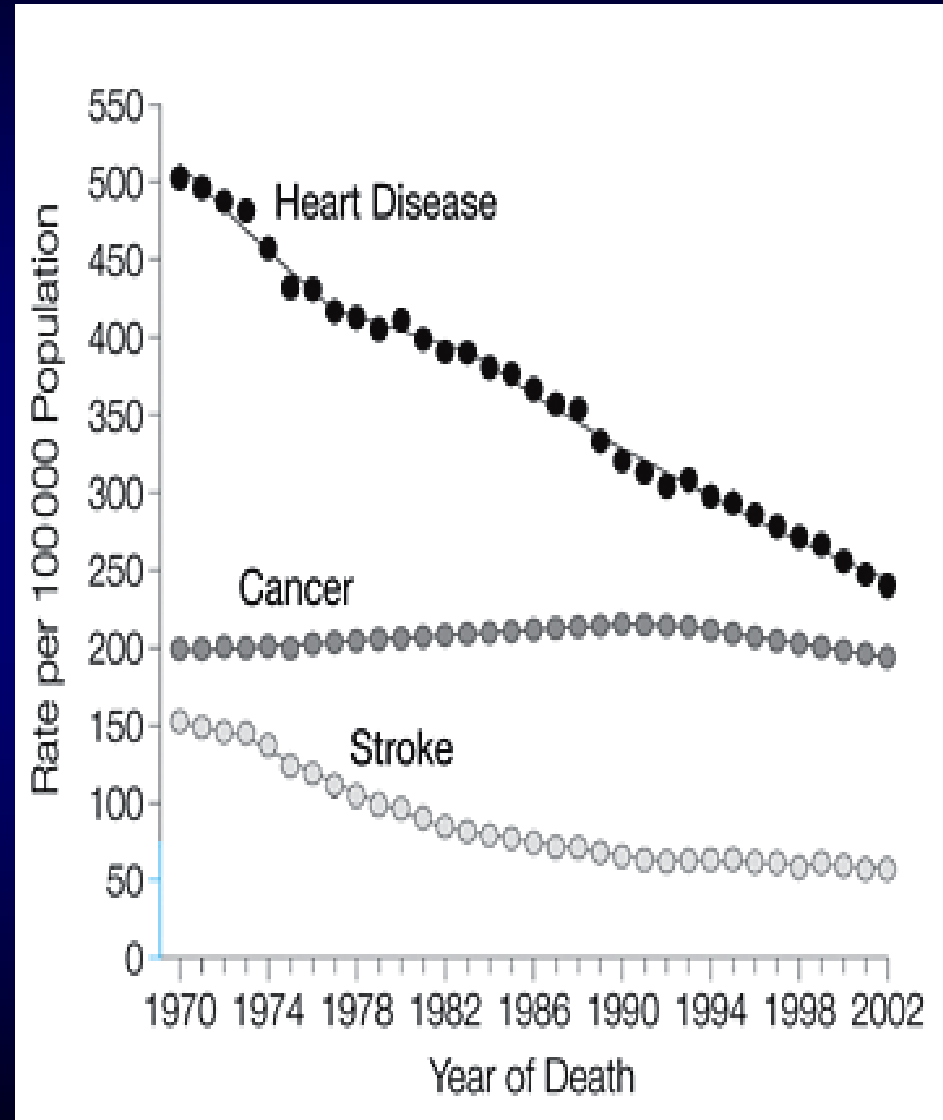
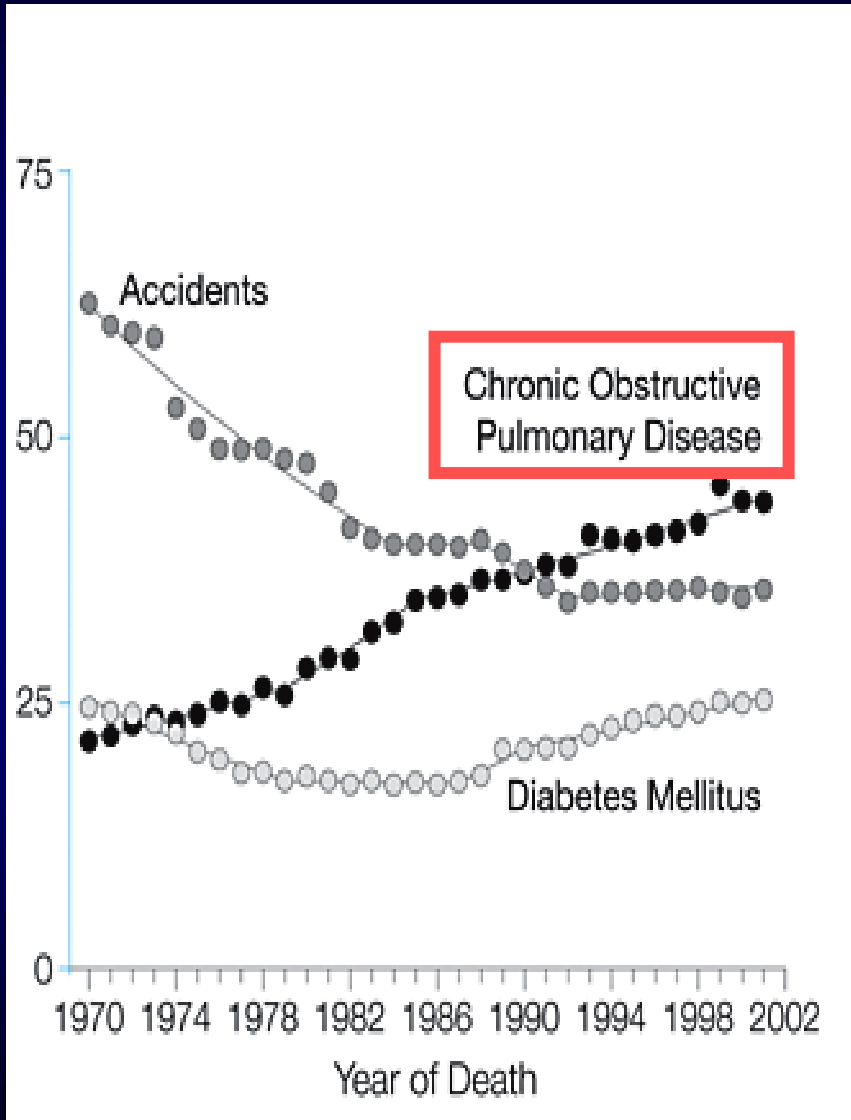


COPD in Korea

Division of Pulmonary, Allergy and
Critical Care Medicine of Hallym
University Medical Center

Park Yong Bum

Mortality Rate 1970-2002, USA



Global Burden of Disease: WHO & World Bank

COPD

*1990: 6th; leading cause of death
12th leading cause of disability

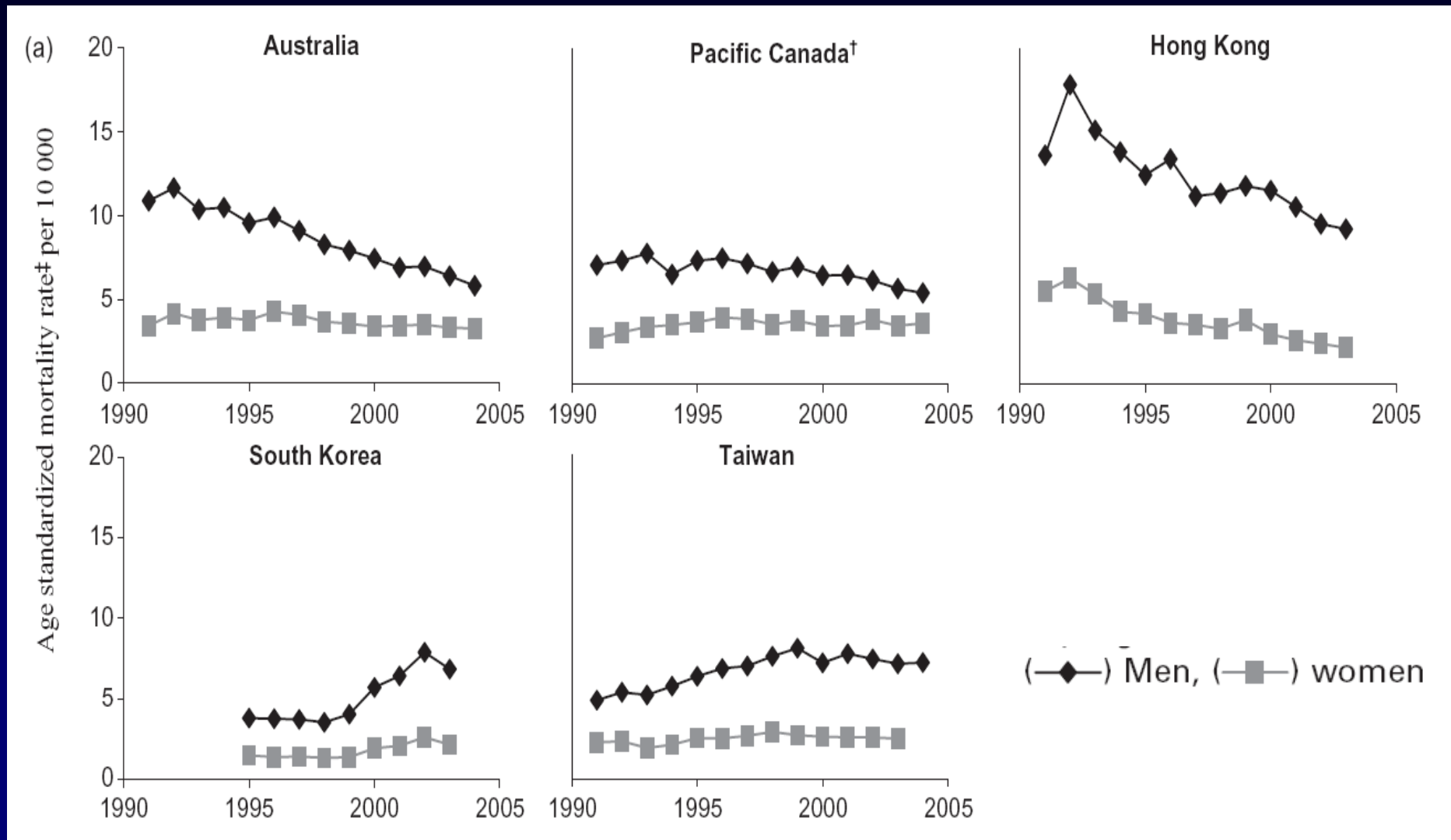
*2020: 3rd leading cause of death
5th leading cause of disability.

COPD mortality and hospitalization of Asia-Pacific: Tan WC, Respirology 2009.

Table 2 Weighted average COPD mortality and hospitalization rates (per 10 000) and gender and age group COPD mortality and hospitalization rate ratios for aged ≥ 40 years by country/region during the period 1991–2004

Country/region	Data type	Weighted average rate (per 10 000)	Relative rates [†]			
			Group comparisons			
			Gender	Age (years)		
			Male vs female	55–64 vs 40–54	65–74 vs 40–54	75+ vs 40–54
Australia	Mortality	5.6	2.1	7.7	33.2	98.8
	Hospitalization	47.8	1.8	5.5	16.1	28.3
Pacific Canada [‡]	Mortality	4.8	1.7	7.5	34.5	132.2
	Hospitalization	26.9	1.4	5.3	16.6	31.4
Hong Kong	Mortality	7.3	3.0	7.4	33.1	128.4
	Hospitalization	87.1	4.4	9.2	38.7	106.9
South Korea [§]	Mortality	3.0	2.7	4.5	19.7	103.0
	Hospitalization	c	c	c	c	c
Taiwan	Mortality	4.6	2.4	4.4	19.4	102.4
	Hospitalization	53.9	3.0	6.0	22.9	61.5

COPD mortality of Asia-Pacific: Tan WC, Respirology 2009.



COPD Prevalence Survey: Halbert RJ, Chest 2003.

- Reviewed published studies
- **No. of Studies: 32**
- **Prevalence: 0.23 - 18.3%.**
 - * **Spirometry: 11**
 - * **Respiratory symptoms: 14**
 - * **Patient-reported disease: 10**
 - * **Expert opinion.**
- **Reasonably representative sample : 16**
 - 4% - 10%**
 - All from Europe or North America**

COPD Definition: GOLD

Airflow limitation
Not fully reversible.

Dx: Pulmonary Function Test

COPD Prevalence: Spirometry

- Difficult and Expensive
- Nationally representative sample: 4

Halbert (Chest 2003):

* USA: NHANES III: 6.8%

* Denmark: 3.7%

* Italy: 11.0%

* Spain: IBERPOC: 9.1%

NHANES III, USA

- 1988-1994
- A total of 81 sites .
- Subjects: 20,050 adults:
- **16,084 subjects** available for analysis: representing 169.3 million adults

Overall Prevalence: NHANES

Adults > 20 years of age

- OLD : 6.8%
- Reported OLD : 8.5% (0.3%)
- Current smokers : 12.5% (0.7%),
- Former smokers: 9.4% (0.6%),
- Never smokers: 5.8% (0.4%)

COPD in Korea

- High frequency of smokers
- Heavy environmental pollution

COPD prevalence ?

- Questionnaires survey :
Not reliable

The 1st Nationwide COPD Survey

Korean Academy of Tuberculosis and
Respiratory Diseases

Using Spirometry
Nationally representative sample

Korean NHANES

Korean Institute of Health and Social Affairs.

Subjects and Methods

Korean NHANES II

A stratified multistage clustered probability design

- 200 survey areas selected randomly.
- Total No. (older than 18 yrs):
9,243. (M: 4351, F: 4892).

Korean NHANES II

- Oct.15, 2001 - Jan.15, 2002
- **Contents:**
 - 1) Qs: health status, socioeconomic, behavioral aspects + **COPD Qs.**
 - 2) Nutritional Survey: Qs
 - 3) Physical measurements, **PFT, CXR**

Respiratory Questionnaires

1. Has a doctor ever told you that you had chr. bronchitis, emphysema, or COPD?
2. Do you bring up phlegm on most days for 3 m or more consecutive m per year? If yes, how many years?
3. Do you usually cough on most days for 3 or more consecutive m per year? If yes, how many years?
4. Are you troubled by SOB when hurrying on level ground or walking uphill?"
5. Has a doctor ever told you that you had asthma?
6. Have you had wheezing or whistling in your chest at any time in last 12 ms?
 - 1.1 Have you been at all breathless when the wheezing noise was present?
 - 1.2 Have you had this wheezing or whistling when you did not have a cold?
7. Have you had an attack of asthma (sudden bouts of cough and shortness of breath with wheezing) in the last 12 months?
8. Are you currently taking any medication, (including inhalers, aerosols or tablets) for asthma
9. Walking 400m (5-10 min walking distance), or carrying things about 4 kg is
10. Because of these sx or health problem, do you need help for a ordinary activity?

COPD Survey: Method

2) Spirometry:

- * Dry rolling spirometer 2130 (Sensor Medic, USA)
- * ATS Standard by trained technicians.
- * QA: **Review center**: Review all the test results and feed back within one day.

3) Chest X-ray: special mobile cars

- Two qualified radiologist were evaluated the X-ray.

Definition

COPD:

- Obstructive Lung Disease (GOLD)
(FEV₁/FVC < 70%)
- in the subject older than 45 yrs

COPD Severity

- **GOLD I: Mild:** $FEV_1 > 80\%$.
- **GOLD II: Moderate:** $50\% < FEV_1 < 80\%$.
- **GOLD III: Severe:** $30\% < FEV_1 < 50\%$
- **GOLD IV: very severe:** $FEV_1 < 30\%$

Response Rate

	Total		Male		Female	
	No.	%	No.	%	No.	%
Questionnaire	8,209	88.8	3,749	86.2	4,460	91.2
PFT: Done	4,816	52.1	2,120	48.7	2,696	55.7
PFT: Adequate	3,981	43.1	1,826	42.0	2,155	44.1
CXR	4,882	52.8	2,118	48.7	2,764	56.5

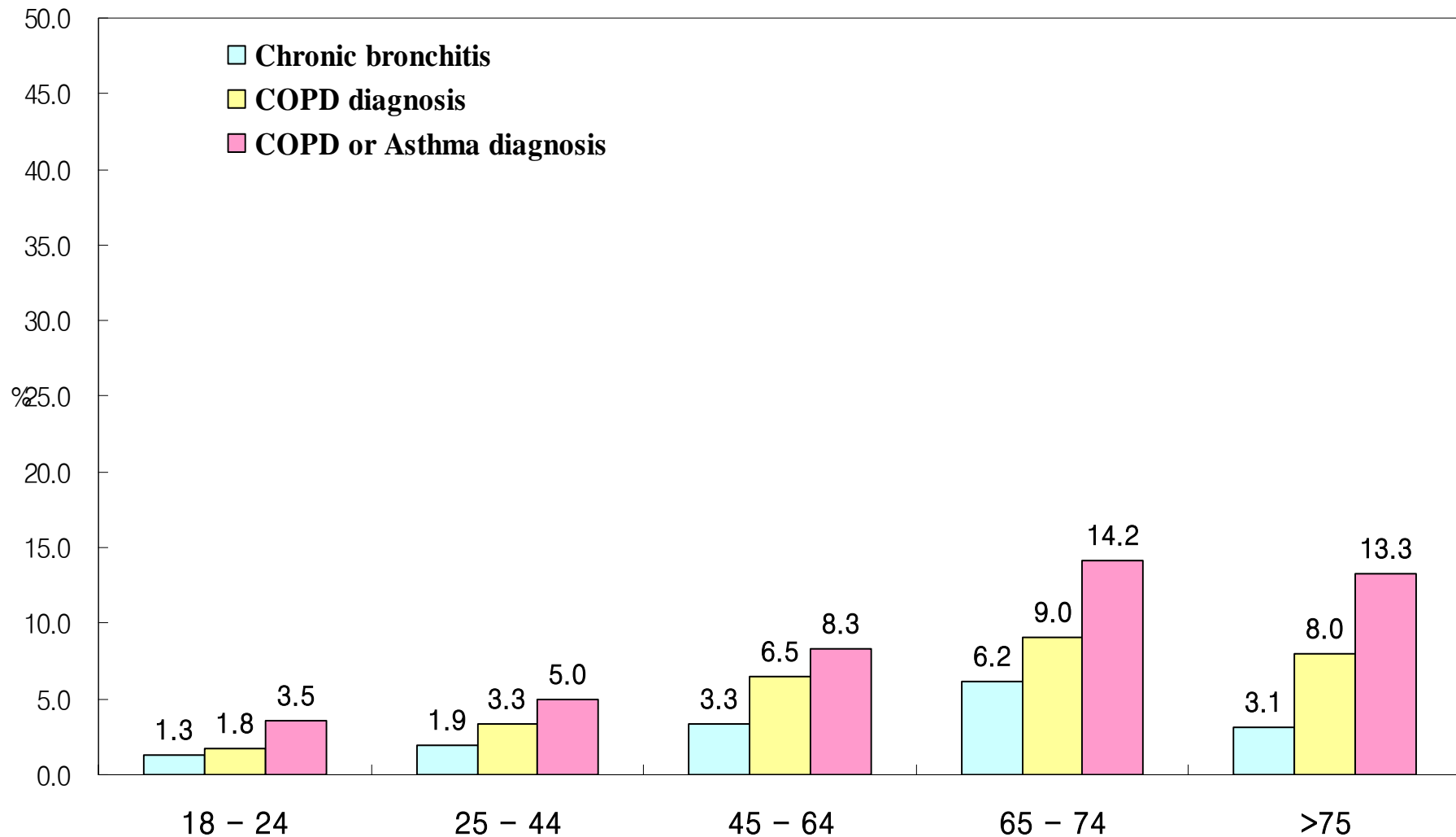
Result:
Questionnaires

Prevalence of Smokers :

(weighted value)

	Total			Male			Female		
	Total	<45Y	>45 Y	Total	<45Y	>45 Y	Total	<45Y	>45 Y
Never	61.5	63	60	22	24	18	93	95	91
Former	8.6	5.6	13	17	11	28	1.6	1.6	1.6
Current	30	32	27	61	67	54	5.2	3.7	7.3
< 10 PY	16	22	9.3	31	43	14	4.6	4.9	4.1
10-20	8.8	9.7	7.6	19	22	15	1.0	0.1	2.3
>20 PY	13	5.1	23	28	11	51	1.0	0.1	2.3

Prevalence of Physician Dx of COPD/Asthma: Stratified by Age



COPD Prevalence

Age-specific percentage of subjects with airflow obstruction (%)

Age (yr)	Total	Male	Female
18-24	1.9	1.1	2.7
25-44	2.5	3.6	1.6
45-64	10.7	17.4	4.9
65-74	35.0	52.4	19.0
> 75	41.4	60.0	21.4
Age > 45	17.2	25.8	9.6
Total	7.8	10.9	4.9

Total No: 3,981. Total No. of OLD: 326 (all stages, FEV1/FVC < 70%)

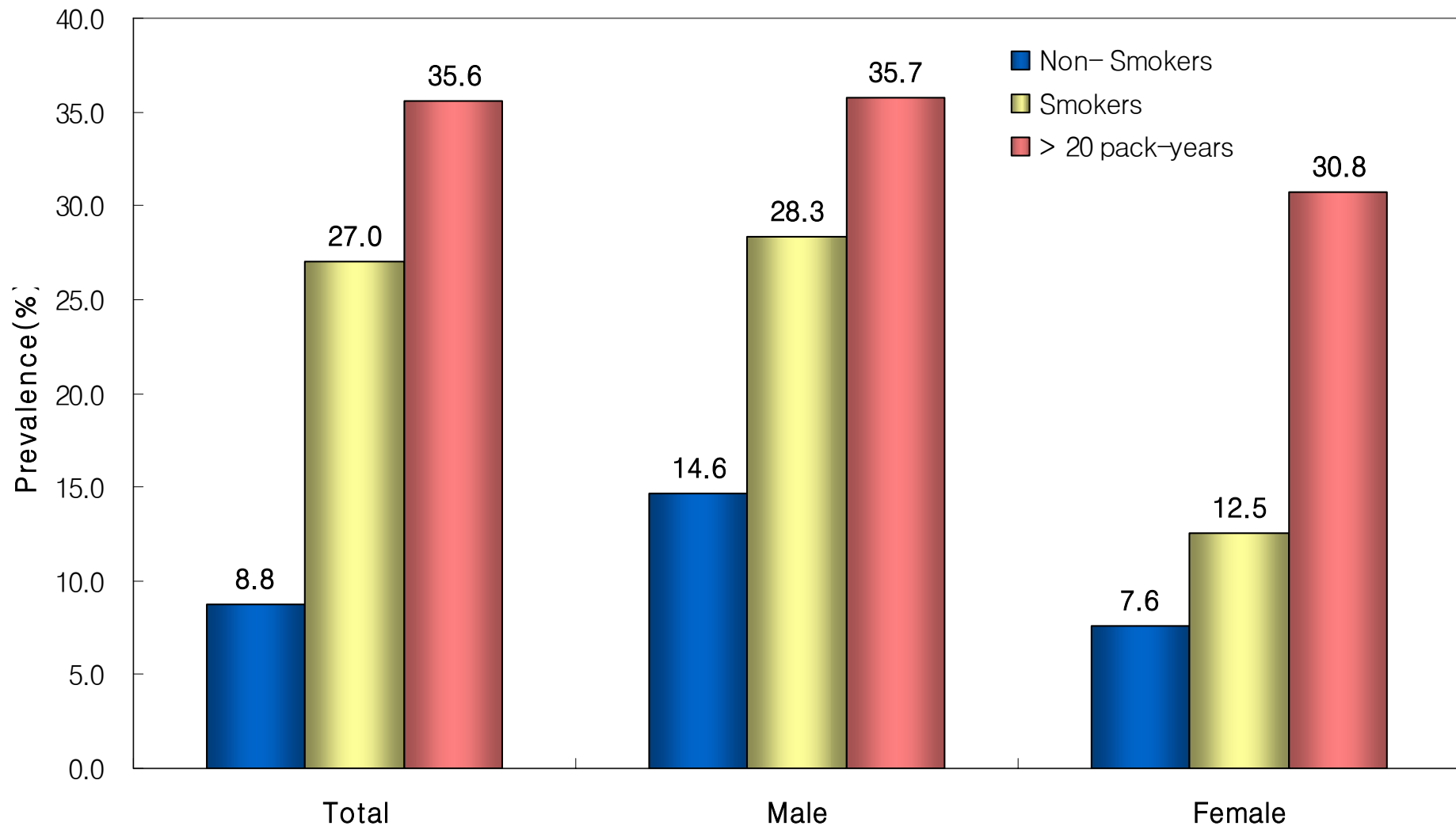
Prevalence of COPD: (>45 yr) Stratified by Gender and the Severity.

(%)

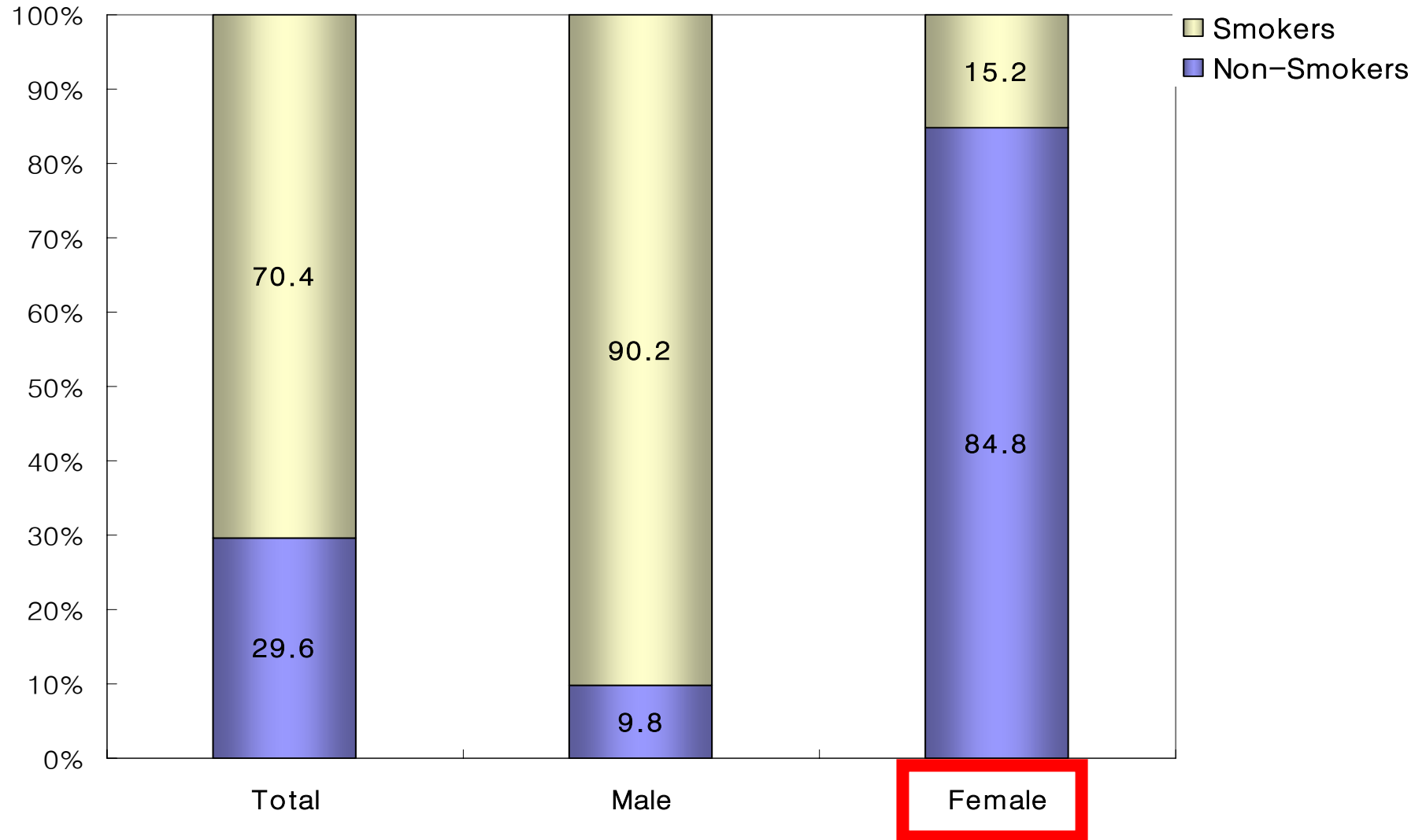
Severity	Total	Male	Female
GOLD I	9.5	14.0	5.6
II. (50% < FEV ₁ < 80%)	6.4	9.3	3.9
III. (30% < FEV ₁ < 50%)	1.1	2.2	0.1
IV. (FEV ₁ < 30% pred.)	0.2	0.3	0
Total	17.2	25.8	9.6

Total No: 3,981. Total No. of OLD: 326 (all stages, FEV1/FVC < 70%)

Prevalence of COPD (GOLD criteria) stratified by Smoking Status



Proportion of Smokers in COPD



Frequency of
Symptoms and Prior Dx.

Frequency of Respiratory Sx and Physician Dx of COPD: > 45 years

	Normal	FEV ₁ /FVC < 70		
		Mild	Moderate	Severe
Cough > 2Y	8.1	2.7	5.8	31.8
Sputum > 2Y	4.4	3.4	6.8	36.4
COPD Dx.	6.8	8.2	16.7	63.6
Chronic Bronchitis	3.8	5.0	8.3	50.0
Asthma Dx	3.1	5.5	19.0	54.6
Medication	1.2	2.1	9.7	36.4

Mild: FEV₁ >80%,

Mod: 50% < FEV₁ < 80%,

Severe: FEV₁ < 50%

Risk Factor Analysis

Risk Factor Analysis

	COPD		Bivariate analysis		Multivariate analysis		
	%	O.R.	p-value	95% C.I.	O.R.	p-value	95% C.I.
Age(Y)							
< 65	10.7						
≥ 65y	36.0	4.7	<.0001	3.5-6.2	4.1	<.0001	2.9-5.6
Gender							
Female	7.9						
Male	25.4	3.95	<.0001	3.0-5.3	2.6	0.0001	1.6-4.2
Area							
Urban	14.7						
Rural	9.2	1.48	0.1398	1.1-2.0	1.0	0.9318	0.7-1.4
Income							
High	12.1						
Low	26.5	2.6	<.0001	2.0-3.5	2.1	0.0001	1.5-3.0
Smoking							
Never	8.8						
0-20 PY	15.9	1.96	0.0223	1.3-2.9	1.4	0.6908	0.7-1.9
>20 PY	35.6	5.74	<.0001	4.2-7.8	2.8	0.0001	1.8-4.5

Summary (1)

1. Prevalence (GOLD criteria):

17.2% (M: 25.8%, F: 9.6%)

2. Majority: Mild ($FEV_1 > 50\%$)

* Severe disease ($FEV_1 < 50\%$): 1.3%
of whole subjects.

Summary (2)

3. COPD Prevalence:

in smokers: 26.9%

nonsmoker: 8.8%

>20 PY: men: 35.7%:,

women: 30.8%

4. In men: 91% of COPD: smokers,
women: 15% of COPD: smokers.

Summary (3)

5. Small minority of COPD ; previously diagnosed
or treated

Severe COPD ; 2/3 ; not received treatment

6. Risk factor by Multivariate analysis

*Old age (>65 yrs: OR: 3.9, 95% CI: 2.6-6.0)

*> 20 pack-year smoking

(OR:3.3, 95% CI: 1.7-6.4)

*Male gender (OR: 2.6, 95% CI:1.6-4.2)

*Low income (OR:2.0, 95% CI: 1.3-2.3).

Conclusion

- The prevalence of COPD in Korean adult population (older than 45 years) was high (17.2%)
- Only small proportion of the subjects with COPD was diagnosed or treated.