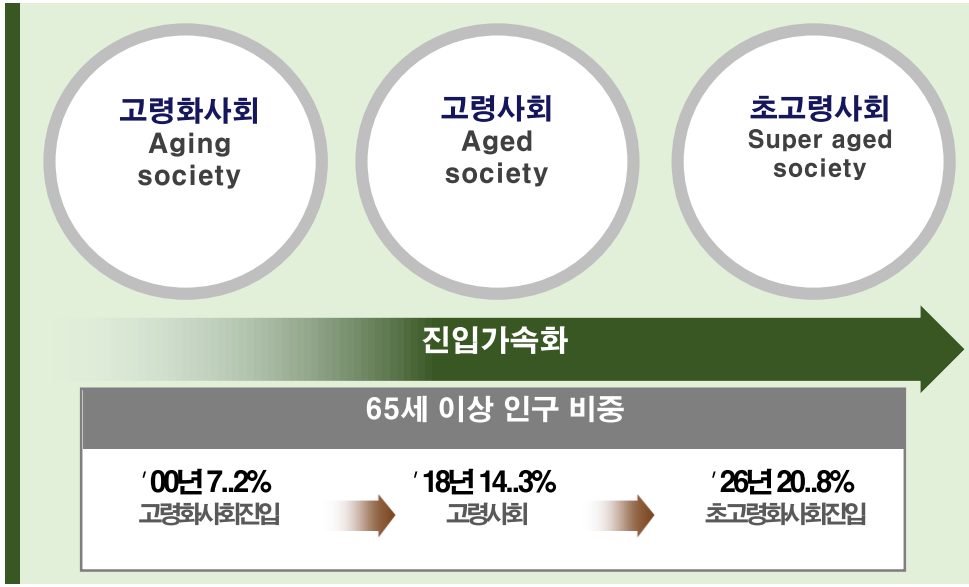
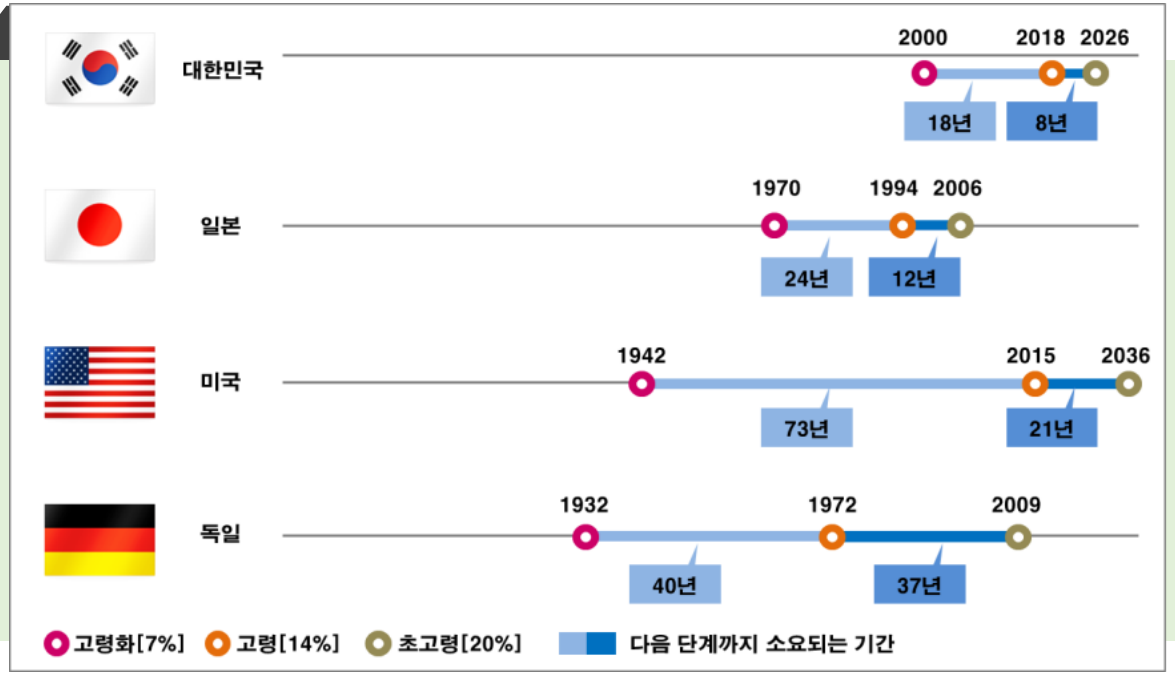
고령화와 호흡기질환

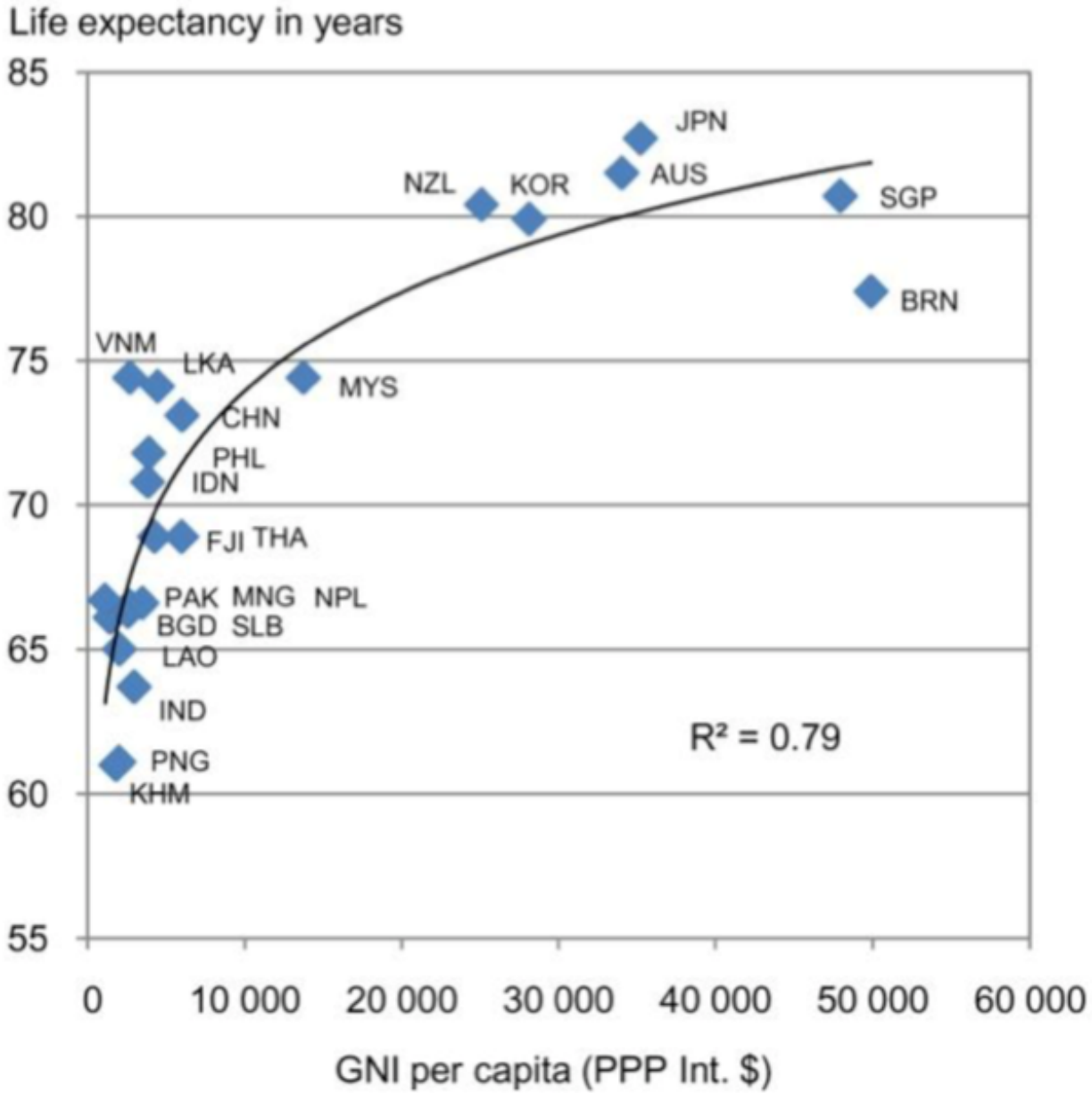
서울의대 윤호일

고령화속도


고령화사회
Aging
society
고령사회
Aged
society
초고령사회
Super aged
society
진입가속화
65세 이상 인구 비중
'00년 7..2%
고령화사회진입
'18년 14..3%
고령사회
'26년 20..8%
초고령화사회진입

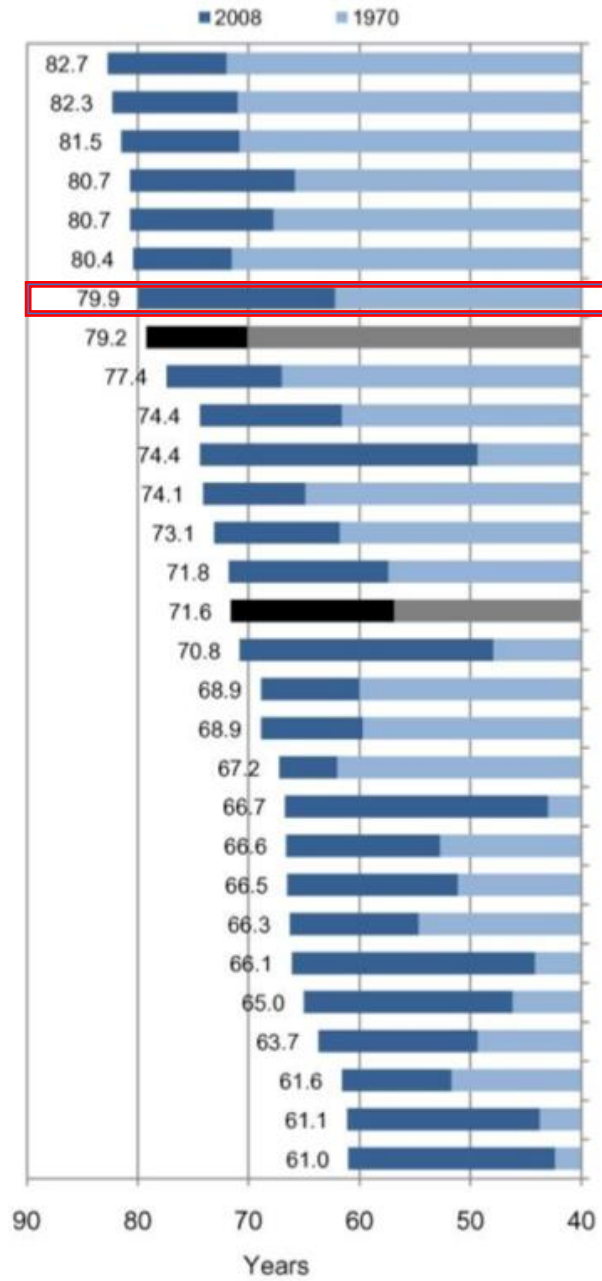

대한민국
2000
2018
2026
18년
8년
일본
1970
1994
2006
24년
12년
미국
1942
2015
2036
73년
21년
독일
1932
1972
2009
40년
37년
고령화[7%]
고령[14%]
초고령[20%]
다음 단계까지 소요되는 기간

1.1.3. **Life expectancy at birth and GNI per capita, 2008**

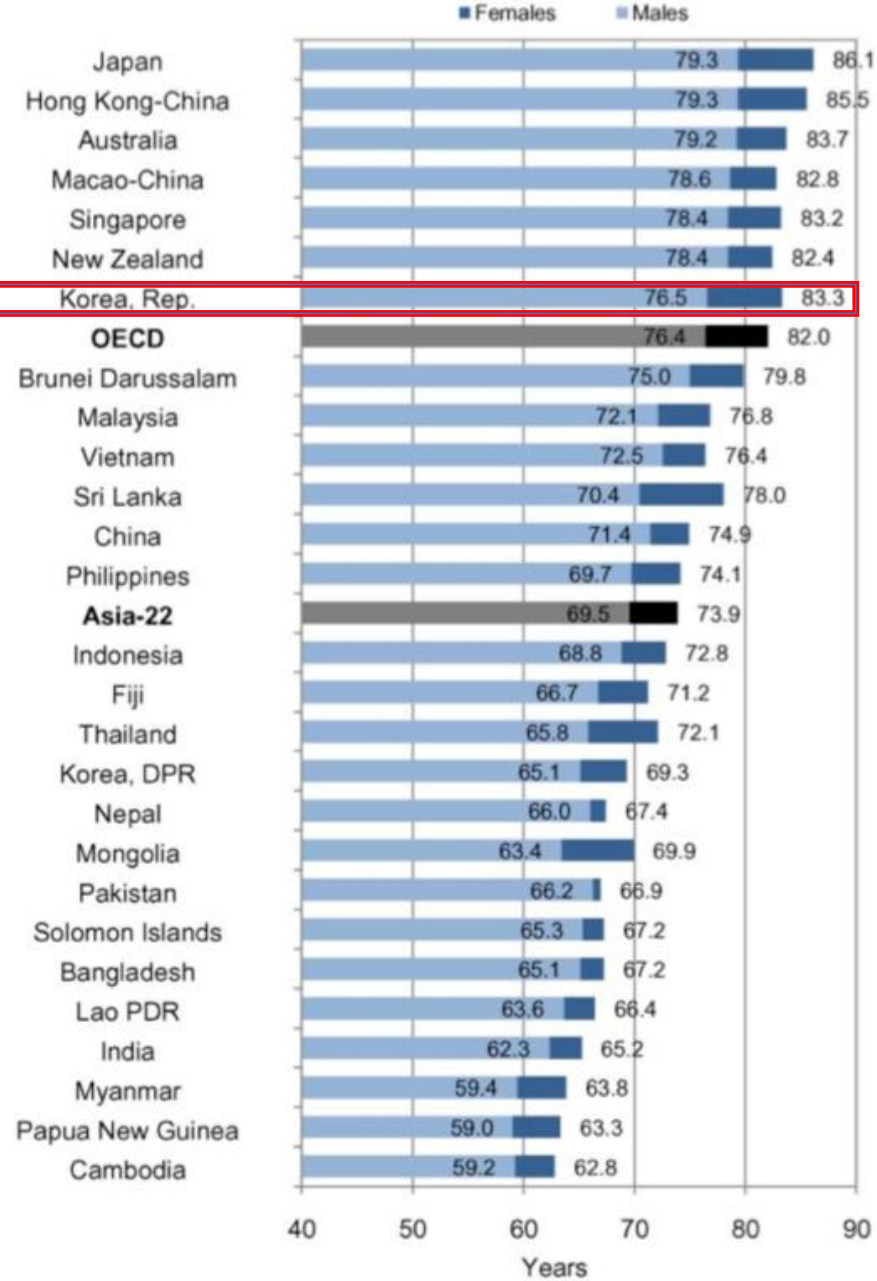


OECD

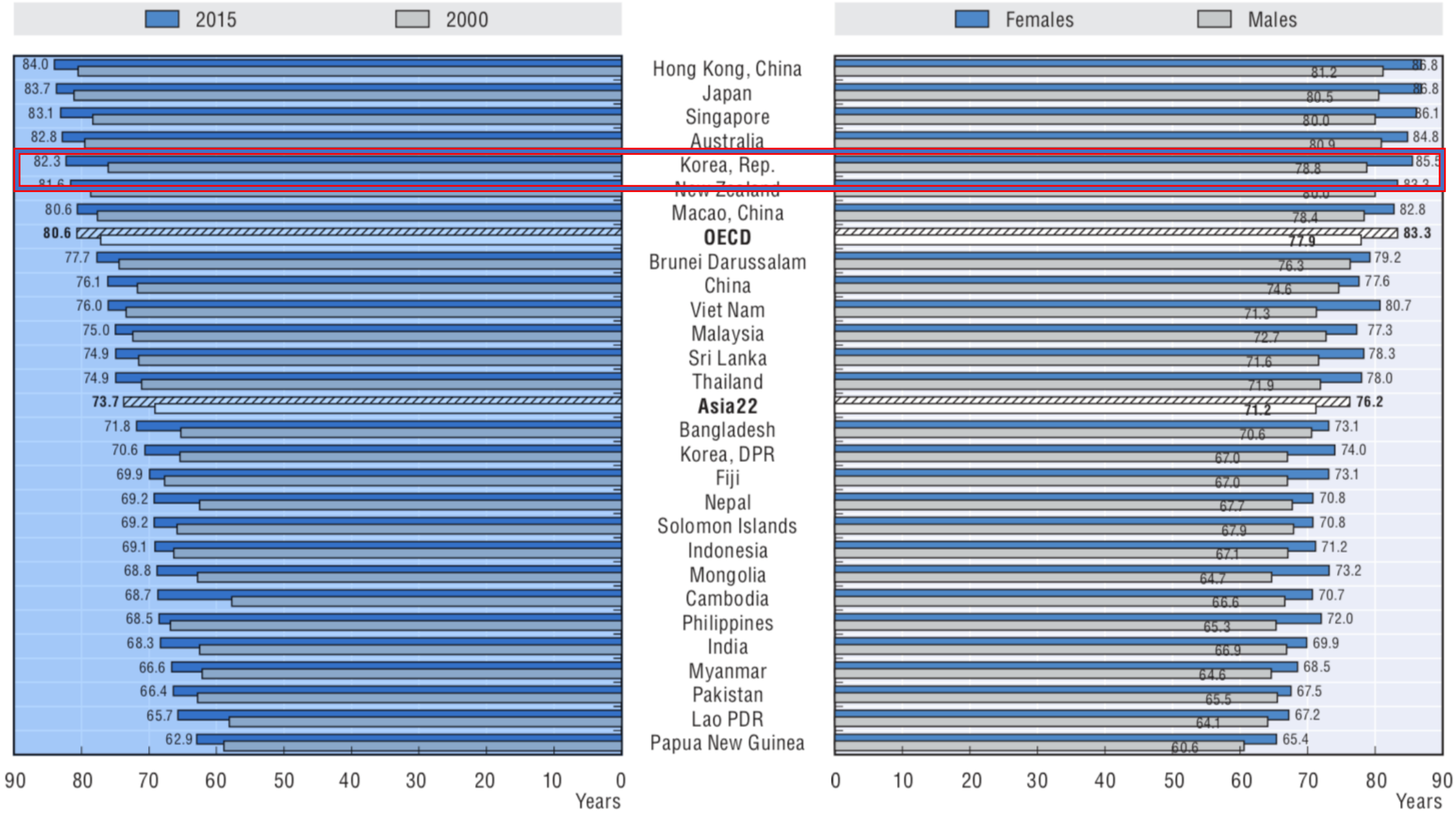
1.1.1. Life expectancy at birth, total population, 1970 and 2008



1.1.2. Life expectancy at birth, by sex, 2008

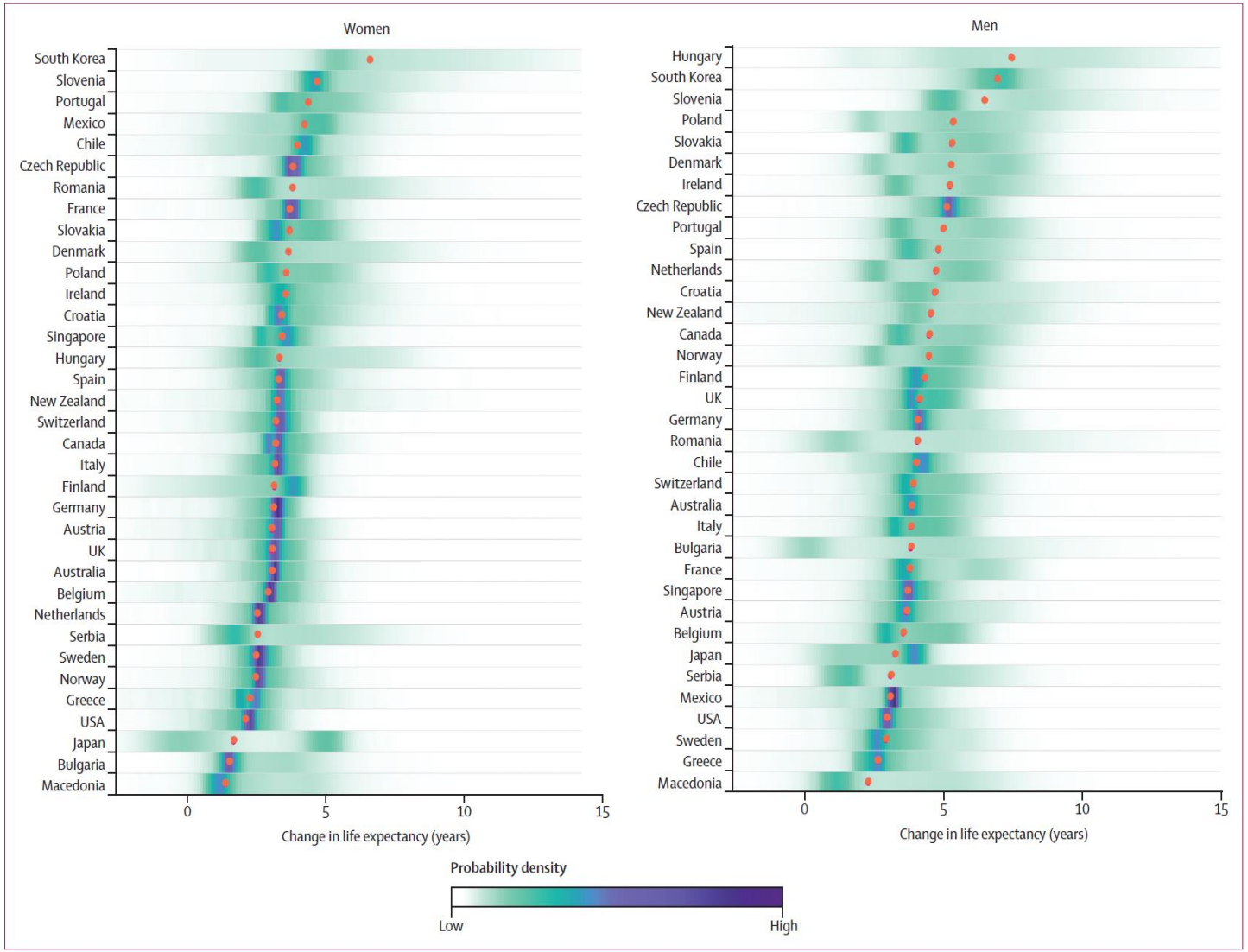


1.1. Life expectancy at birth, 2000 and 2015, and by sex, 2015



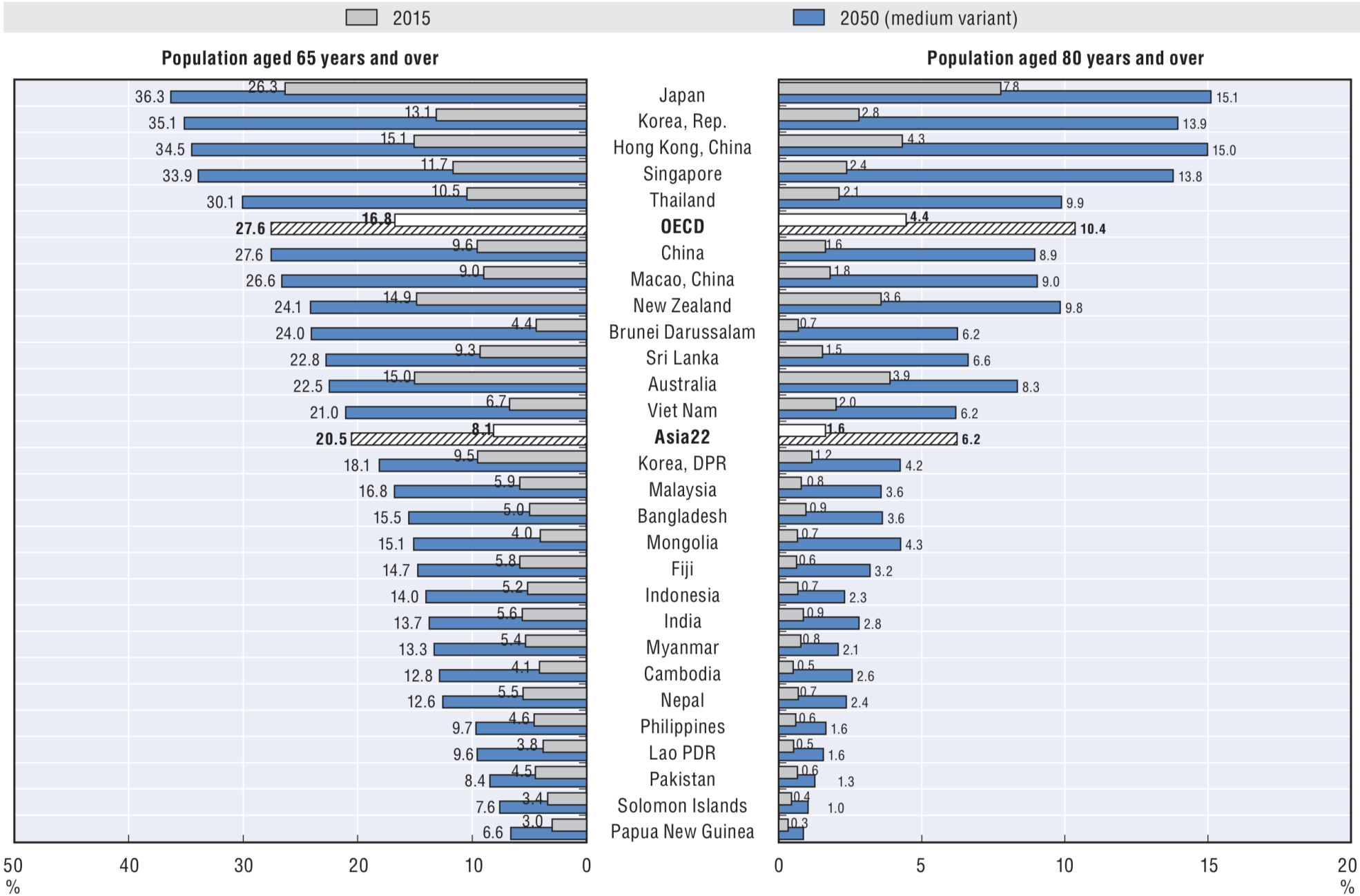
Source: *OECD Health Statistics 2016*; WHO; the World Bank World Development Indicators Online.

In the future…



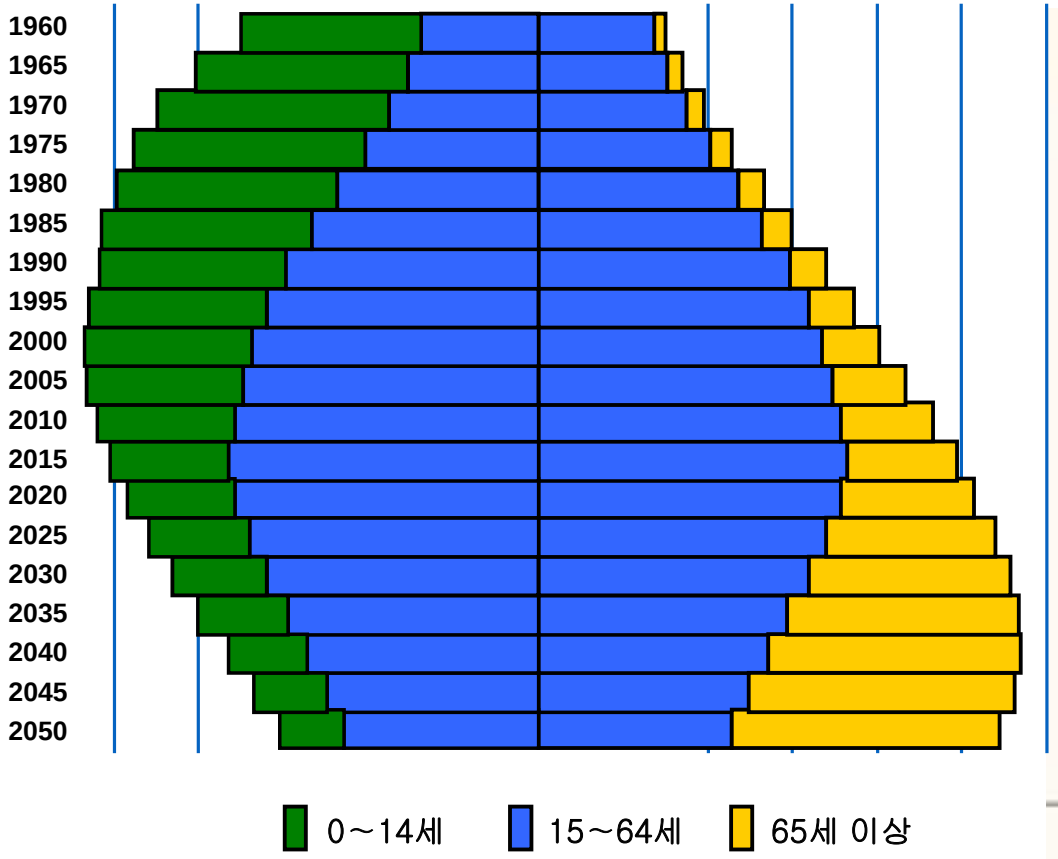
Future life expectancy in 35 industrialized countries, Lancet 2017

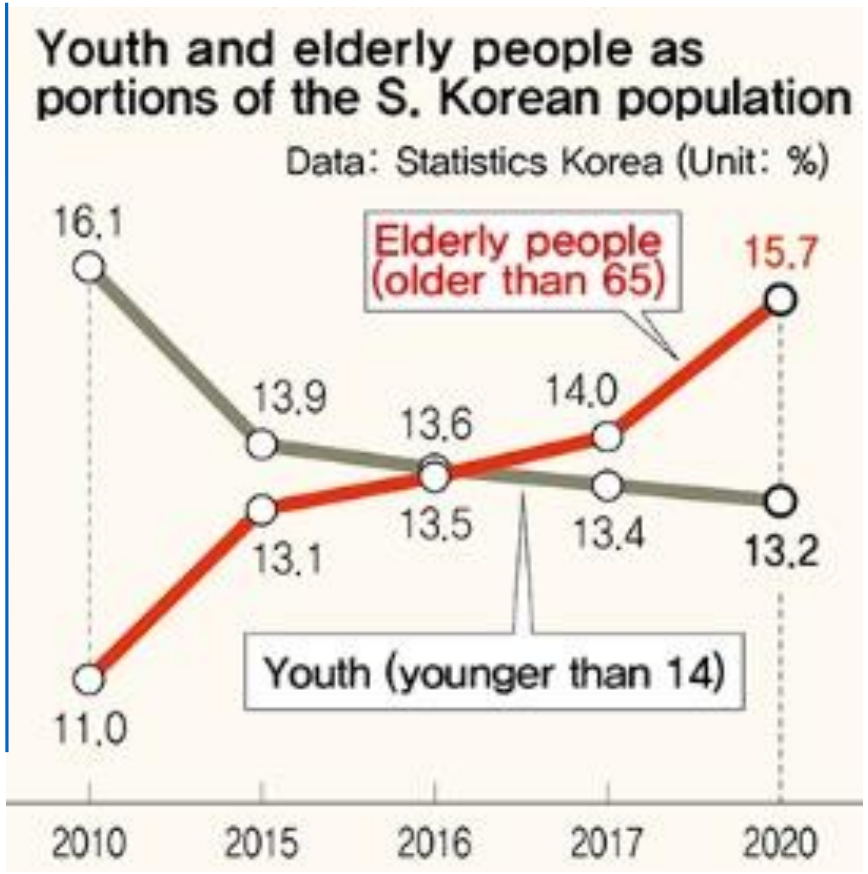
1.34. Share of the population aged over 65 and 80 years, 2015 and 2050



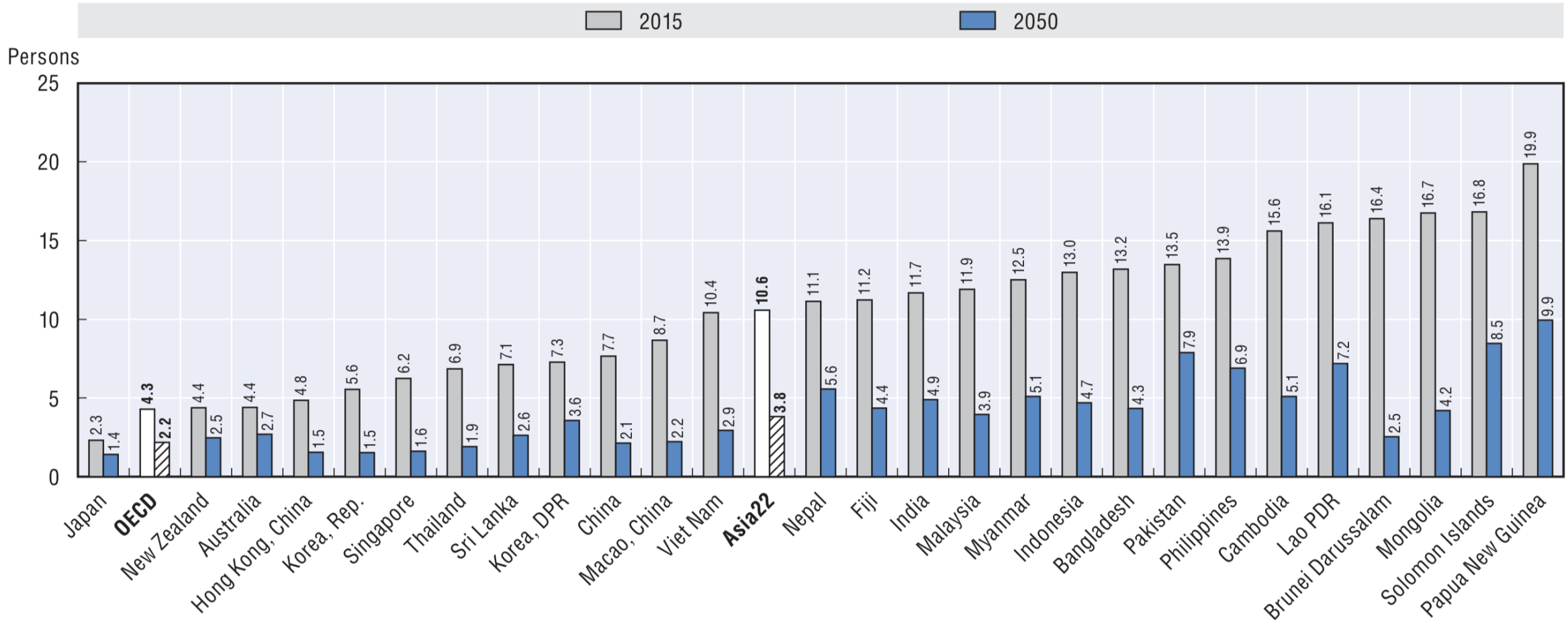
Source: UN World Population Prospects, 2015.

Koreans Are Getting Older





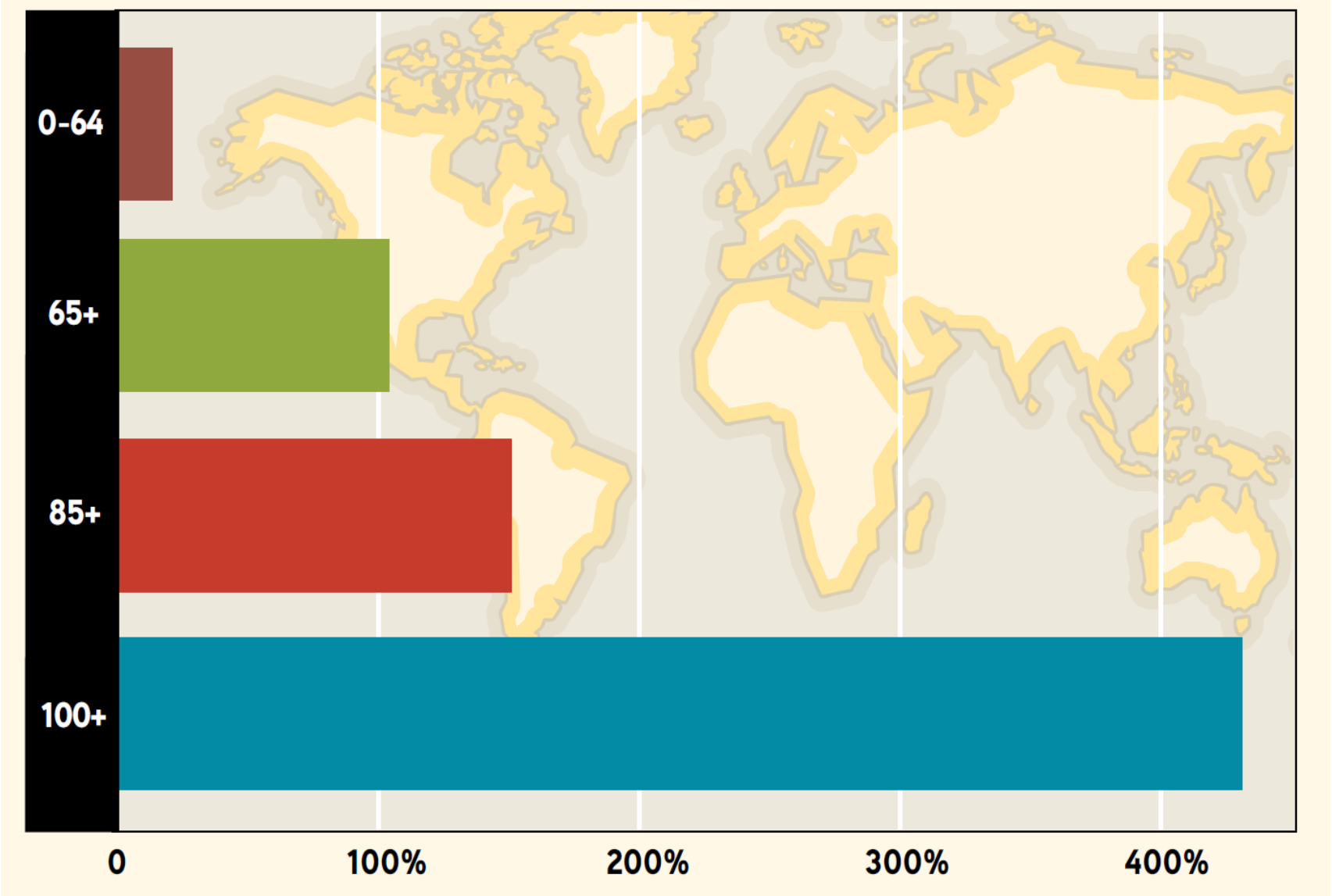
1.35. Ratio of people aged 15-64 to people aged over 65 years, 2015 and 2050



Source: UN World Population Prospects, 2015.

StatLink http://dx.doi.org/10.1787/888933413334

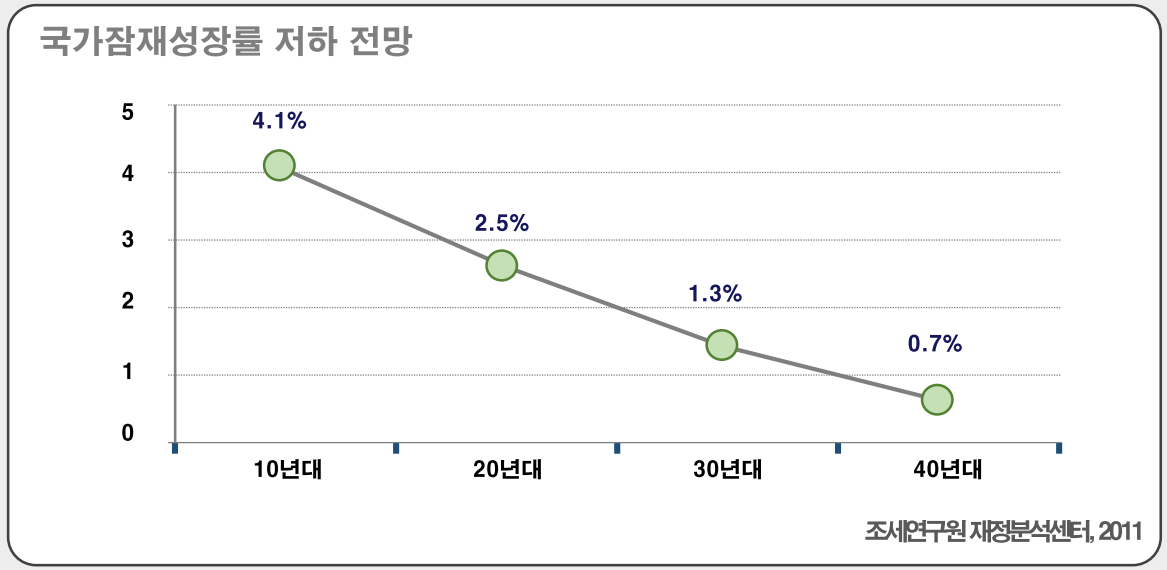
Projected Increase in global population between 2005 and 2030, by Age



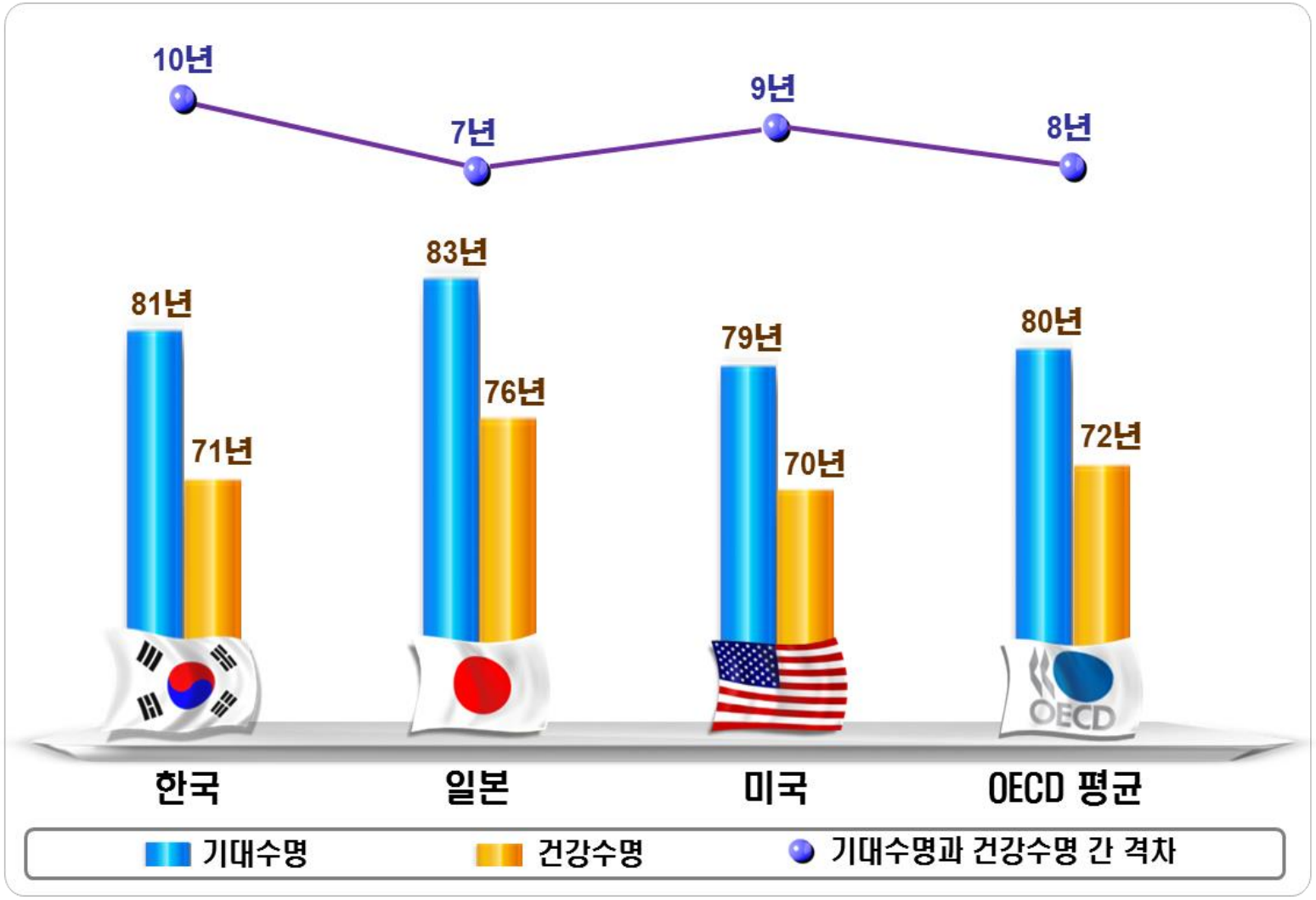
잠재성장율

평균근로연령 상승

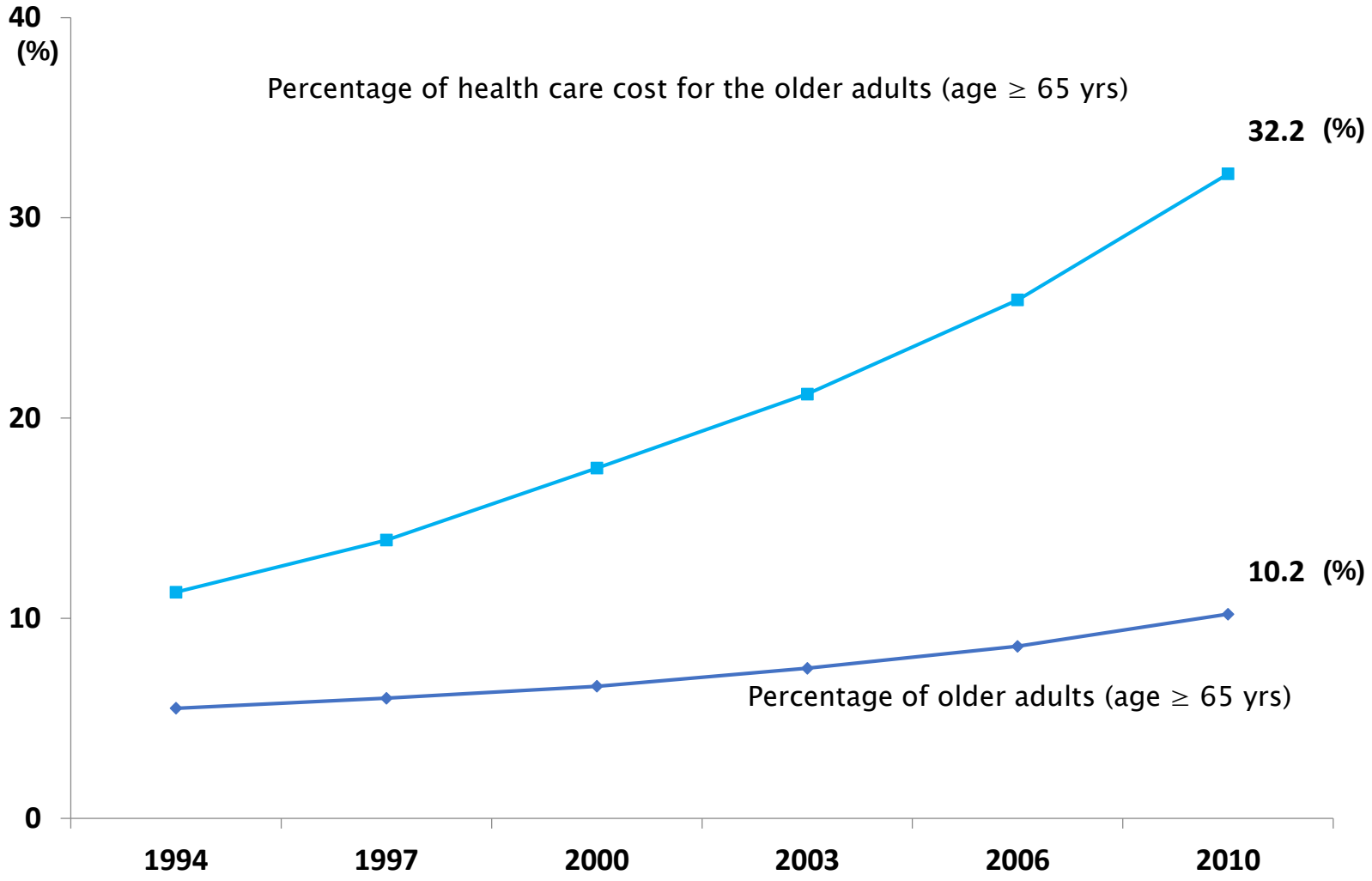
- 생산성저하
- 소비/투자 위축에 직결
- 경제 잠재성장률 하락
- 국가경쟁력 감소의 원인



Gap between life expectancy & healthy life expectancy



Rapid increase of health care cost for the elderly



고령화와 의료비

- '09년~'10년 OECD 회원국 중 국민의료비 지출 증가율 1위(8.5%)
- '20년 예상 GDP 대비 의료비 지출 비율 11.5%(OECD 평균 9.7%) 및 보험재정 적자 약 -17조원 수준 전망

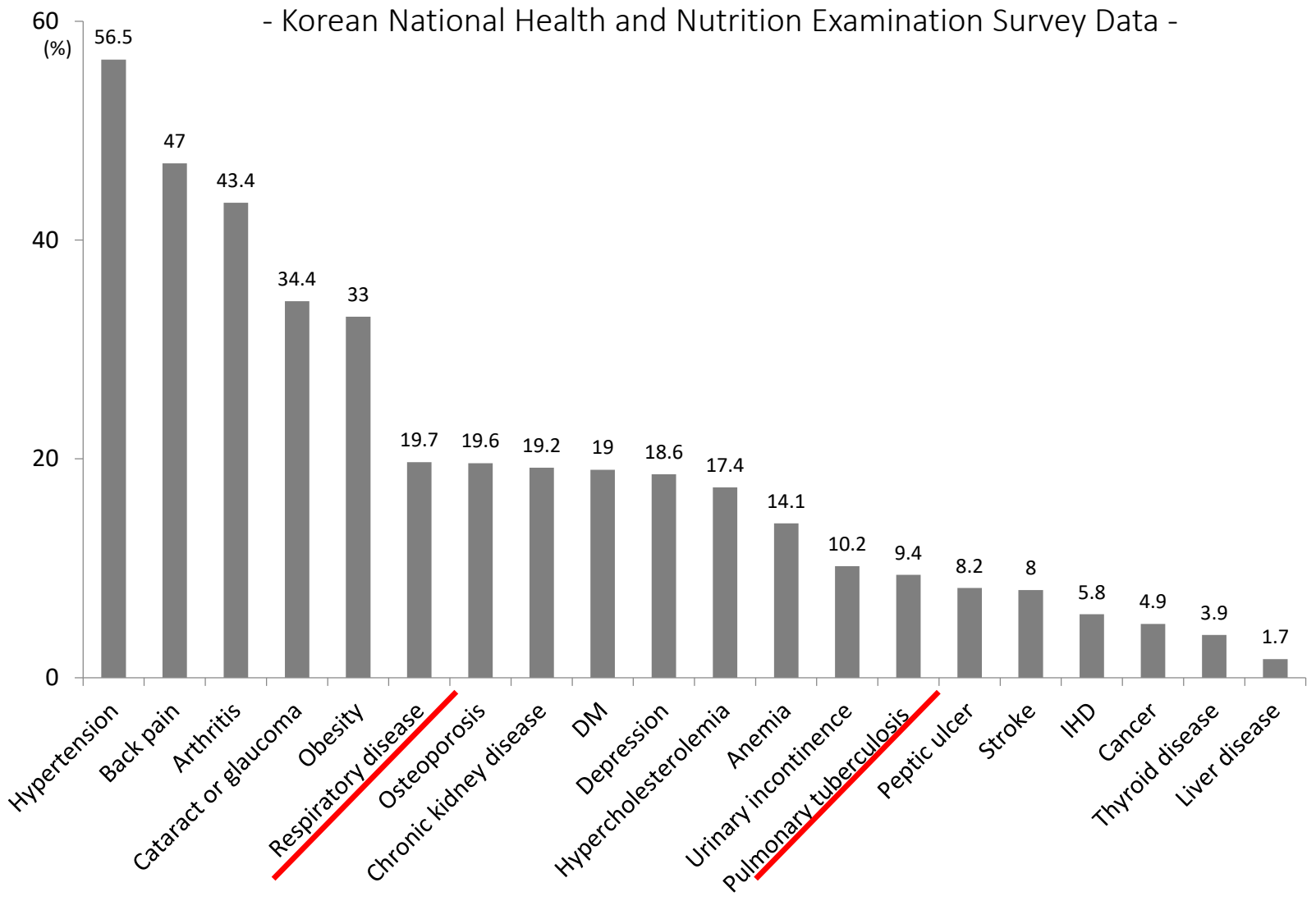
GDP 대비 의료비 상승 전망 : ('12) 101.2조원(7.7%) → ('20) 242.6조원(11.5%)

- '12년 고령자(65세 이상) 건강보험진료비 약 16.4조원 수준(전체 대비 약 34.4% 수준)

연령대별 월평균 1인 진료비 : (국민평균) 8.5만원, (60대) 17.7만원, (70대) 27.2만원, (80대) 37.5만원

- 요양병원 2004년 대비 **10배**, 2008년 대비 **2배** 이상 증가
- 요양병원 진료비 2008년 대비 **4배** 증가

Prevalence of chronic medical conditions in Korean older adults



Kim K, et al, Gender Med 2013 (2008, KNHANES Data)

Leading causes of global age-specific DALYs in 2015

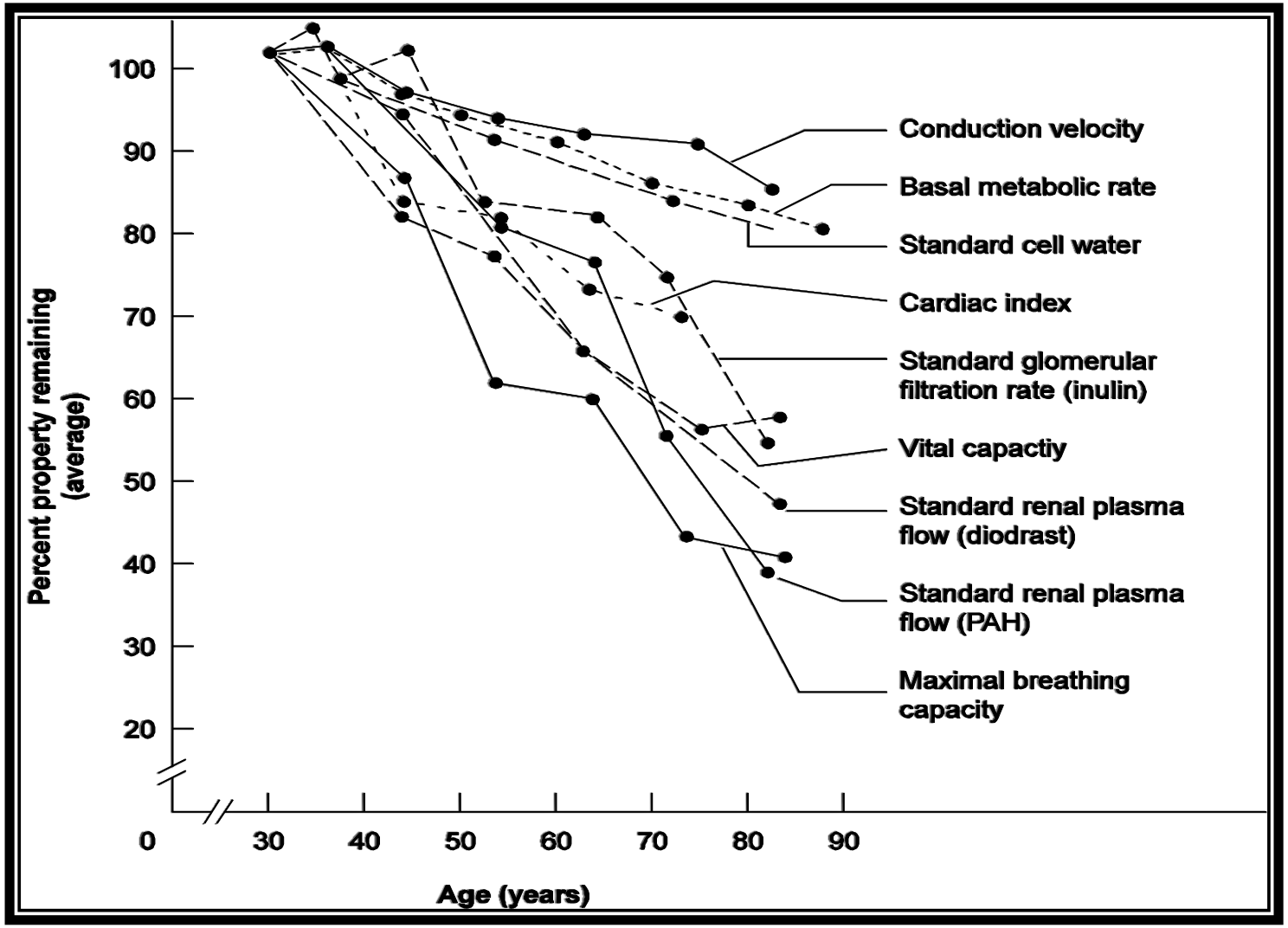
	1	2	3	4	5	6	7	8	9	10
Early neonatal (0–6 days)	NN Preterm	NN Enceph	NN Sepsis	Congenital	Other NN	LRI	NN Haemol	STD	Diarrhoea	Meningitis
Late neonatal (7–27 days)	NN Sepsis	NN Preterm	NN Enceph	Congenital	LRI	Other NN	Diarrhoea	Meningitis	Malaria	NN Haemol
Post-neonatal (28–364 days)	LRI	Diarrhoea	Congenital	Malaria	PEM	Meningitis	HIV	Haemog	Iron	NN Preterm
1–4 years	Malaria	Diarrhoea	LRI	PEM	Iron	Congenital	Meningitis	Drowning	Skin	Haemog
5–9 years	Iron	Skin	LRI	Diarrhoea	Intest inf	Malaria	HIV	Asthma	Road injuries	Congenital
10–14 years	Iron	Skin	HIV	Conduct	Asthma	Road injuries	Anxiety	Intest inf	Migraine	Haemog
15–19 years	Road injuries	Skin	Depression	Iron	Back & neck	Self-harm	Migraine	Anxiety	Violence	HIV
20–24 years	Road injuries	Depression	Self-harm	Back & neck	Skin	Violence	HIV	Migraine	Iron	Other MSK
25–29 years	Road injuries	HIV	Back & neck	Depression	Self-harm	Migraine	Skin	Violence	TB	Drugs
30–34 years	HIV	Back & neck	Road injuries	Depression	Self-harm	Migraine	IHD	TB	Skin	Violence
35–39 years	HIV	Back & neck	Road injuries	Depression	IHD	Migraine	TB	Self-harm	Stroke	Other MSK
40–44 years	Back & neck	HIV	IHD	Road injuries	Depression	Stroke	Diabetes	Sense	TB	Migraine
45–49 years	IHD	Back & neck	Stroke	Diabetes	HIV	Depression	Road injuries	Sense	TB	Other MSK
50–54 years	IHD	Stroke	Back & neck	Diabetes	Sense	Depression	Lung C	COPD	Road injuries	TB
55–59 years	IHD	Stroke	Back & neck	Diabetes	Sense	COPD	Lung C	Depression	TB	CKD
60–64 years	IHD	Stroke	Diabetes	Back & neck	COPD	Sense	Lung C	CKD	LRI	Depression
65–69 years	IHD	Stroke	COPD	Diabetes	Sense	Back & neck	Lung C	CKD	LRI	Stomach C
70–74 years	IHD	Stroke	COPD	Sense	Diabetes	Back & neck	Lung C	LRI	Alzheimer's	CKD
75–79 years	IHD	Stroke	COPD	Sense	Diabetes	Alzheimer's	Back & neck	LRI	Lung C	CKD
≥80 years	IHD	Stroke	Alzheimer's	COPD	Sense	LRI	Diabetes	CKD	Back & neck	HTN HD

Rate of change 2005–15 (%)

−0·56 to −0·31 | −0·31 to −0·19 | −0·19 to −0·09 | −0·09 to −0·04 | −0·04 to 0·01
0·01 to 0·08 | 0·08 to 0·15 | 0·15 to 0·23 | 0·23 to 0·32 | 0·32 to 0·57

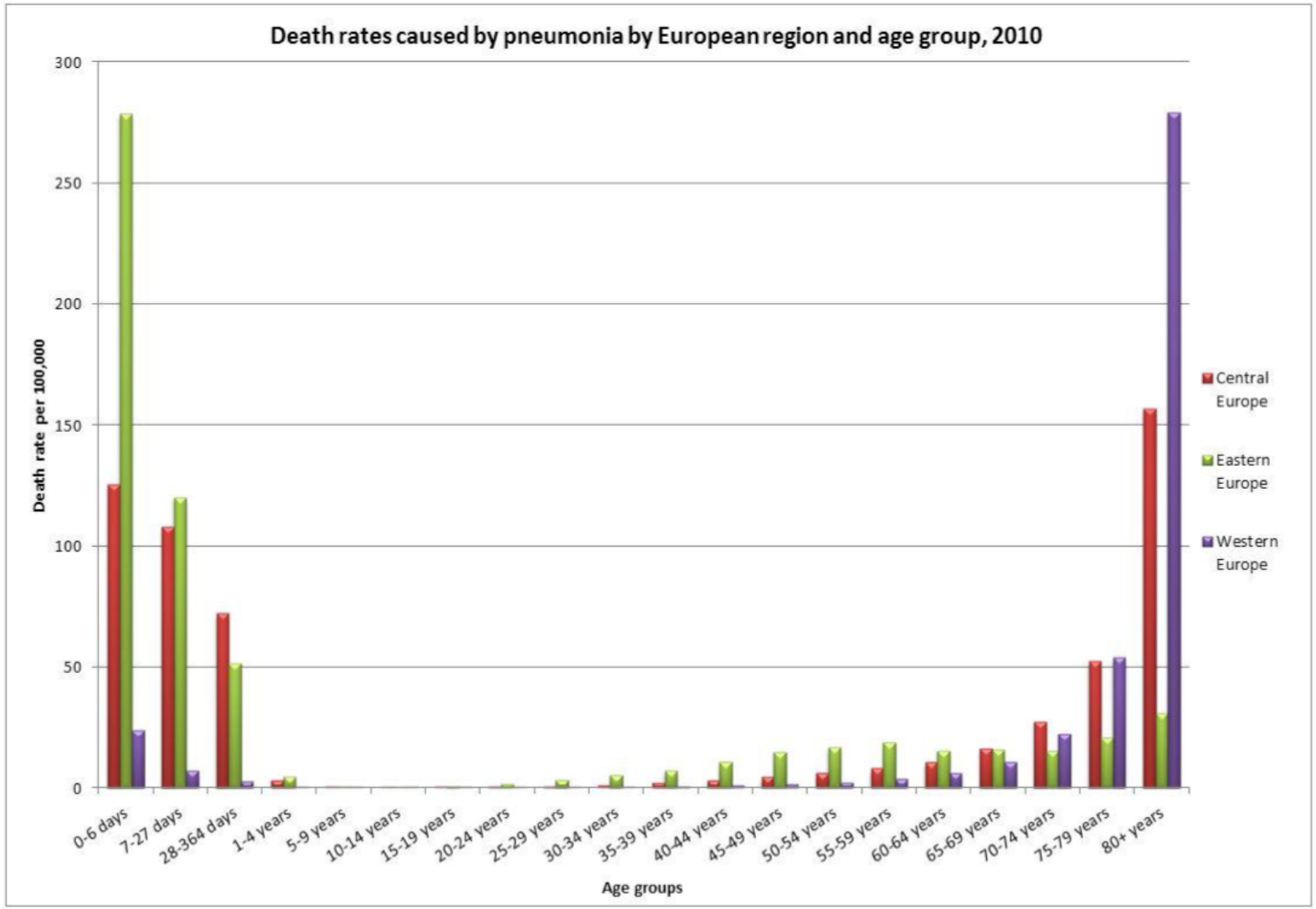
GBD 2015 DALYs and HALE Collaborators, Lancet 2016

Aging in Organ Systems



Source: N.W. Shock, The physiology of aging. *Scientific American*, 1962, 206, 110.

Figure 6.22.1: Death rates caused by pneumonia by European region and age group, 2010



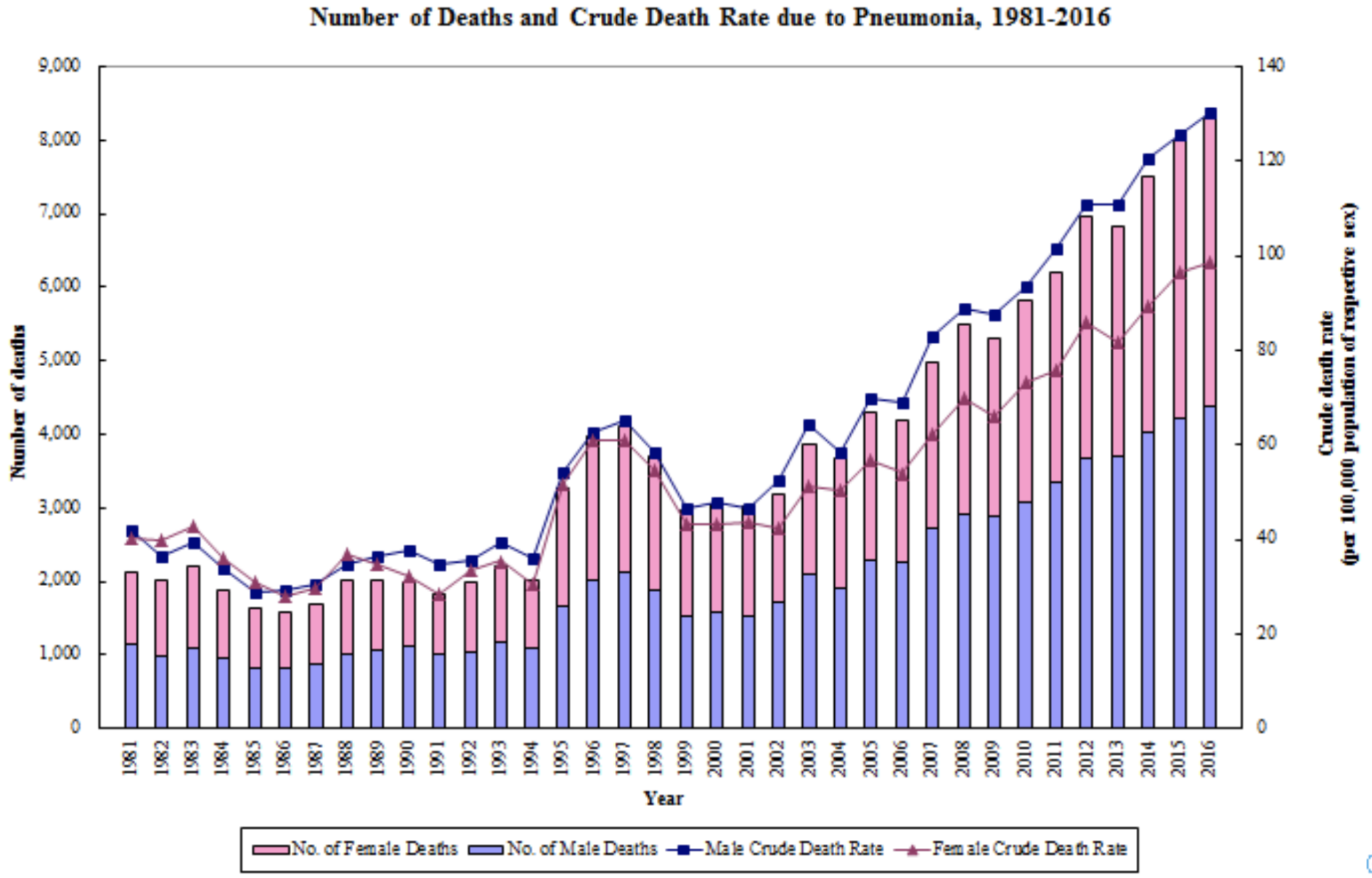
Source: *Institute of Health Metrics and Evaluation (IHME)*, 2013

최근 10년간 폐렴 사망자 수 (10만명당)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
전체	498.4	498.2	497.3	512.0	513.6	530.8	526.6	527.3	541.5	549.4	557.3
신생물	139.1	141.4	142.5	146.6	145.0	149.0	151.5	153.5	153.6	156.0	156.8
- 각종 암	137.5	139.5	140.5	144.4	142.8	146.5	149.0	150.9	150.8	153.0	153.9
* 위암	21.5	20.9	20.4	20.1	19.4	18.6	18.2	17.6	16.7	16.2	15.7
* 간암	22.7	22.9	22.6	22.5	21.8	22.5	22.6	22.8	22.2	21.5	20.9
* 폐암	29.1	29.9	30.0	31.3	31.7	33.1	34.0	34.4	34.1	35.1	35.1
내분비 및 대사성질환	24.3	22.4	21.3	22.3	23.4	24.9	23.4	22.9	22.9	21.6	20.6
- 당뇨병	22.9	20.7	19.6	20.7	21.5	23.0	21.5	20.7	20.7	19.2	17.9
순환기계통의 질환	117.2	112.3	109.2	112.5	113.5	117.1	113.1	113.9	116.9	118.1	119.6
- 고혈압성 질환	11.0	9.6	9.6	9.6	10.1	10.4	9.4	10.0	9.9	10.6	11.3
- 심장 질환	43.7	43.4	45.0	46.9	49.8	52.5	50.2	52.4	55.6	58.2	60.2
- 뇌혈관 질환	59.6	56.5	52.0	53.2	50.7	51.1	50.3	48.2	48.0	45.8	44.4
호흡기계통의 질환	30.3	32.4	34.3	37.1	39.8	45.2	44.5	47.6	54.6	57.5	63.7
- 폐렴	9.3	11.1	12.7	14.9	17.2	20.5	21.4	23.7	28.9	32.2	37.8
- 만성하기도 질환	15.3	14.9	13.9	14.2	13.9	15.6	14.0	14.1	14.8	13.7	13.2
소화기계통의 질환	21.9	21.8	21.5	22.2	22.2	22.4	22.1	22.4	23.0	23.4	23.7
- 간 질환	14.9	14.5	13.8	13.8	13.5	13.5	13.2	13.1	13.4	13.3	13.3
사망의 외부요인	61.3	61.7	65.8	65.4	64.7	61.9	61.3	57.8	56.5	55.2	53.0
- 운수사고	15.5	14.7	14.4	13.7	12.6	12.9	11.9	11.2	10.9	10.1	9.8
- 자살	24.8	26.0	31.0	31.2	31.7	28.1	28.5	27.3	26.5	25.6	24.3

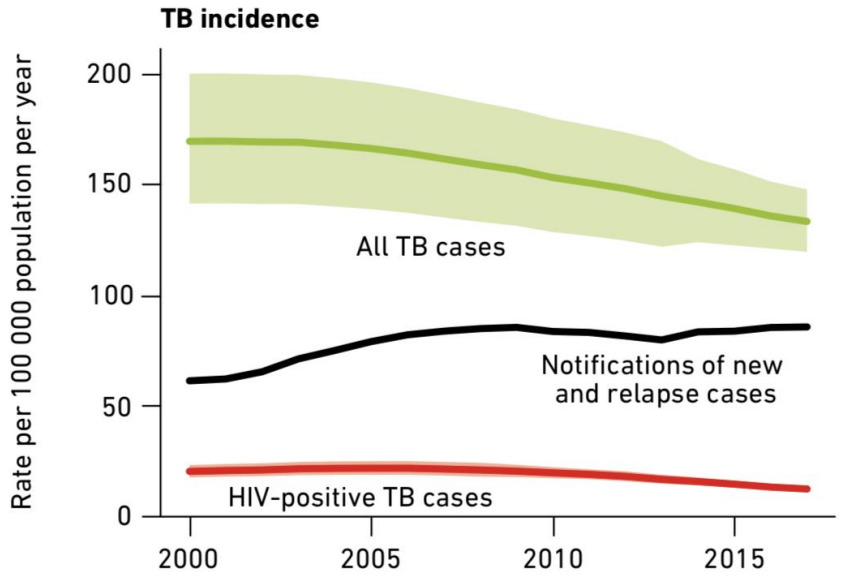

최근 10년간 폐렴 사망자 수
(단위:명) 자료:통계청
4,556
5,461
6,324
7,432
8,606
10,314
10,809
12,021
14,718
16,476
2007년
2008년
2009년
2010년
2011년
2012년
2013년
2014년
2015년
2016년

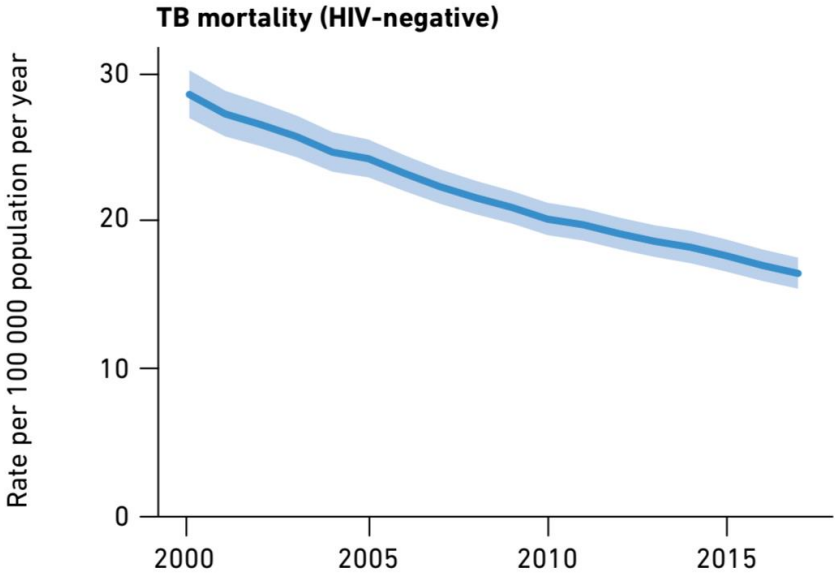
폐렴사망율, 홍콩


Number of Deaths and Crude Death Rate due to Pneumonia, 1981-2016
Number of deaths
Crude death rate (per 100,000 population of respective sex)
Year
No. of Female Deaths
No. of Male Deaths
Male Crude Death Rate
Female Crude Death Rate

TB

INCIDENCE AND MORTALITY





우리나라 결핵환자 및 신(新)환자 현황(2011년~2017년) (단위: 명)

연도	2011년	2012년	2013년	2014년	2015년	2016년	2017년
결핵환자	50,491	49,532	45,292	43,088	40,847	39,245	36,044
결핵 신환자	39,557	39,545	36,089	34,869	32,181	30,892	28,161

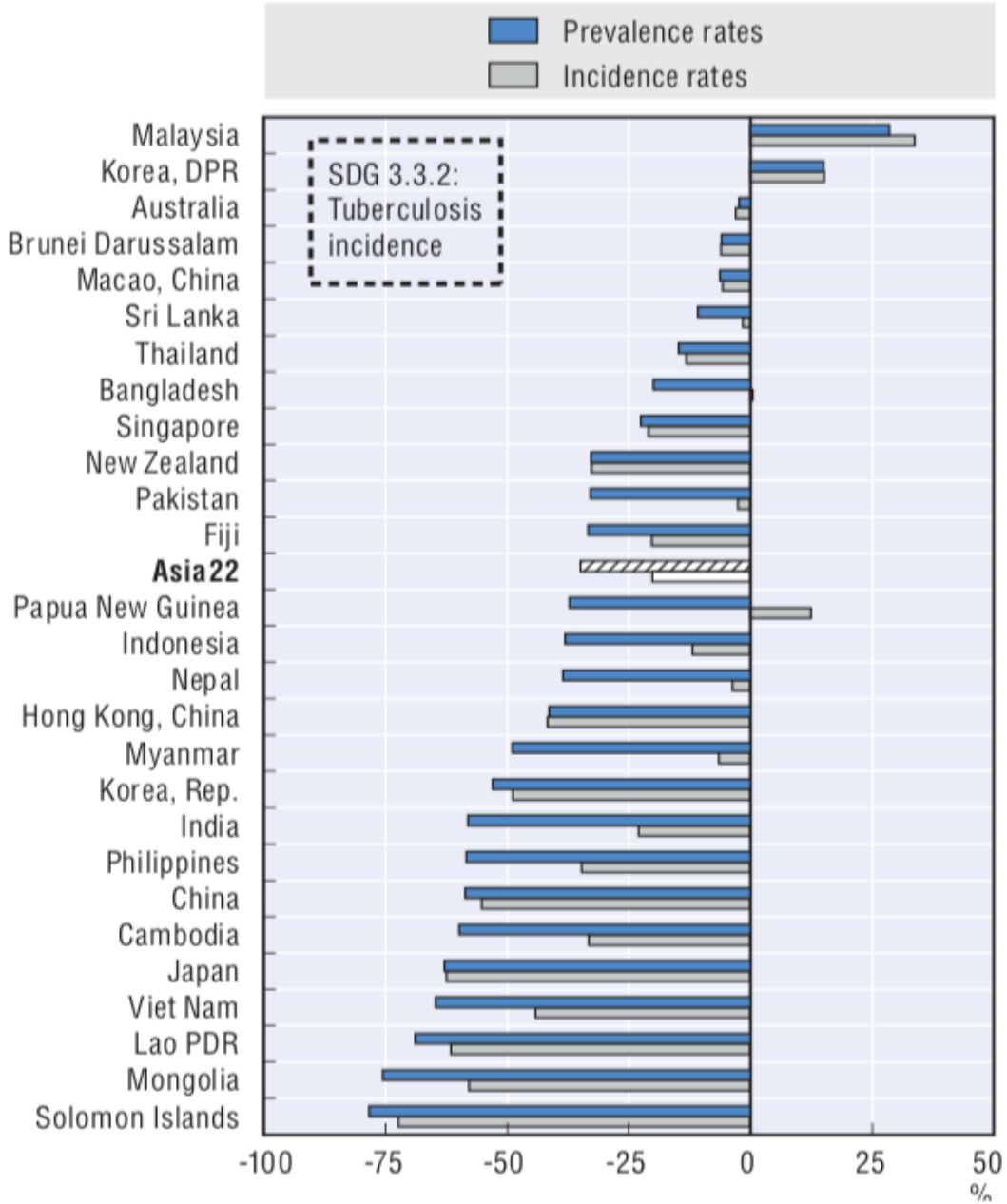
자료원 : 2017년 결핵환자 신고현황(질병관리본부, 2018)

연도별 결핵 사망자수(2009년~2016년)

연도	2009년	2010년	2011년	2012년	2013년	2014년	2015년	2016년
결핵 사망자수	2,292	2,365	2,364	2,466	2,230	2,305	2,209	2,186

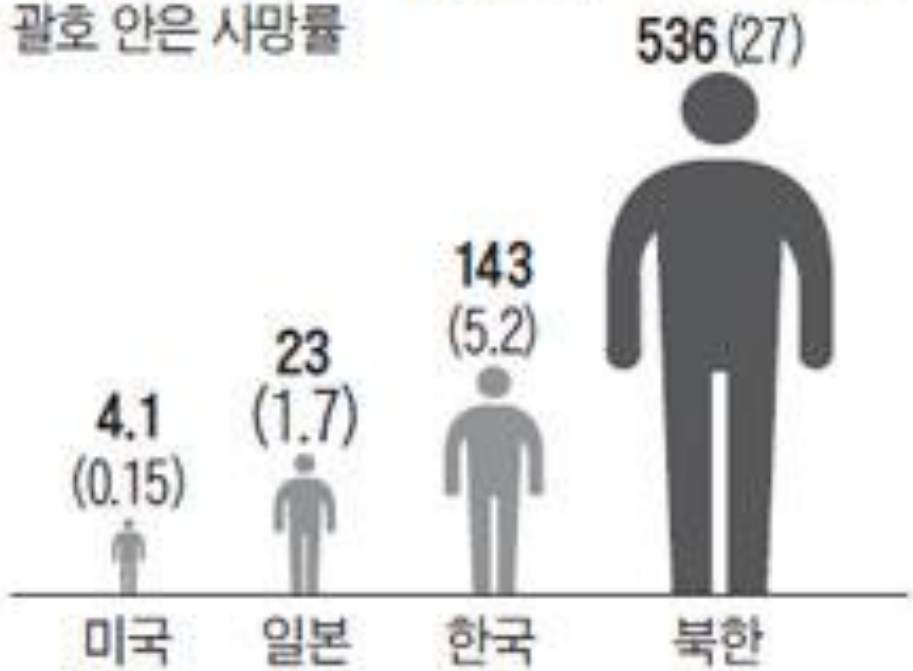
자료원 : 2017년 결핵환자 신고현황(질병관리본부, 2018)

1.25. Change in tuberculosis incidence and prevalence rate, 1990-2014



국가별 결핵 환자 수 단위: 인구 10만명당

괄호 안은 사망률



자료: 세계보건기구(WHO) 2014년 결핵 보고서

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

World Health Organization
WHO GLOBAL TB REPORT 2018

POPULATION: 25 MILLION

2017

131 000 FELL ILL WITH TB

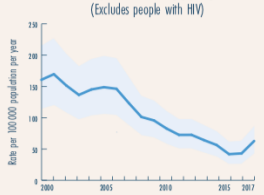
81 000 males
50 000 females
15 000 children

100 553 TB cases notified
30 447 people not notified or not diagnosed

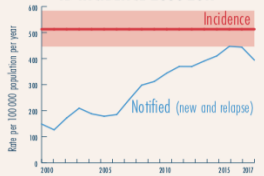
16 000 TB DEATHS

including **44 deaths** among **people with HIV**

TB MORTALITY 2000-2017
(Excludes people with HIV)



TB INCIDENCE 2000-2017



TREATMENT

TB treatment coverage
77%

2025
90% End TB operational targets

Treatment success rate
not reported

DRUG-RESISTANT TB

5 200 people fell ill with drug-resistant TB

1 515 notified

1 732 notified and started on treatment

TB/HIV

170 people living with HIV fell ill with TB

Not reported notified

–

–

Not reported notified and on antiretroviral treatment

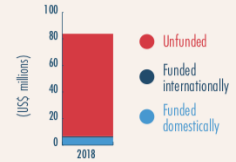
TB PREVENTIVE TREATMENT

Not reported
HIV-positive people (newly enrolled in care) on TB preventive treatment

100%
Children (aged <5 years) household contacts of bacteriologically-confirmed TB cases on TB preventive treatment

TB FINANCING 2018

National TB budget USD **84 million**

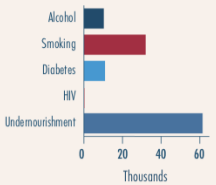


TB-SDG MONITORING FRAMEWORK

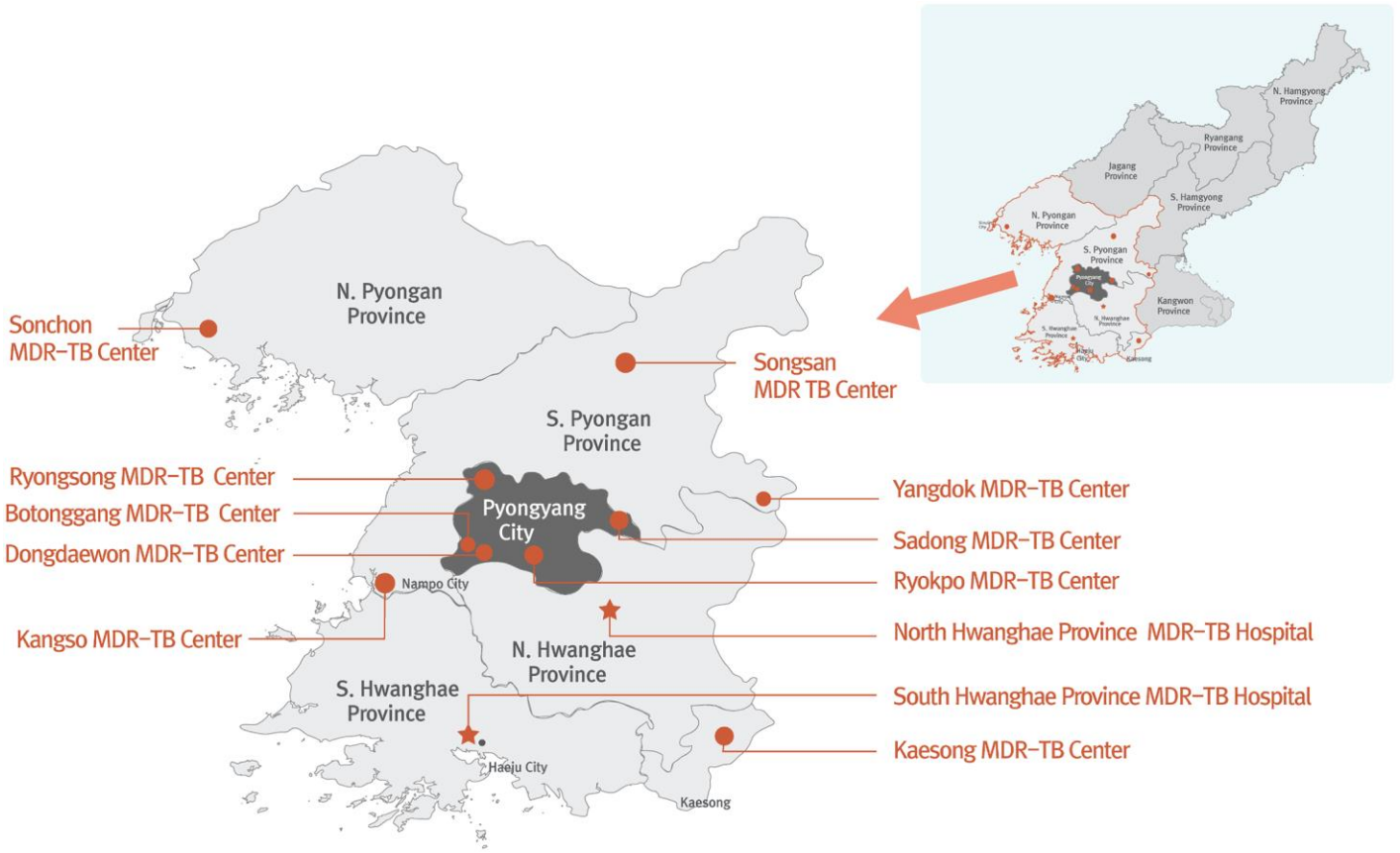
Out-of-pocket health expenditure (% of current health expenditure)	HIV prevalence (% of population aged 15–49 years)	Smoking prevalence (% of population aged ≥15 years)	Diabetes prevalence (% of population aged ≥18 years)	Alcohol use disorders, 12 month prevalence (% of population aged ≥15 years)
–	–	–	5.8% (M) 5.9% (F)	5.1% (M) 0.9% (F)

Monitoring of the above indicators can be used to identify key influences on the TB epidemic at national level and inform the multisectoral actions required to end the TB epidemic.

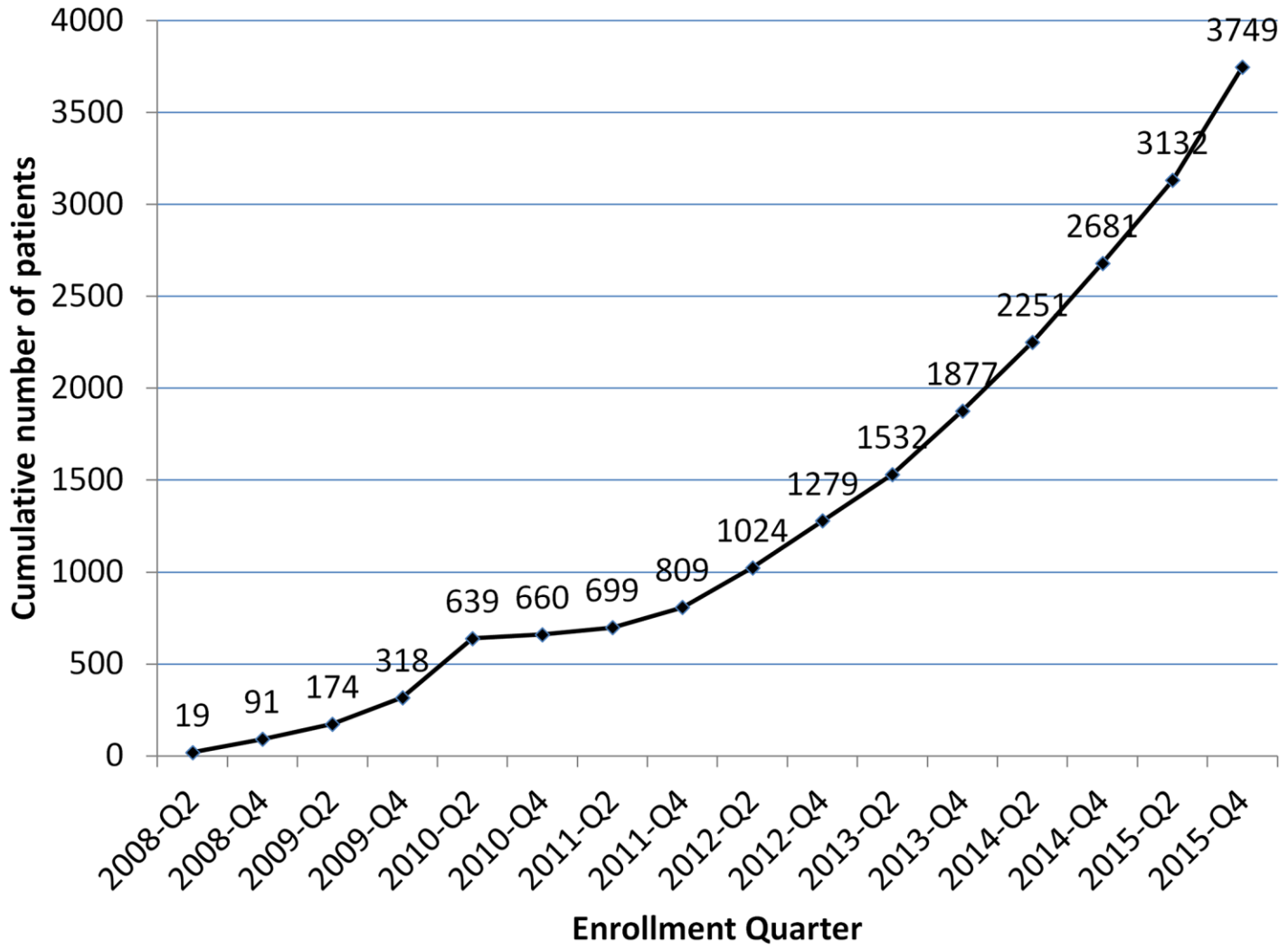
Number of TB cases attributable to 5 risk factors



MDR TB centers supported by Eugene Bell Foundation

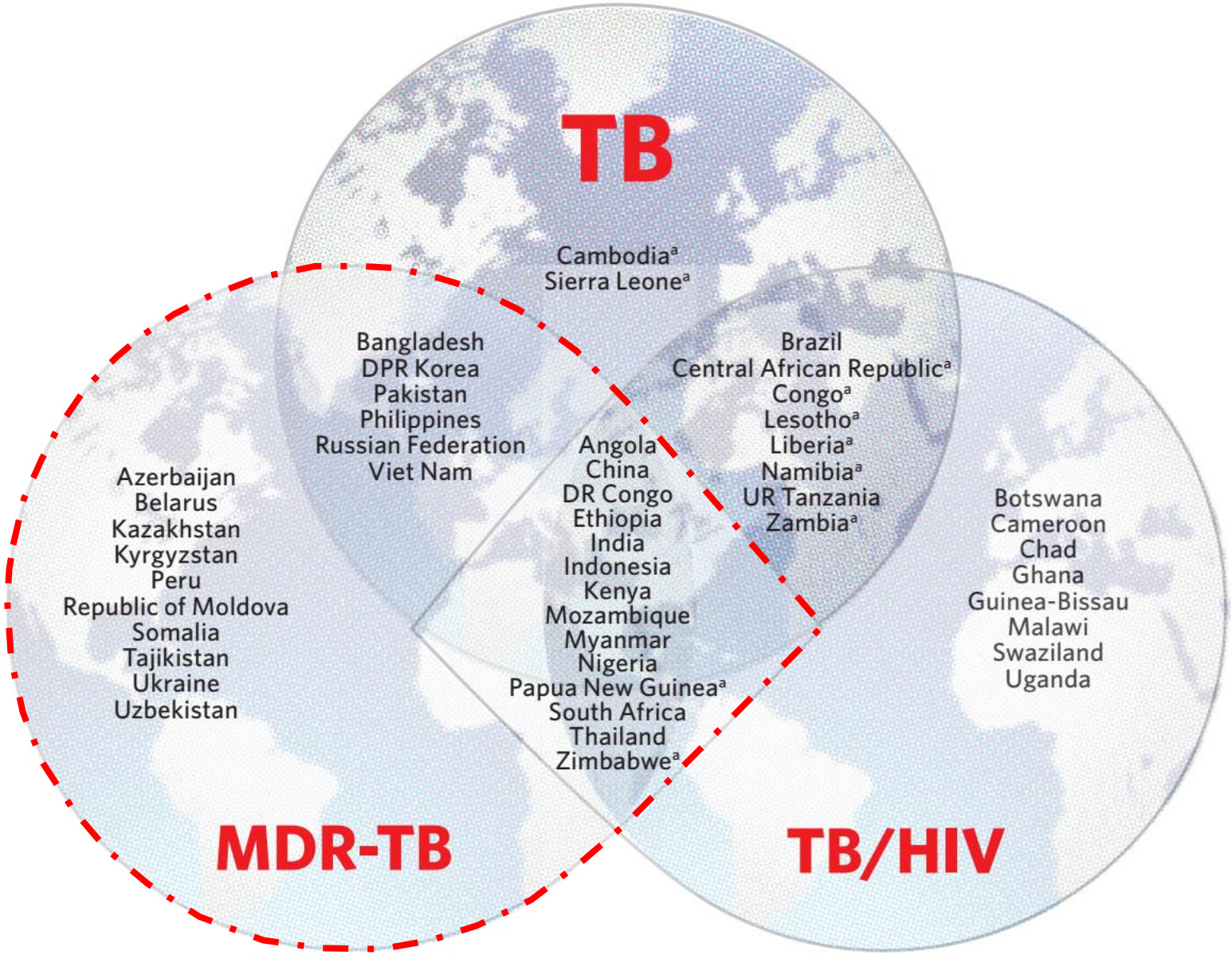


Seung et al. Plos One 2016

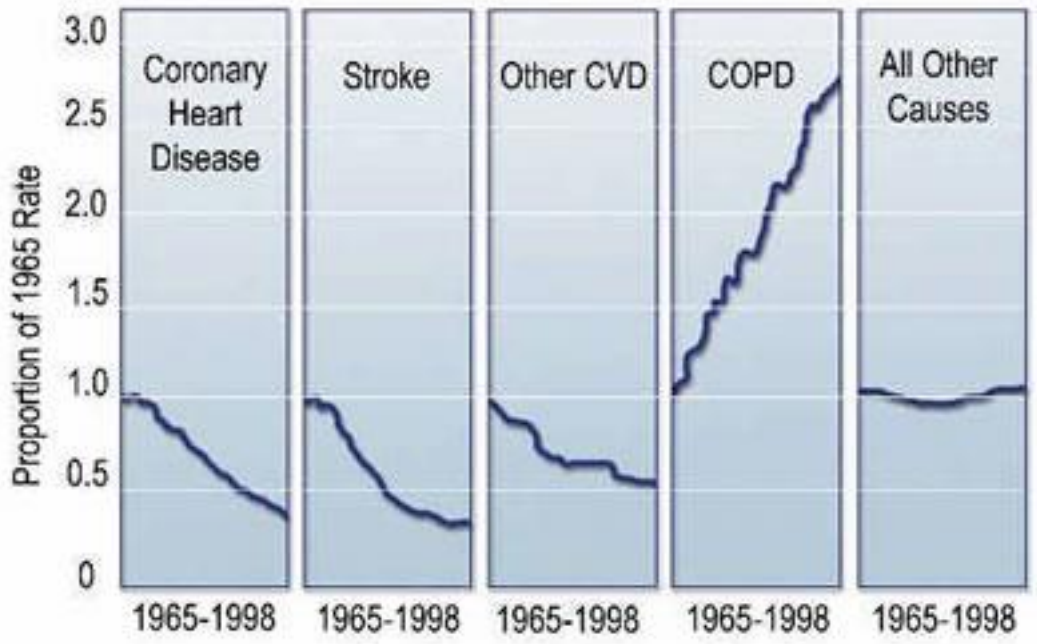


Seung et al. Plos One 2016

30 high MDR-TB burden countries

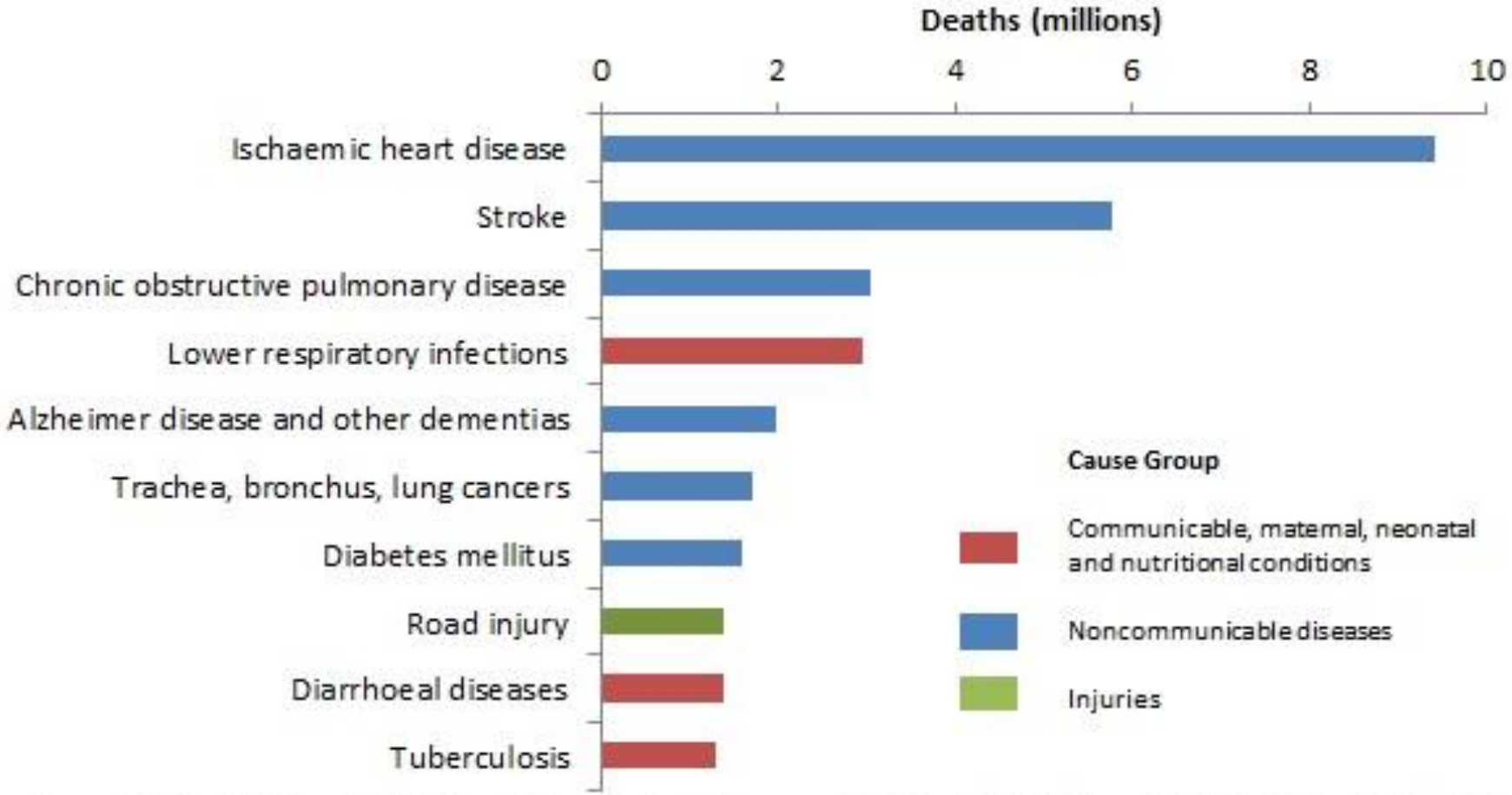


US COPD mortality, 1965-1998

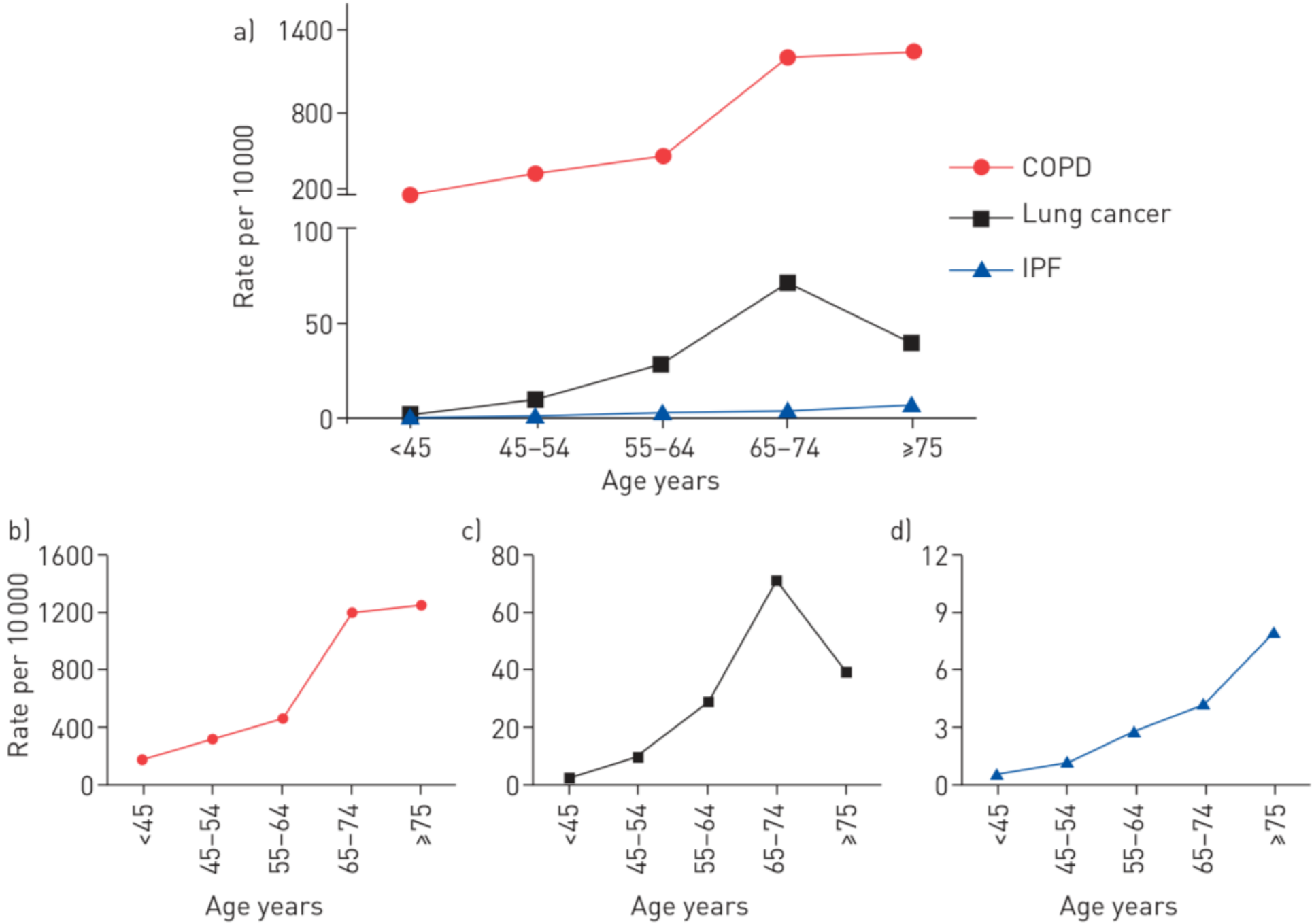


Percent change in age-adjusted mortality rates of chronic obstructive pulmonary disease in comparison with coronary heart disease, stroke, other cardiovascular disease and all other causes between 1965 and 1998 in the United States.

Top 10 global causes of deaths, 2016

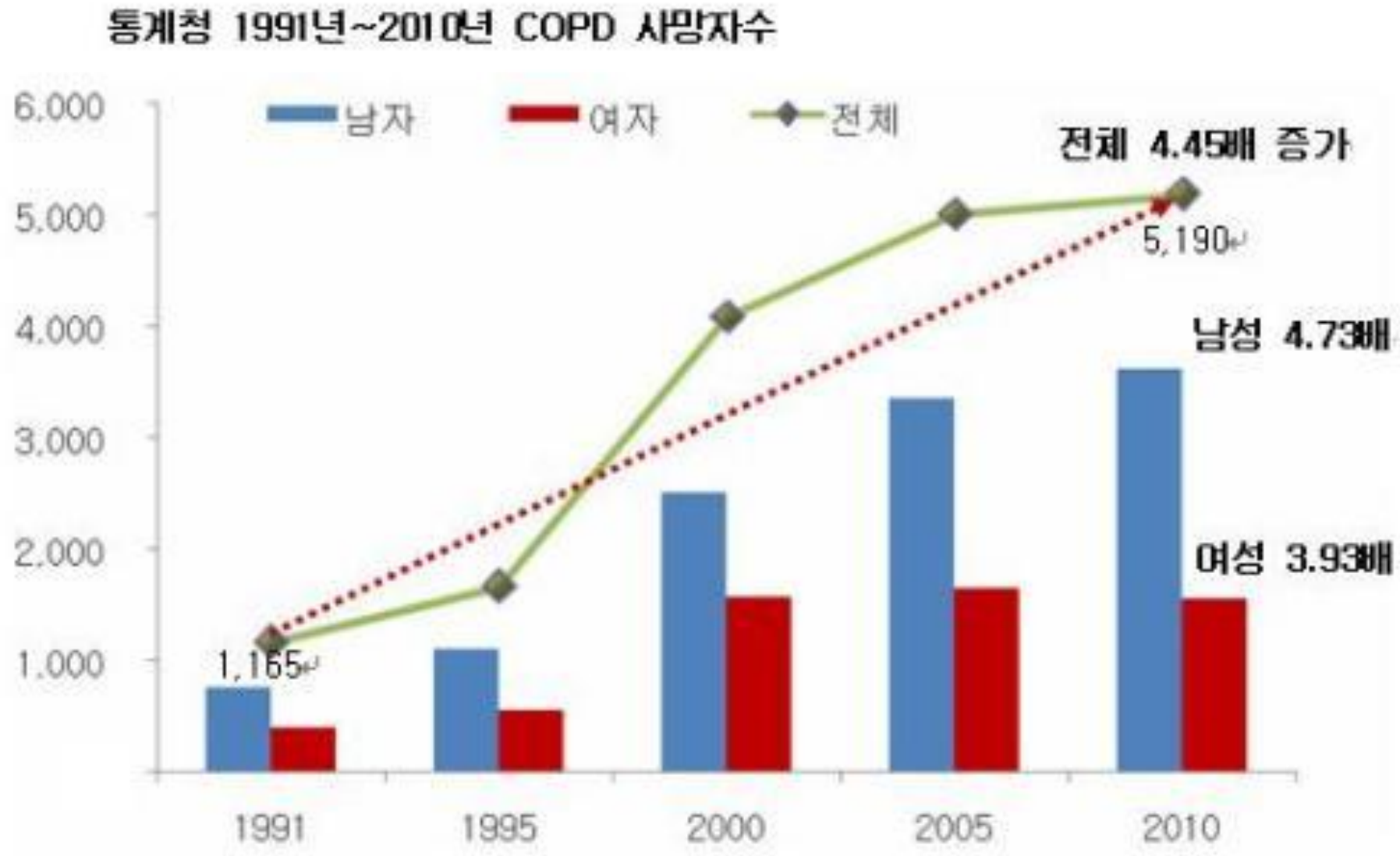


Source: Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2016. Geneva, World Health Organization; 2018.

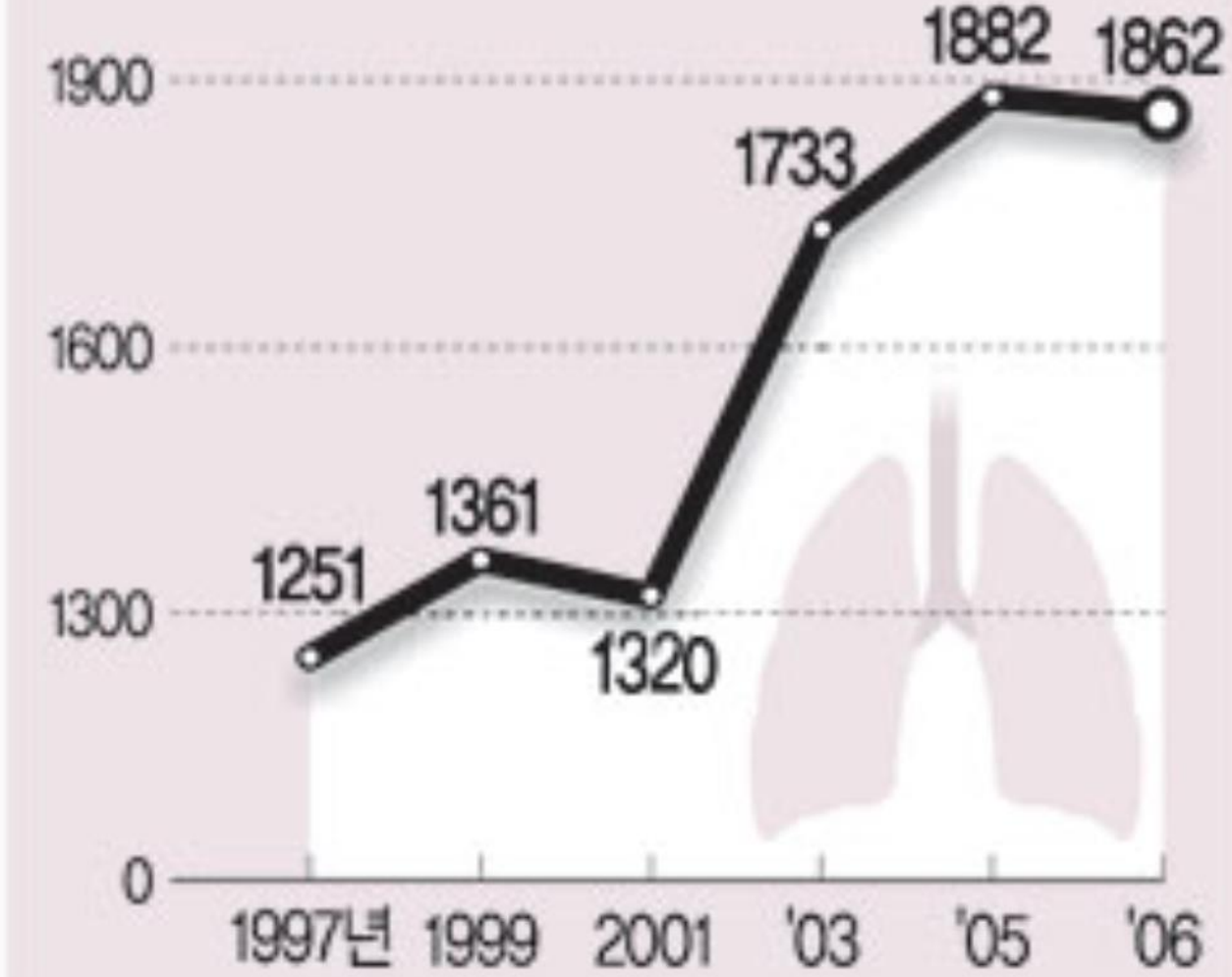

a)
Rate per 10 000
1400
800
200
100
50
0
<45
45–54
55–64
65–74
≥75
Age years
COPD
Lung cancer
IPF
b)
Rate per 10 000
1600
1200
800
400
0
<45
45–54
55–64
65–74
≥75
Age years
c)
80
60
40
20
0
<45
45–54
55–64
65–74
≥75
Age years
d)
12
9
6
3
0
<45
45–54
55–64
65–74
≥75
Age years

최근 10년간 COPD 사망자 수 (10만명당)

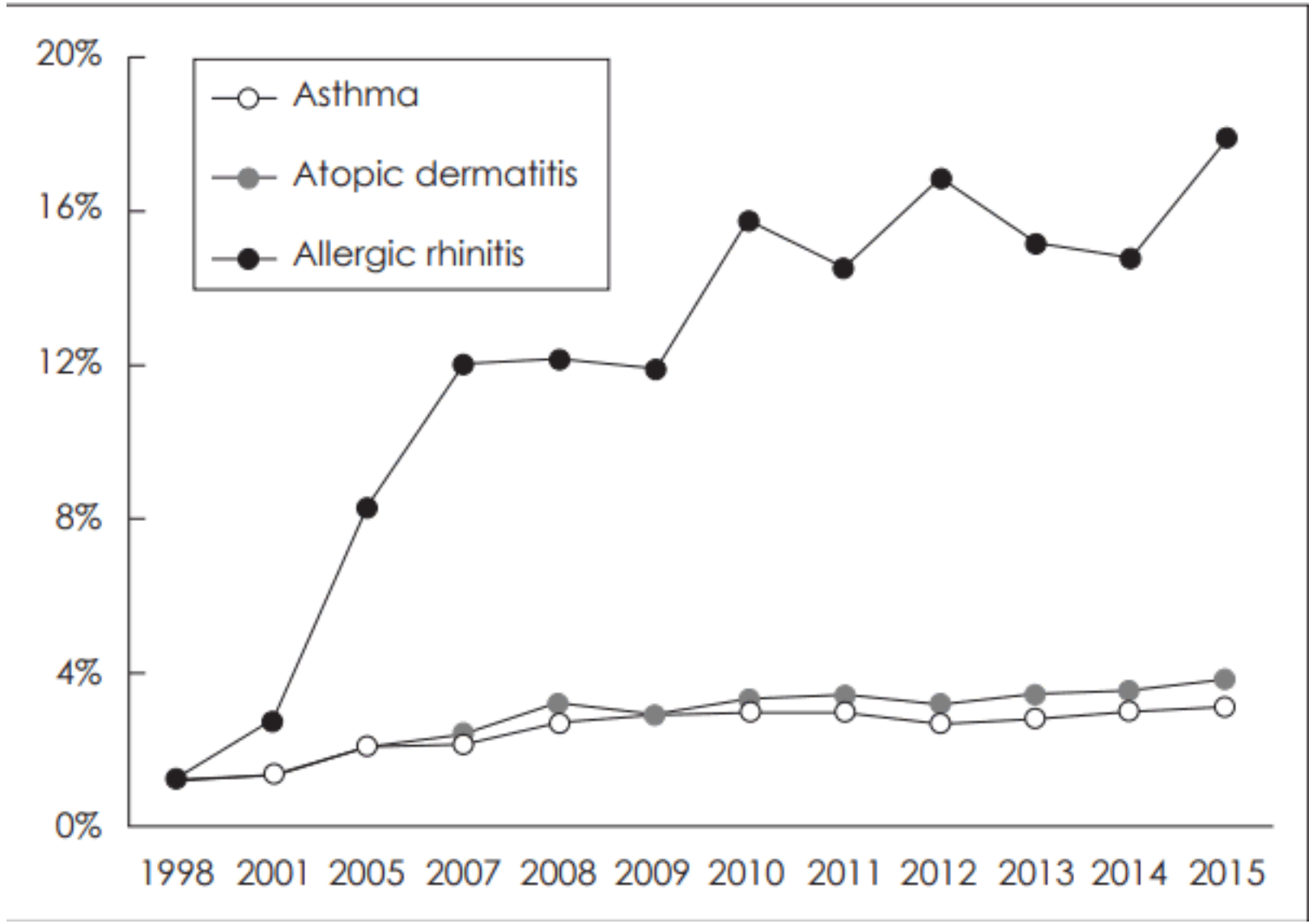
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
전체	498.4	498.2	497.3	512.0	513.6	530.8	526.6	527.3	541.5	549.4	557.3
신생물	139.1	141.4	142.5	146.6	145.0	149.0	151.5	153.5	153.6	156.0	156.8
- 각종 암	137.5	139.5	140.5	144.4	142.8	146.5	149.0	150.9	150.8	153.0	153.9
* 위암	21.5	20.9	20.4	20.1	19.4	18.6	18.2	17.6	16.7	16.2	15.7
* 간암	22.7	22.9	22.6	22.5	21.8	22.5	22.6	22.8	22.2	21.5	20.9
* 폐암	29.1	29.9	30.0	31.3	31.7	33.1	34.0	34.4	34.1	35.1	35.1
내분비 및 대사성질환	24.3	22.4	21.3	22.3	23.4	24.9	23.4	22.9	22.9	21.6	20.6
- 당뇨병	22.9	20.7	19.6	20.7	21.5	23.0	21.5	20.7	20.7	19.2	17.9
순환기계통의 질환	117.2	112.3	109.2	112.5	113.5	117.1	113.1	113.9	116.9	118.1	119.6
- 고혈압성 질환	11.0	9.6	9.6	9.6	10.1	10.4	9.4	10.0	9.9	10.6	11.3
- 심장 질환	43.7	43.4	45.0	46.9	49.8	52.5	50.2	52.4	55.6	58.2	60.2
- 뇌혈관 질환	59.6	56.5	52.0	53.2	50.7	51.1	50.3	48.2	48.0	45.8	44.4
호흡기계통의 질환	30.3	32.4	34.3	37.1	39.8	45.2	44.5	47.6	54.6	57.5	63.7
- 폐렴	9.3	11.1	12.7	14.9	17.2	20.5	21.4	23.7	28.9	32.2	37.8
- 만성하기도 질환	15.3	14.9	13.9	14.2	13.9	15.6	14.0	14.1	14.8	13.7	13.2
소화기계통의 질환	21.9	21.8	21.5	22.2	22.2	22.4	22.1	22.4	23.0	23.4	23.7
- 간 질환	14.9	14.5	13.8	13.8	13.5	13.5	13.2	13.1	13.4	13.3	13.3
사망의 외부요인	61.3	61.7	65.8	65.4	64.7	61.9	61.3	57.8	56.5	55.2	53.0
- 운수사고	15.5	14.7	14.4	13.7	12.6	12.9	11.9	11.2	10.9	10.1	9.8
- 자살	24.8	26.0	31.0	31.2	31.7	28.1	28.5	27.3	26.5	25.6	24.3


통계청 1991년~2010년 COPD 사망자수
6,000
5,000
4,000
3,000
2,000
1,000
남자
여자
전체
전체 4.45배 증가
5,190
남성 4.73배
여성 3.93배
1,165
1991
1995
2000
2005
2010

국내 COPD 입원 환자 증가 추이(단위 : 명)

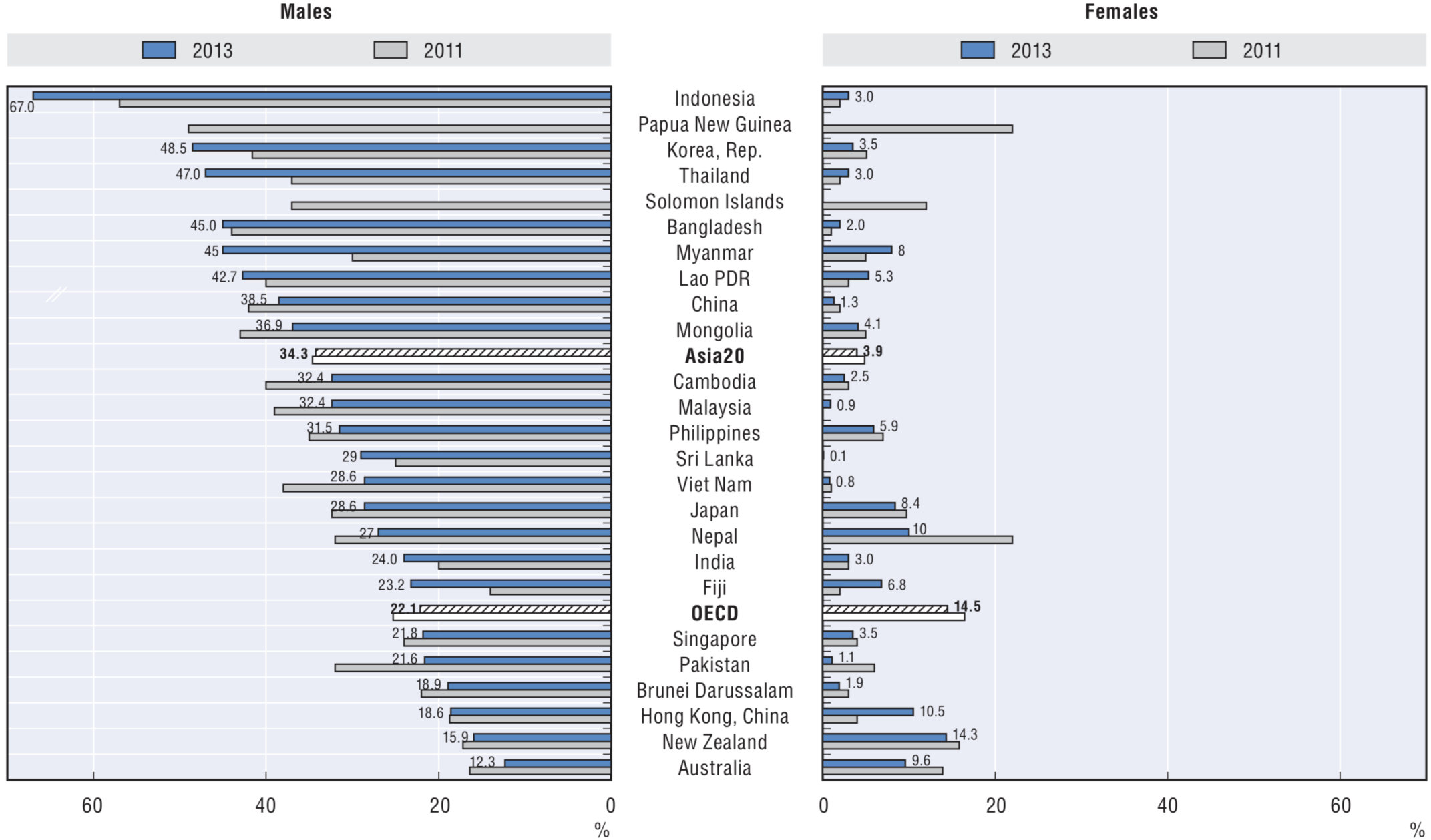


자료 : 대한결핵 및 호흡기 학회



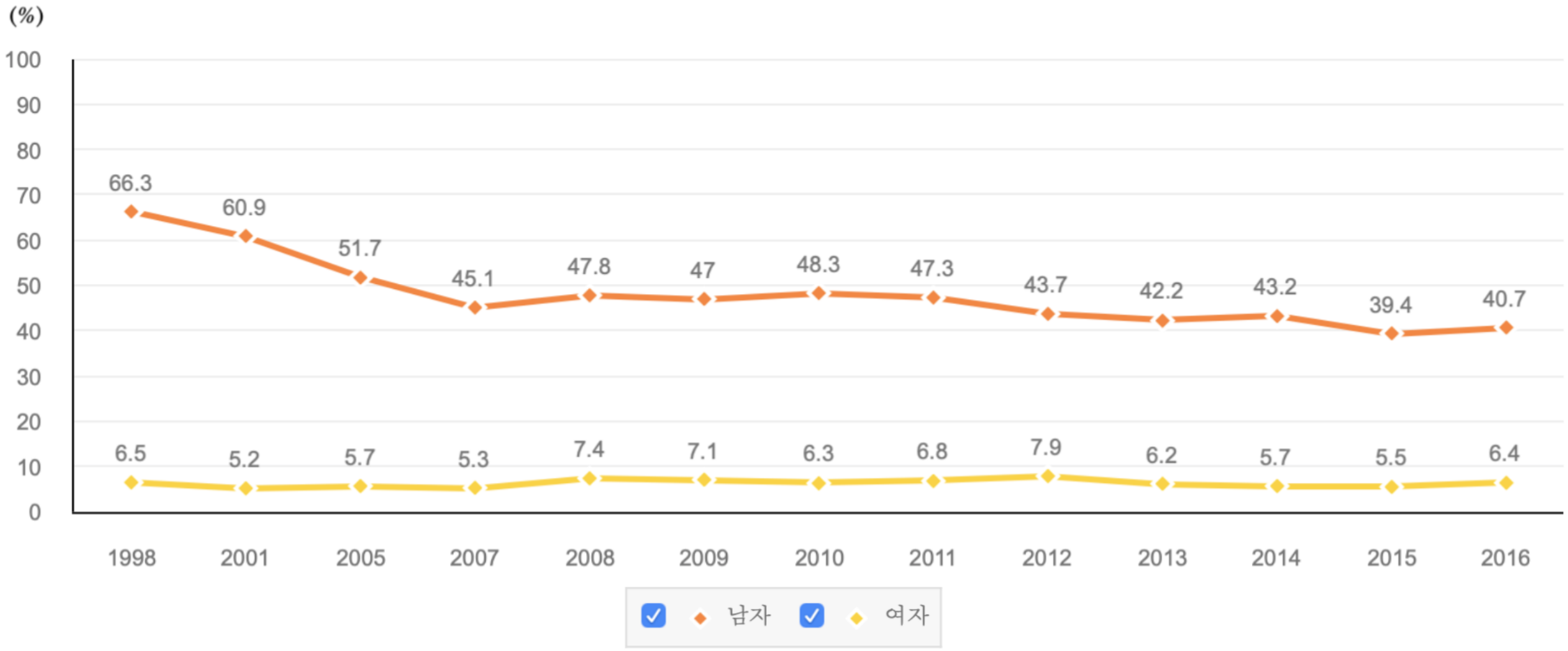
KHANES 2010-2012.

2.18. Adults smoking daily, 2011-13

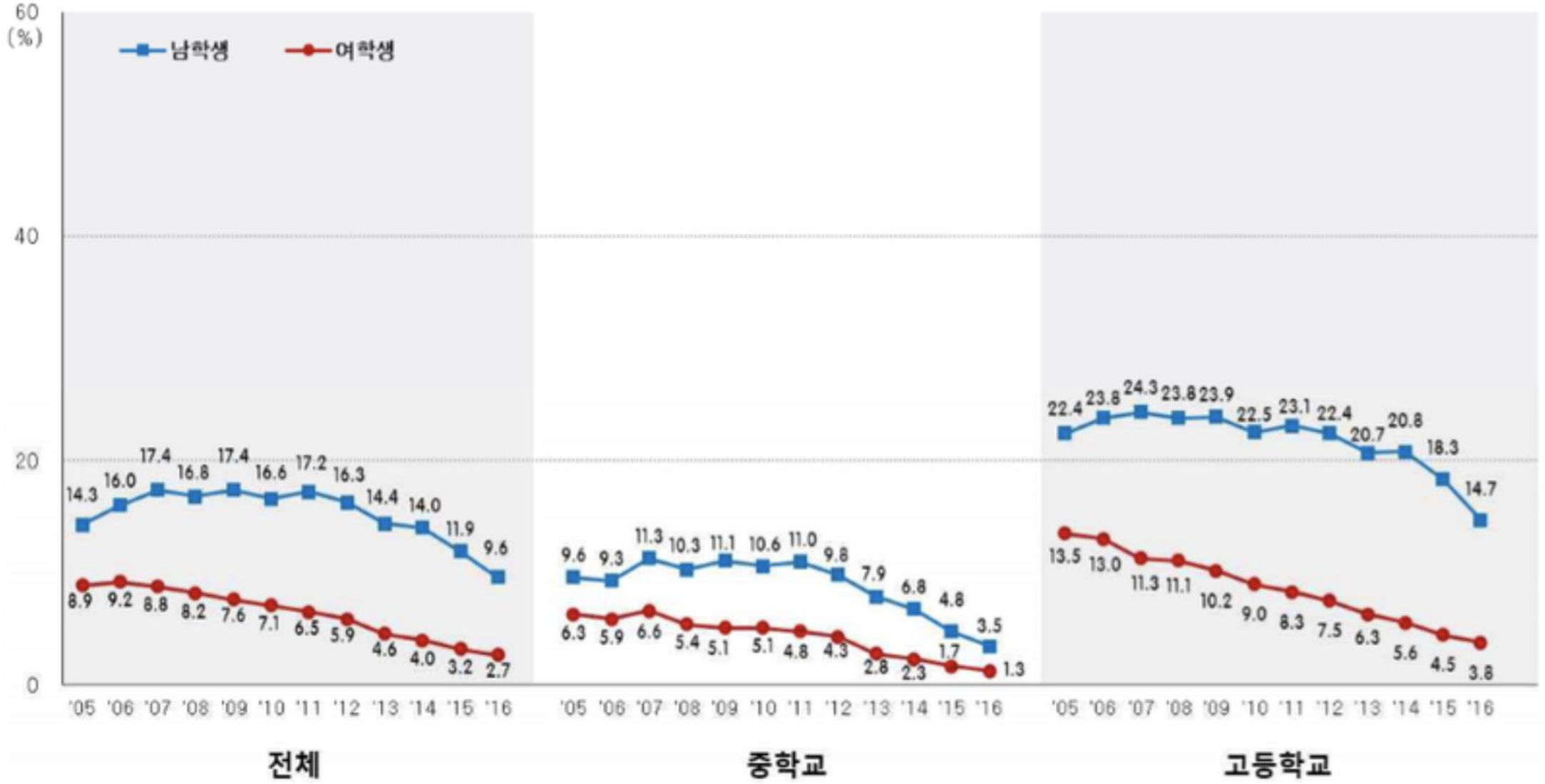


Source: *OECD Health Statistics 2016*; WHO (2016e); Thematic Household Survey, Hong Kong, China, 2012.

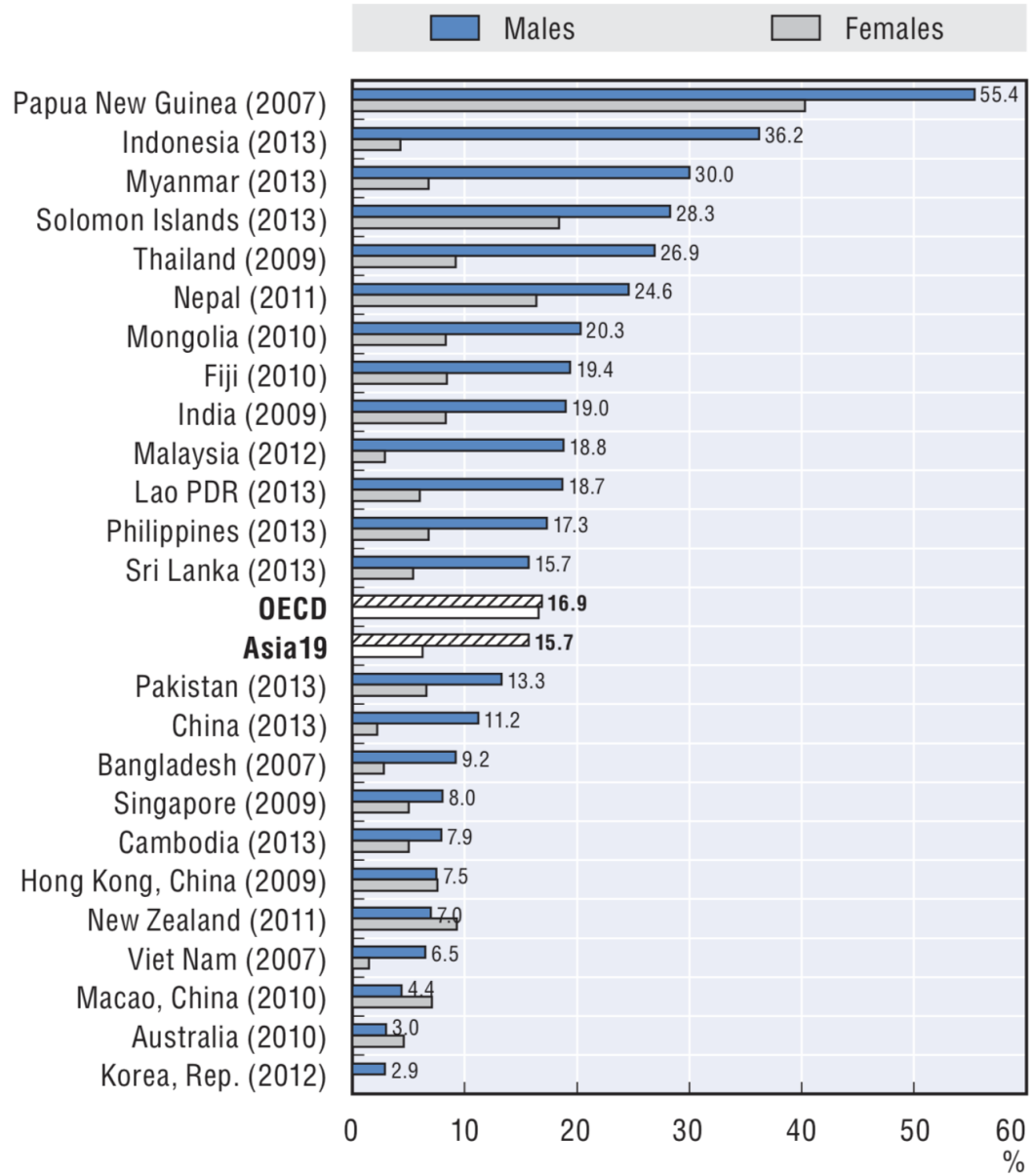
흡연율, 1998-2016



청소년흡연율


60
(%)
40
20
0
남학생
여학생
14.3 16.0 17.4 16.8 17.4 16.6 17.2 16.3 14.4 14.0 11.9 9.6
8.9 9.2 8.8 8.2 7.6 7.1 6.5 5.9 4.6 4.0 3.2 2.7
9.6 9.3 11.3 10.3 11.1 10.6 11.0 9.8 7.9 6.8 4.8 3.5
6.3 5.9 6.6 5.4 5.1 5.1 4.8 4.3 2.8 2.3 1.7 1.3
22.4 23.8 24.3 23.8 23.9 22.5 23.1 22.4 20.7 20.8 18.3 14.7
13.5 13.0 11.3 11.1 10.2 9.0 8.3 7.5 6.3 5.6 4.5 3.8
'05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16
전체
중학교
고등학교

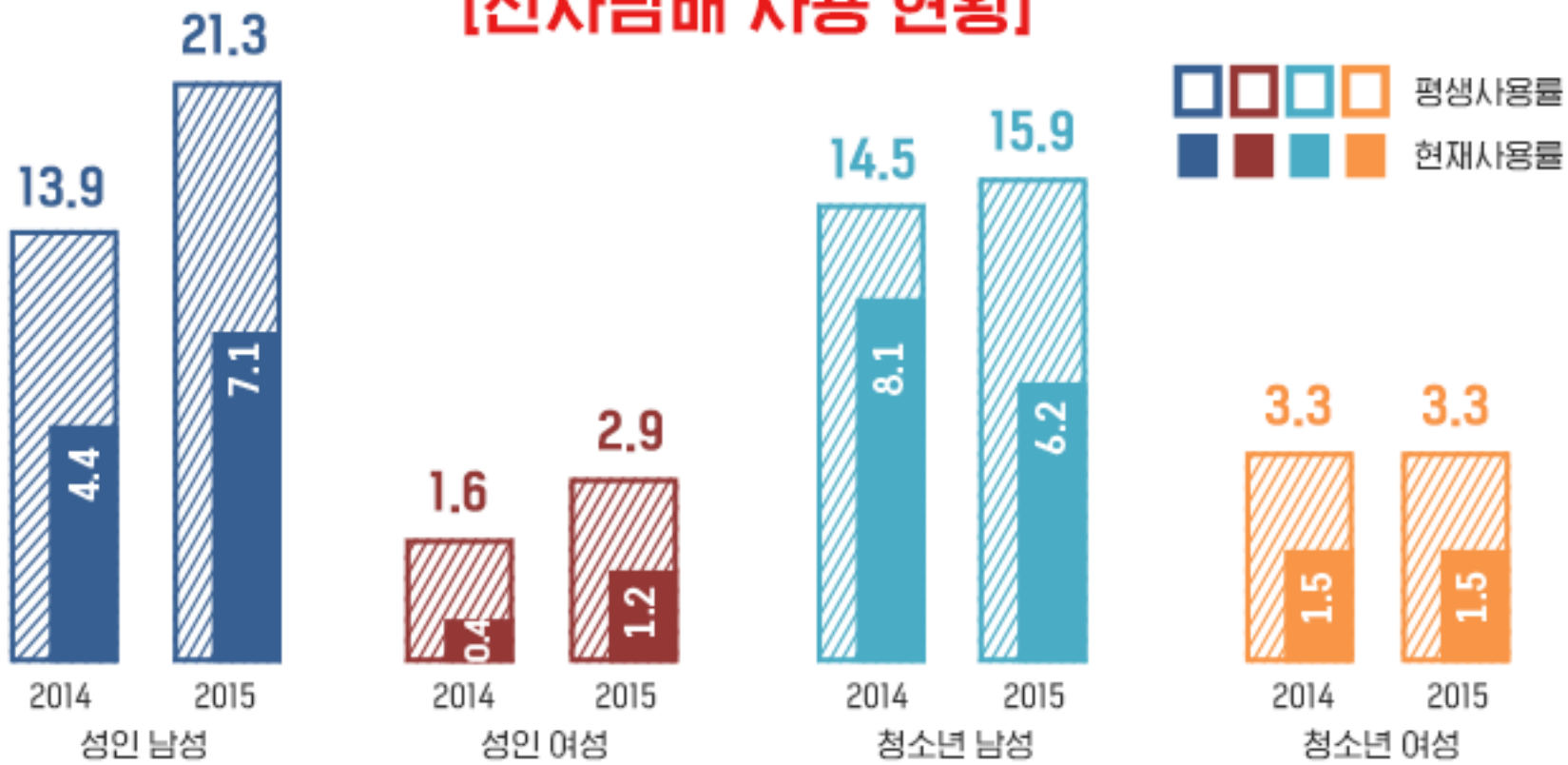
2.19. Current tobacco use among youth aged 13-15 years, 2013 (or nearest year)



Source: WHO (2016e); GYTS, Hong Kong, China, 2010; GYTS, Macao, China, 2010; GSHS, Solomon Islands, 2011.

보건복지부

[전자담배 사용 현황]



· 전자담배 평생사용률 : 지금까지 전자담배를 사용한 적이 있는 분율 · 전자담배 현재사용률 : 최근 한 달 동안 전자담배를 사용한 적이 있는 분율

요약 및 결론

- 급격한 고령화는 호흡기질환과 밀접한 관련
- 폐렴의 사망자 수 증가
- 결핵은 완만히 감소하는 추세
- 북한의 결핵은 증가
- 천식과 COPD 유병율 증가
- 흡연율(특히 청소년)은 감소 추세
- 전자담배의 사용율 증가