholic cardiomyopathy	87		87
16	Cardiac arrhythmia	7,030	2,860	9,890
17	Heart failure	10,825	6,541	17,366
18	Hemorrhagic stroke	61,447	30,239	91,686
19	Ischemic stroke	140,073	66,874	206,947
20	Other encephalopathy	51,364	28,170	79,534
21	Esophageal varices	1,390	1,010	2,400
22	Gastro-oesophageal haemorrhage	447		447
23	Alcoholic gastritis	113	29	142
24	Alcoholic liver disease	15,342	8,002	23,344
25	Liver cirrhosis		3,884	3,884
26	Cholelithiasis	7,006	4,222	11,228
27	Acute/chronic pancreatitis	6,027	775	6,802
28	Alcohol-induced chronic pancreatitis	421	278	699
29	Alcohol poisoning	67	34	101
		925,324	435,861	1,361,185

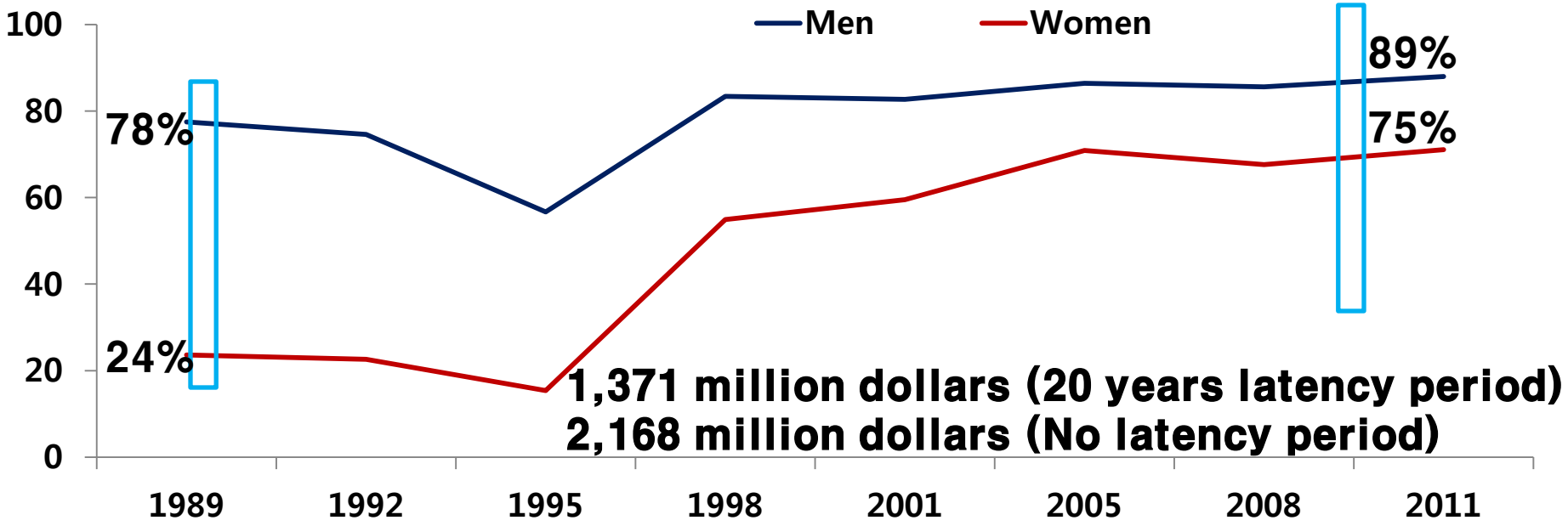
References: 1. Schulz et al. (1991), 2 English et al. (1995), 3. Single et al. (1998), Rehm et al. (2006), 5. Rehm et al. (2007).

Top 10 Diseases Attributed by Alcohol Drinking in Korea



Do we need a latency period ?





Limitation

- No data on types of alcohol beverages.
- Alcohol consumption variables data were collected through a questionnaire.
- Alcohol consumption is likely to change over a follow-up period of 20 years.

Summary I

- RR & PAR of Alcohol-caused Disease
  - Alcoholic cardiomyopathy (3.65, 67.3%), alcoholic polyneuropathy (2.75, 57.6%), and esophagus (2.72, 57.1%) in men
  - Alcohol-induced chronic pancreatitis (2.79, 29.6%), alcohol use disorders (2.39, 24.6%), and esophageal varices (2.38, 24.5%) in women

Summary II

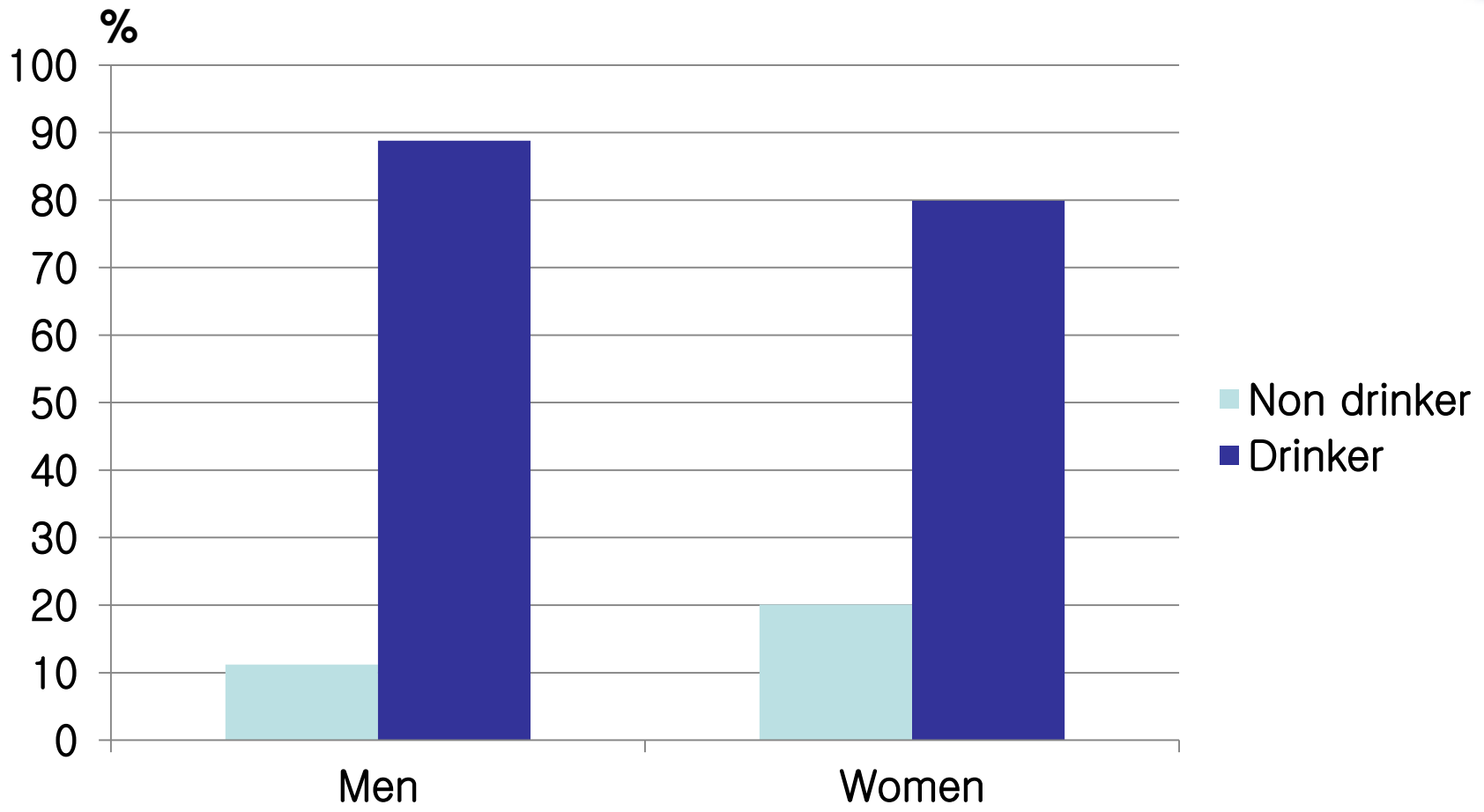
- In 2011, the annual medical cost by drinking was about 1,371 million dollars (US).
- In 2011, the total medical cost with insurance was about 3% of 42,751 million dollars (US).
- The medical cost due to hypertension, ischemic stroke, diabetes, and ischemic heart disease was more than 1,000 million dollars (US).

Conclusion

- **In Korea, alcohol drinking is an independent risk factor for a number of major cancers and other diseases.**
- **The findings affirm the need for aggressive alcohol drinking control in Korea in order to minimize the epidemic of diseases caused by alcohol.**

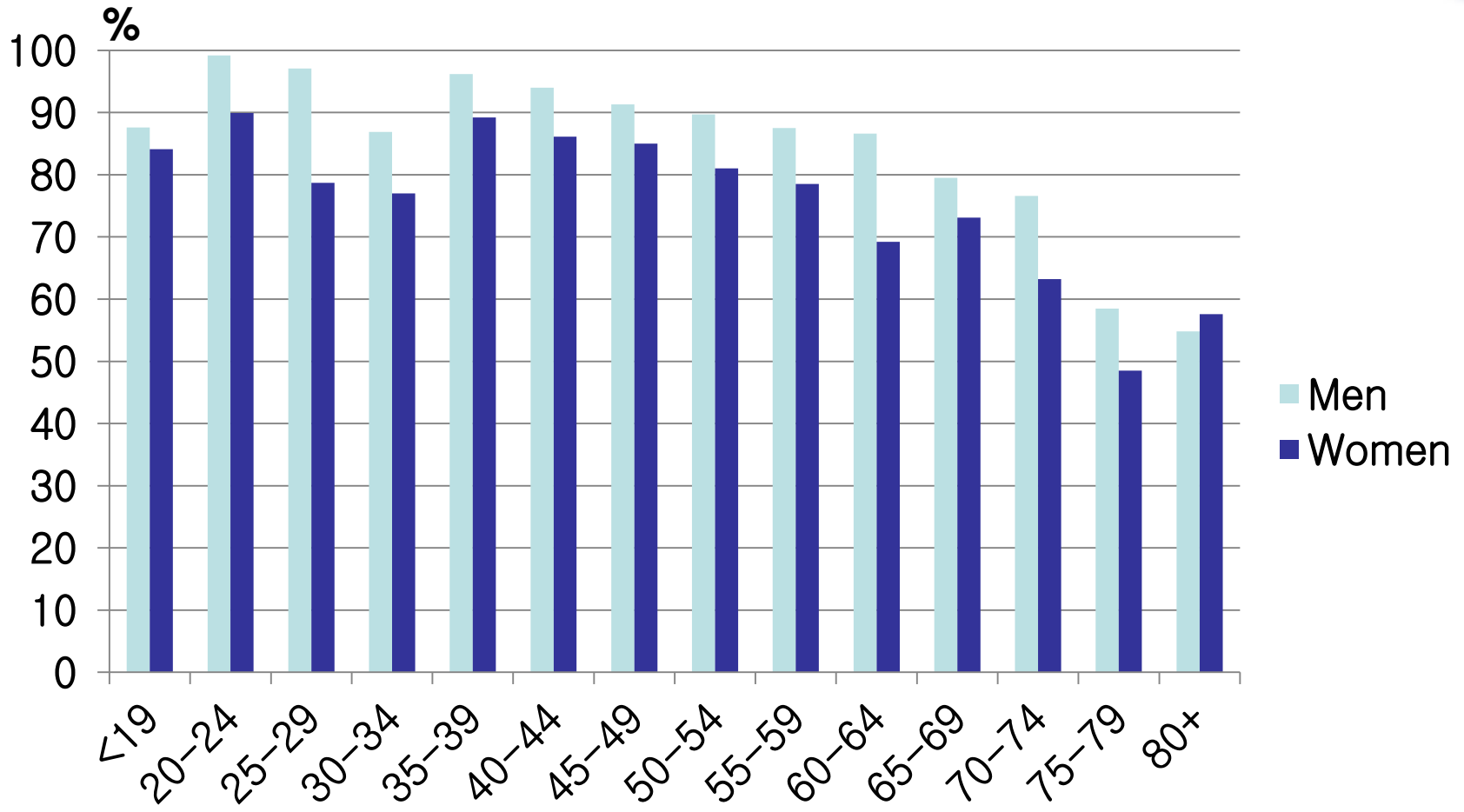

Thank you for your attention

Prevalence of alcohol drinking in Korean adults, 2010 KNHNS



국민건강영양조사
Korea National Health & Nutrition Examination Survey

Prevalence of alcohol drinking in Korean adults (age-specific), 2010 KNHNS



국민건강영양조사
Korea National Health & Nutrition Examination Survey

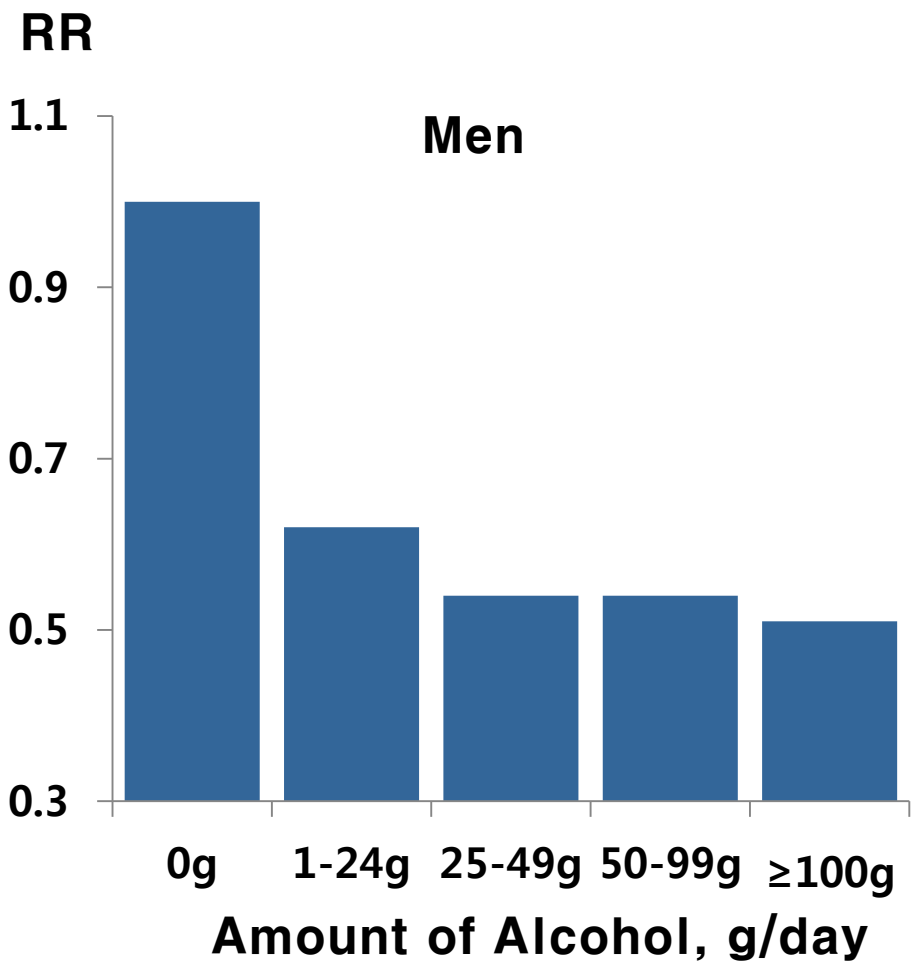
Accordingly, binge drinking was defined as having6 drinks of one or 2 types of alcoholic beverage on one occasion.

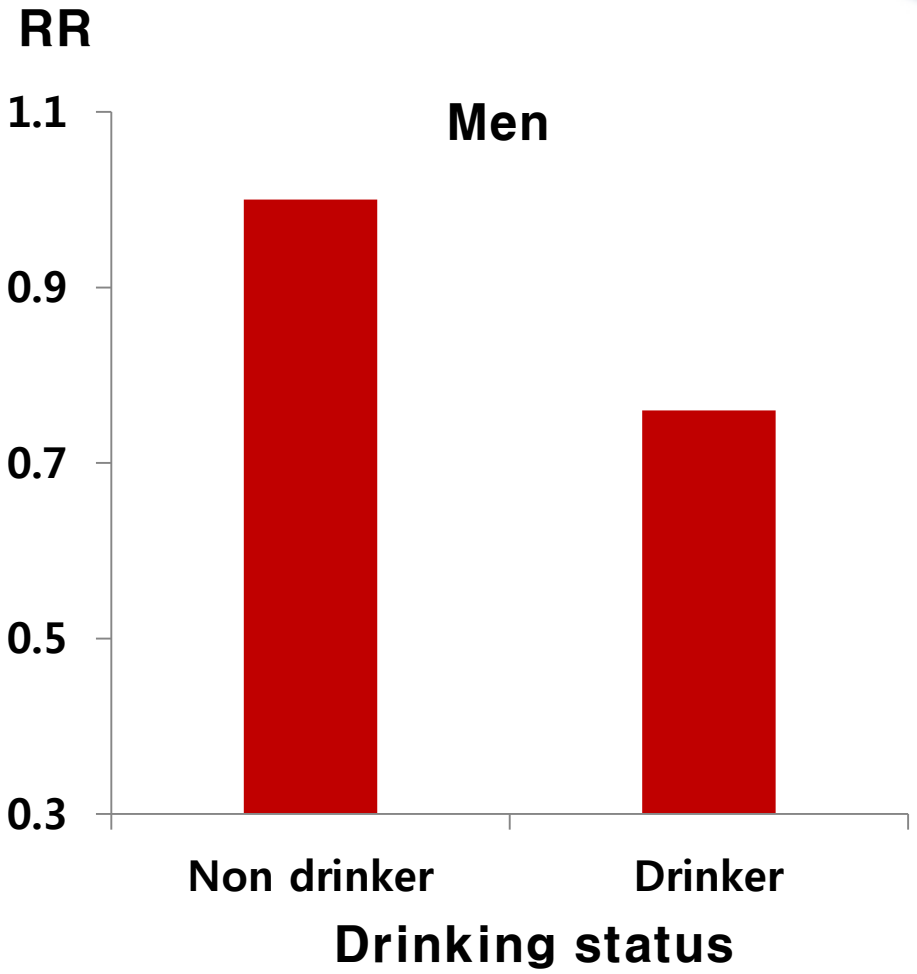
Daily binge drinking increased the risk by 3.39 (1.38–8.35) times. in particular, the hazard ratio (95% CI) of mortality from hemorrhagic stroke was 3.39 (1.38 to 8.35).

According to The Third Korea National Health and Nutrition Examination Survey (NHANES) in 2005, in which a heavy drinker was defined as a person who drinks more than 6 glasses or 60 grams of soju "for men" or more than 4 glasses or 40 grams of soju "for women" at least once a week, 46.3% of men and 9.2% of women were heavy drinkers in Korea. Soju is a distilled alcoholic beverage native to Korea, and is similar to liquor or Japanese shochu; makkoli is an unfiltered alcoholic beverage, also native to Korea. In 1985, at the time the Kangwha Cohort survey began, the pure alcohol content was 25% for soju and 6% for makkoli.

Numerous studies have shown that alcohol consumption is associated with risks of oral cancer, esophageal cancer, liver cancer, colon cancer, and breast cancer

RR of AMI by amount of alcohol and drinking status in Korea





*Adjusted for age, age square, body mass index and smoking status