Upsurge of Breast Cancer in Young Asian Women: Trend and Its Determinants
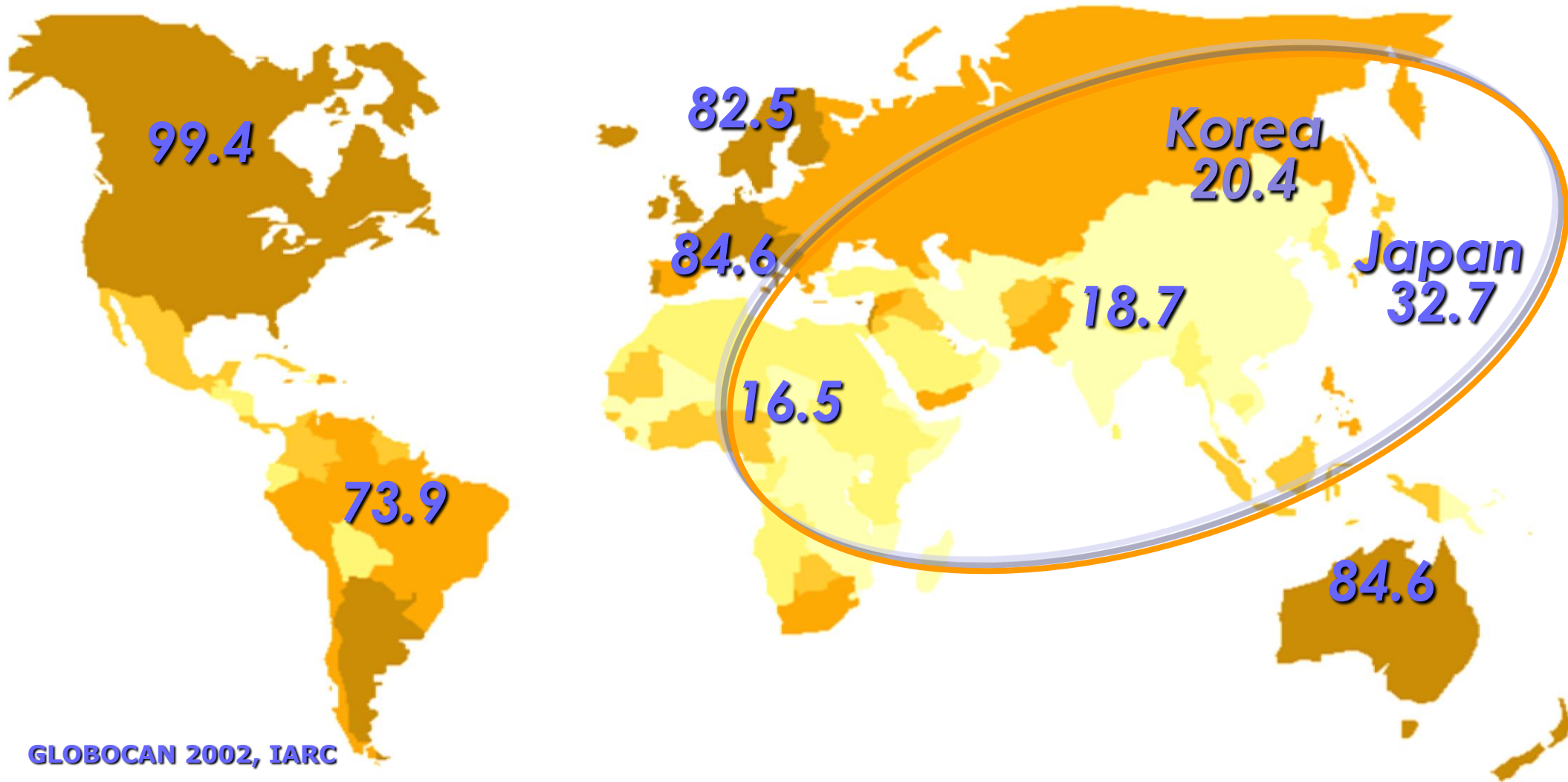
Seoul National University College of Medicine
Asian Pacific Organization for Cancer Prevention

Keun-Young Yoo

+82-2-740-8324
 kyyoo@snu.ac.kr

Global Distribution of Breast Cancer (2002)
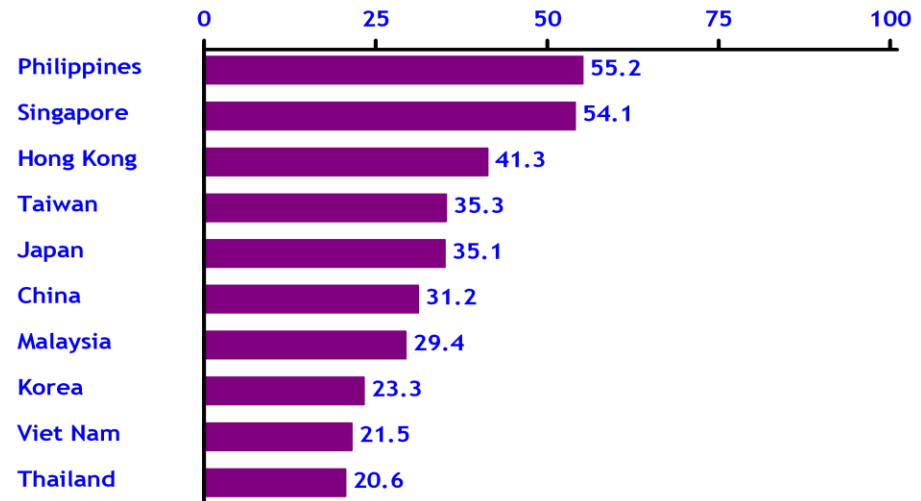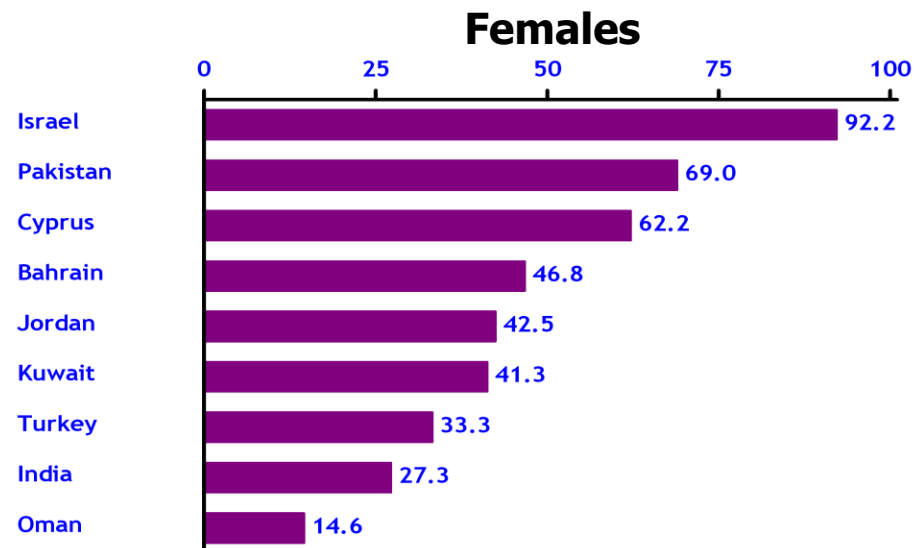## Age-standardized Incidence Rate per 100,000

99.4

82.5

84.6

Korea
20.4

Japan
32.7

18.7

16.5

73.9

84.6

GLOBOCAN 2002, IARC

< 19.5	< 25.9	< 34.2	< 52.2	< 101.1

Incidence of Breast Cancer in Asia

Eastern Asia

Country	Incidence
Philippines	55.2
Singapore	54.1
Hong Kong	41.3
Taiwan	35.3
Japan	35.1
China	31.2
Malaysia	29.4
Korea	23.3
Viet Nam	21.5
Thailand	20.6

Females

Western Asia

Country	Incidence
Israel	92.2
Pakistan	69.0
Cyprus	62.2
Bahrain	46.8
Jordan	42.5
Kuwait	41.3
Turkey	33.3
India	27.3
Oman	14.6

Shin et al. Asian Pacific J Cancer Prev 2009 (selected registry data from CI5 IX)

Change in Breast Cancer Mortality
Ages 25-49,   % Change during 1985-87 to 1995-97

Country	Value
Republic of Korea	36.1
China: rural areas	31.0
Japan	25.8
Ukraine	17.0
Madras	15.3
Estonia	15.2
Russian Federation	14.4
China: urban areas	14.3
Romania	14.2
Finland	14.2
Republic of Moldova	9.1
Latvia	7.6
Argentina	5.1
Norway	4.0
Bulgaria	3.7
Belarus	1.6
France	3.2
Israel	3.7
Croatia	4.2
Netherlands	4.8
Hungary	5.0
Spain	6.0
New Zealand	6.8
Germany	9.2
Lithuania	10.1
Australia	12.3
Portugal	12.8
Italy	13.2
Slovenia	15.4
United States of America	17.1
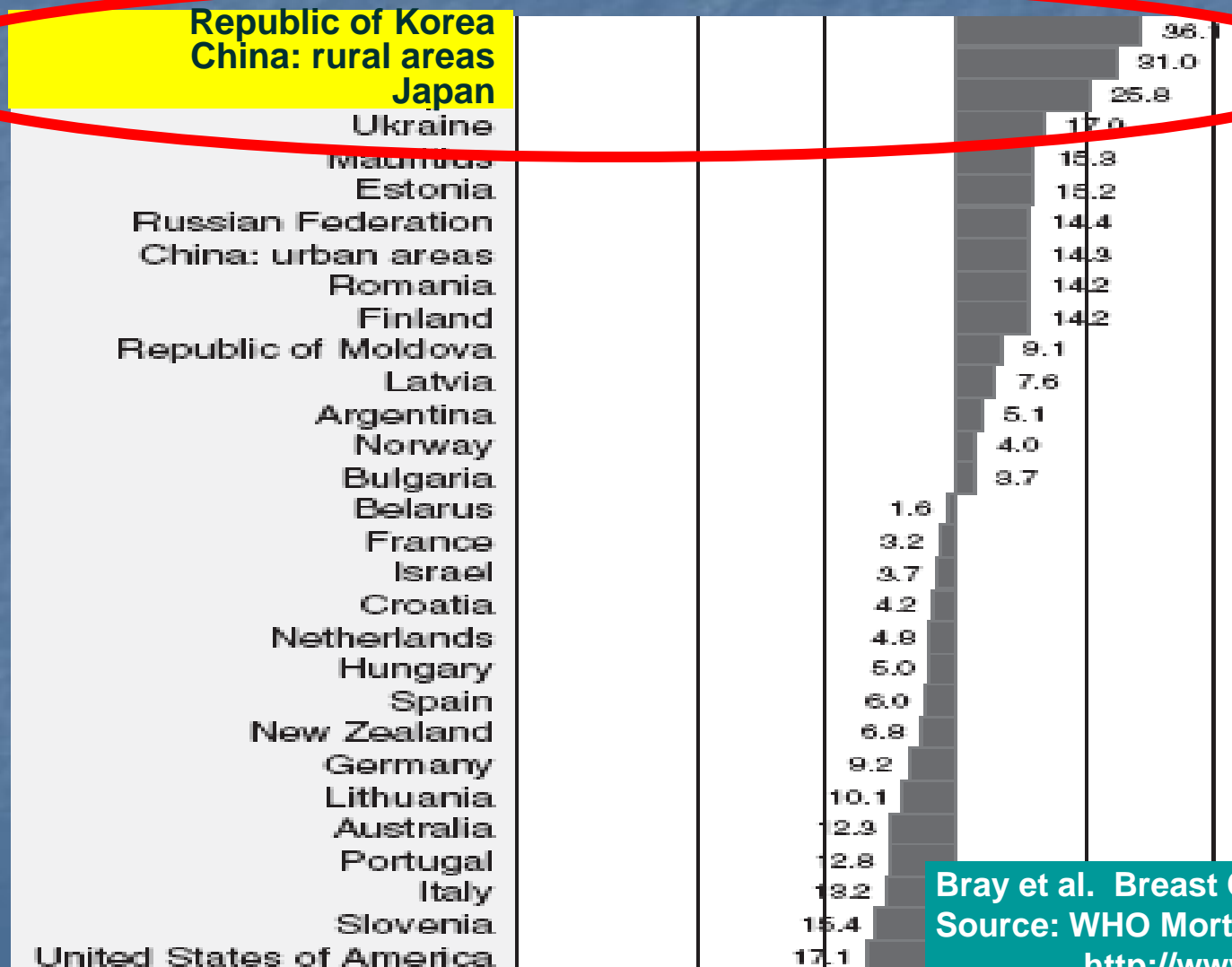
Age Tsunami: Baby Boomer born 1953-1958

|	1980	2005	2018	2030	2050
Total (10,000 persons)	3,812	4,814	4,934	4,863	4,234
15~64 years (10,000 persons)	2,372	3,453	3,598	3,123	2,242
65+ years (10,000 persons)	146	437	707	1,181	1,616
Old Dependency Ratio	6.2	12.7	19.6	37.8	72.1
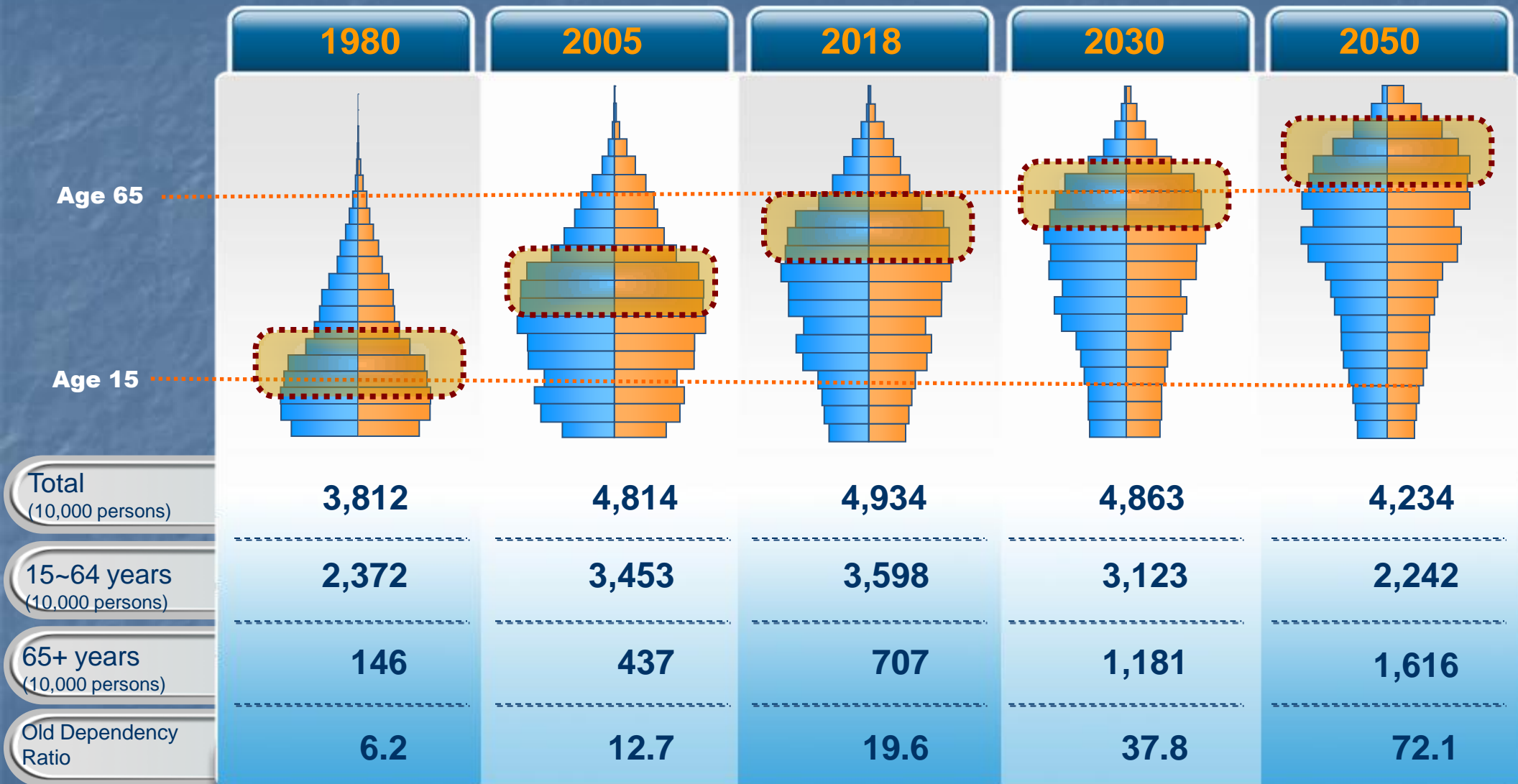
Projection of Breast Cancer Mortality
Korea, all ages, 2005-2020
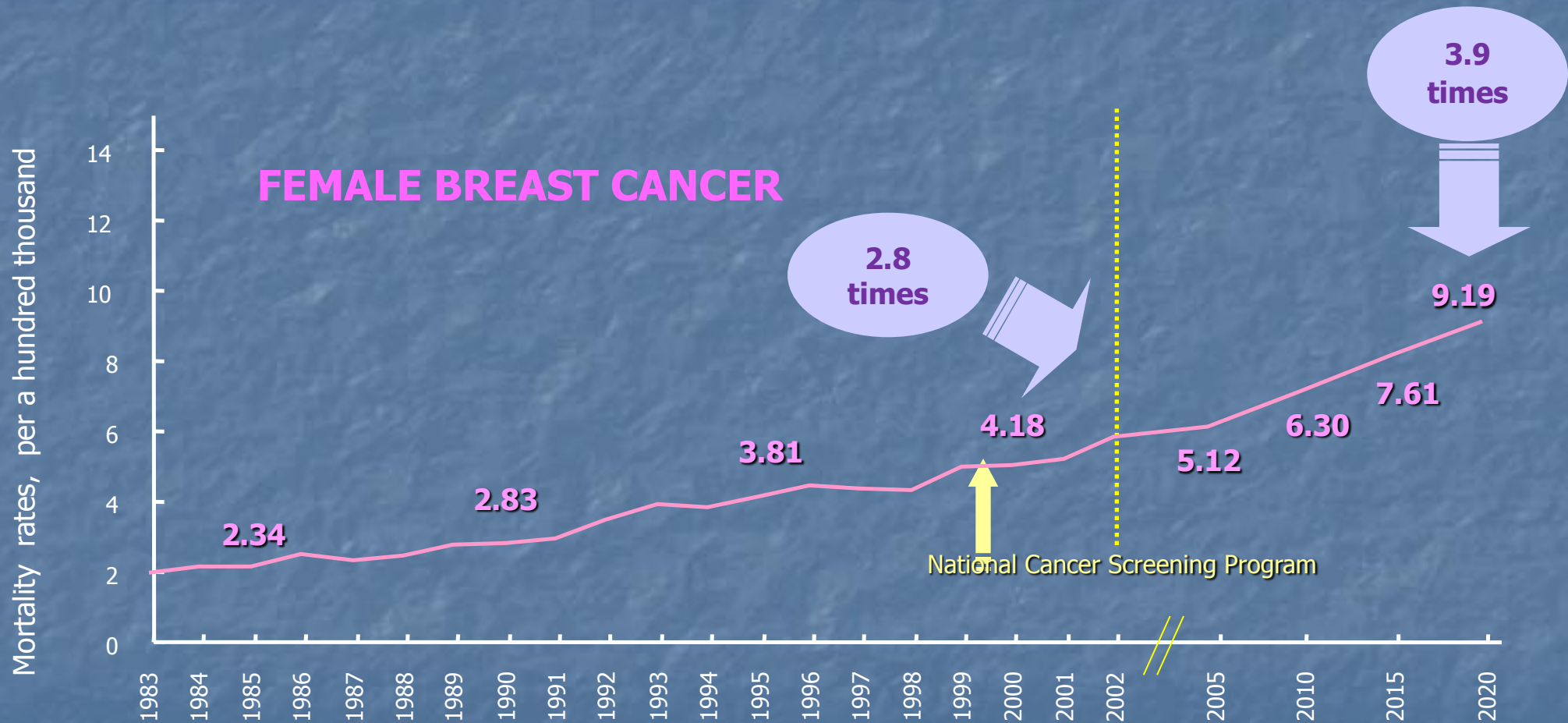
Source : *National Statistical Office* 2002
Choi et al. Asian Pacific J Cancer Prev 2005

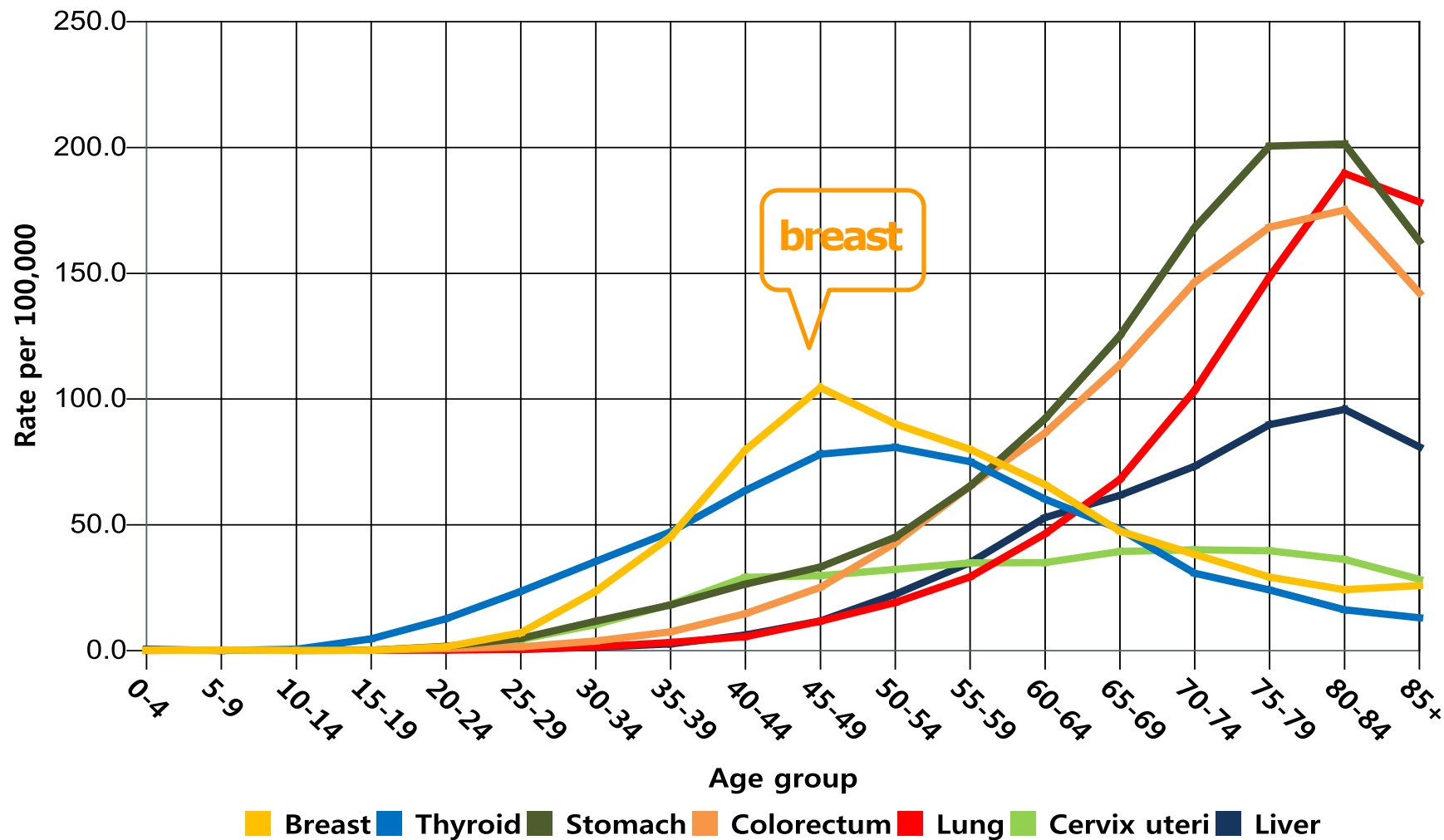# ASR of Breast Cancer of Korean and Japanese Immigrants
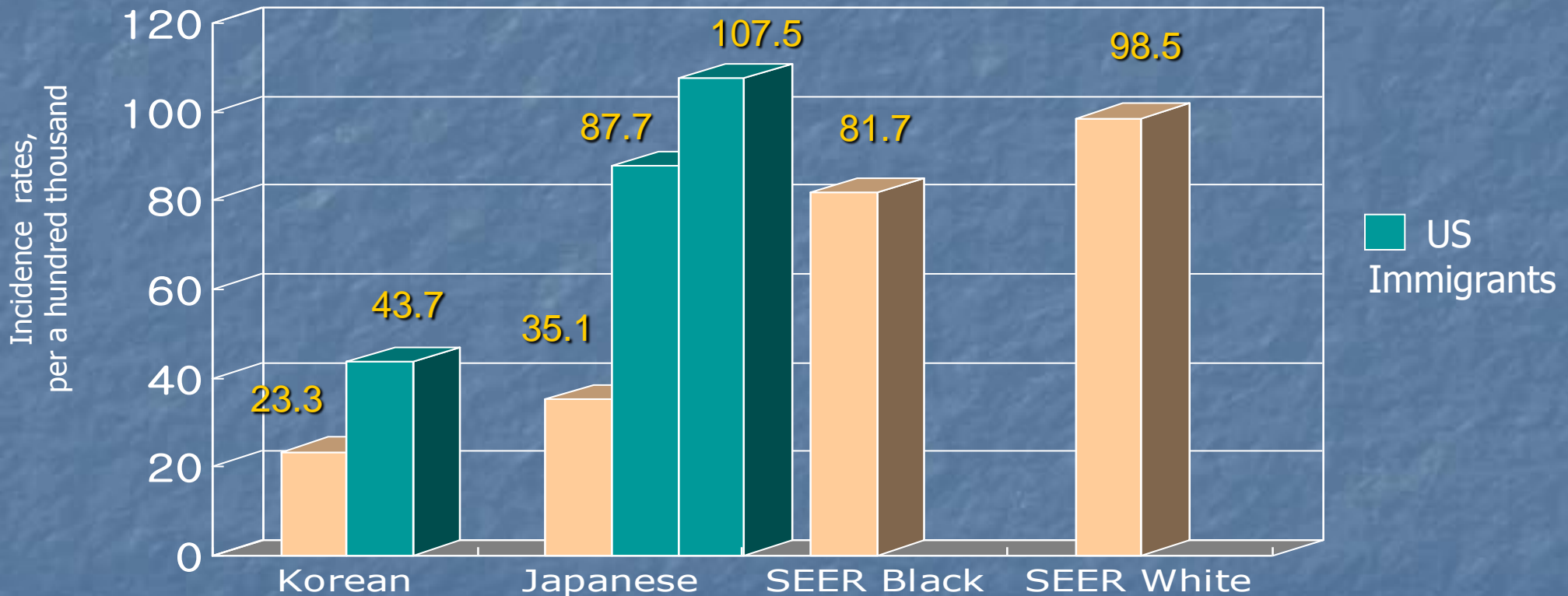
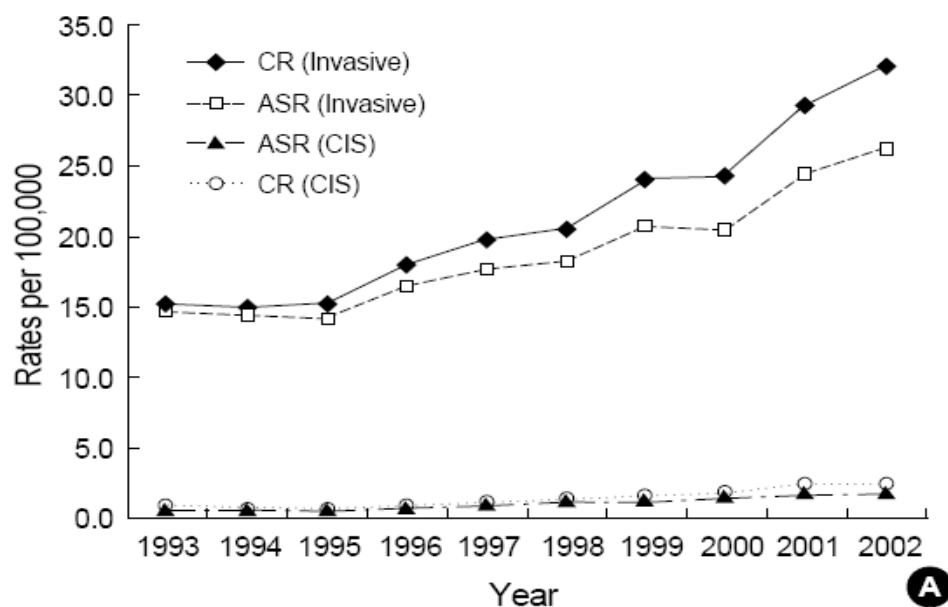Source: Curado et al. Cancer Incidence in Five Continents Vol IX. 2007

Age Incidence Curve

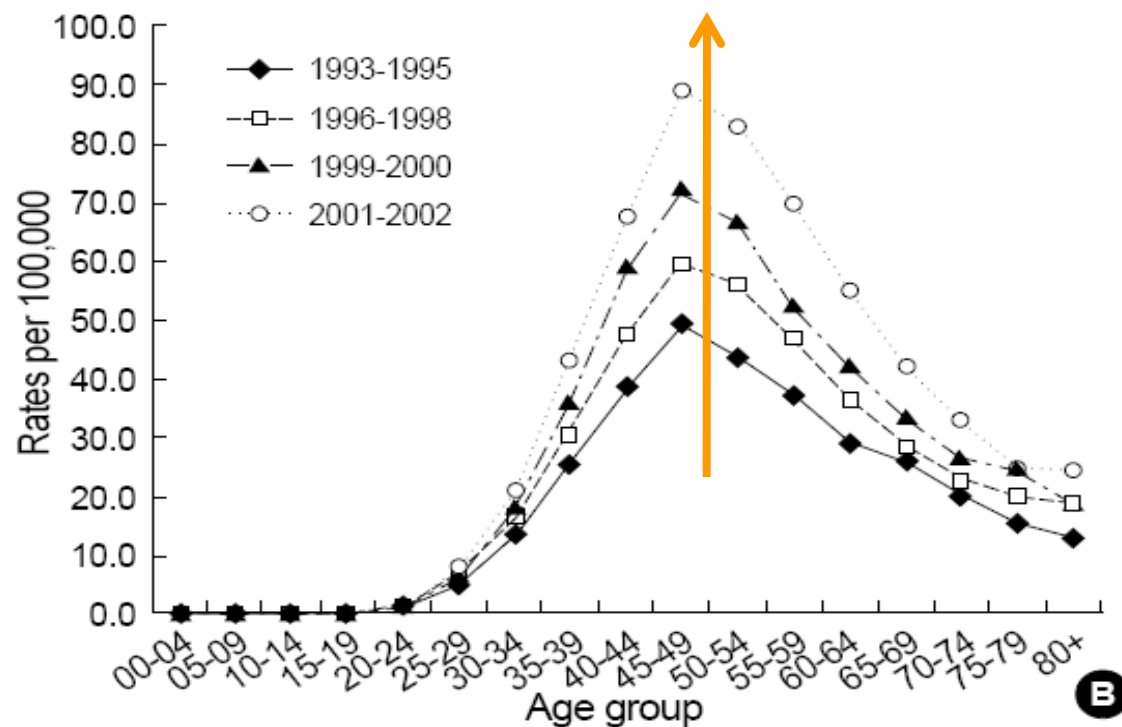**Age-specific Incidence Rates of Major Sites**
Korean Female, 2003~2005

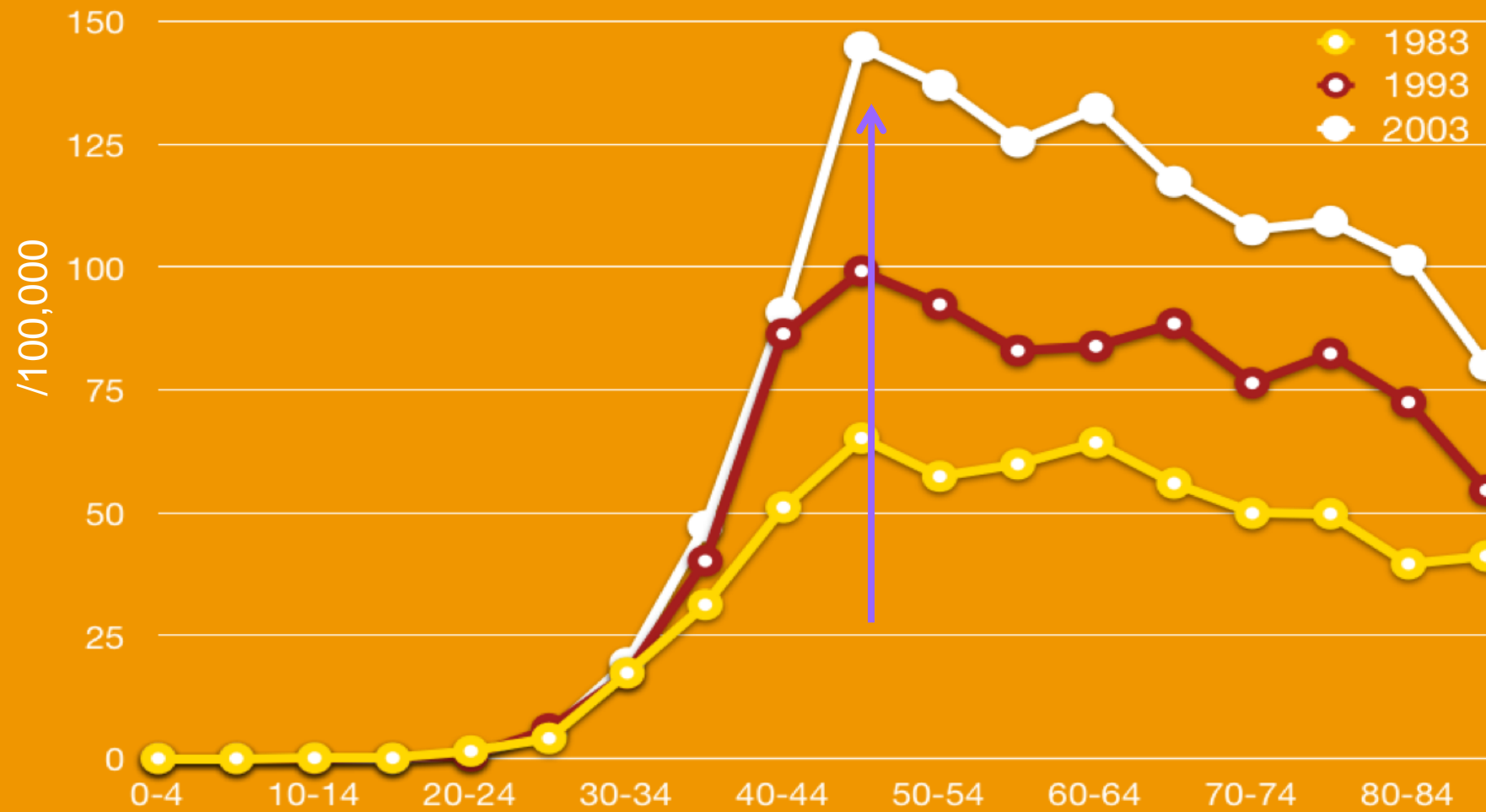# Incidence trends of female breast cancer in 1993-2002, Korea

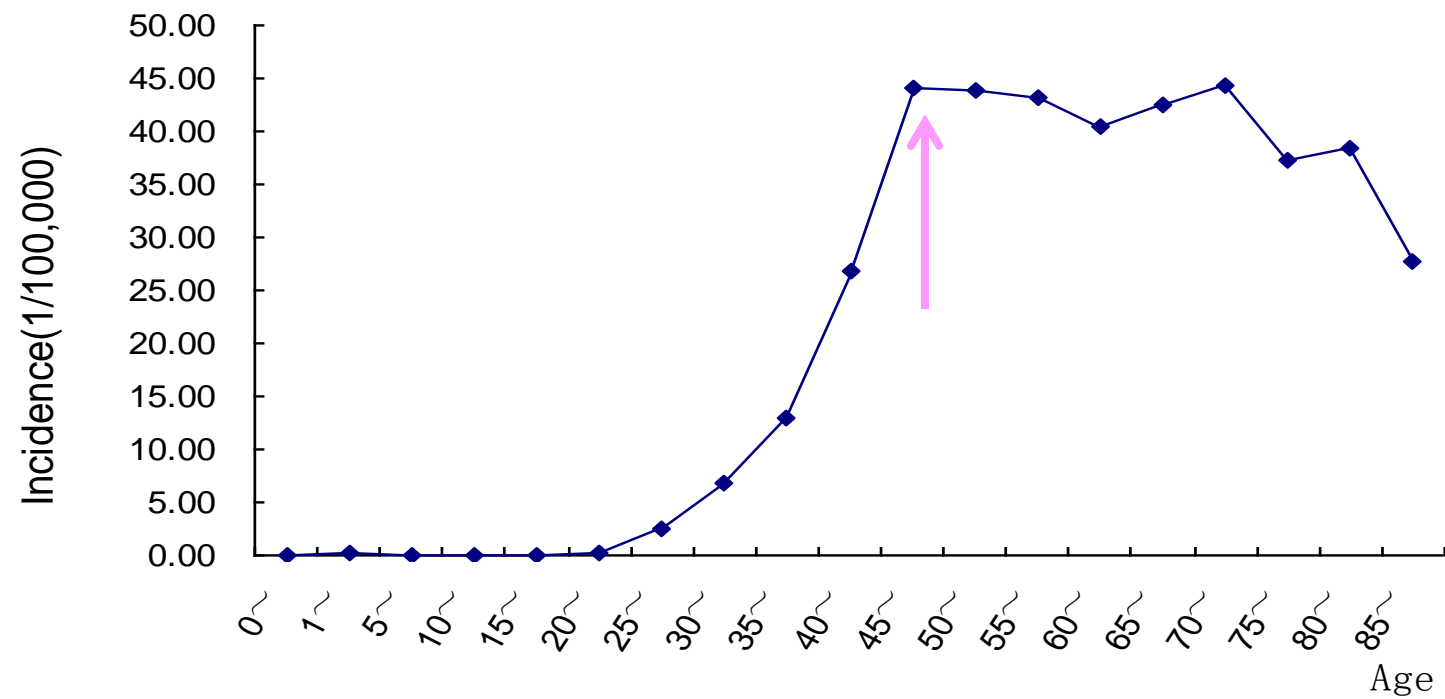(A) Incidence trends of female invasive breast cancer and CIS by year of diagnosis

(B) Age-specific incidence rates of female invasive breast cancer by time period of diagnosis

Age-specific Incidence of Breast Cancer in Japan

from National Cancer Center Cancer Information Service, Japan

Age-specific Incidence of Breast Cancer in China 2004

Epidemiology of BC in Karachi, Pakistan

⅓ of all female cancers
ASIR = 53.8 / 100,000
60% of newly diagnosed BC were women below 50 years

ductal cell carcinoma: 92%
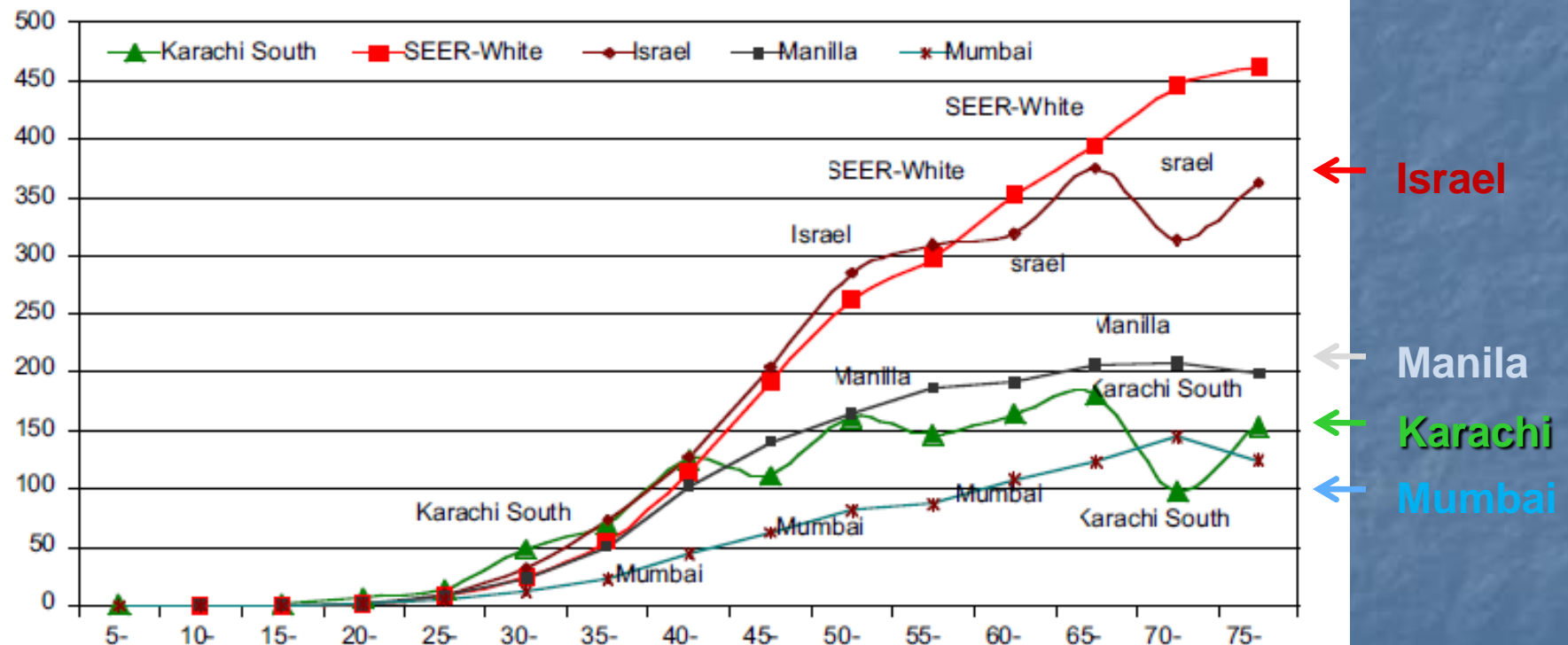 regional LN(+): 56%
higher in non-Muslim

Figure 1. Comparison of Age-dependent Breast Cancer Incidences in Different Registries

Bhurgri et al. Asian Pacific J Cancer Prev 2007

Epidemiology of BC in Malaysia

the most common
1 in 20 women develop BC in lifetime
ASIR = 46.2 / 100,000
higher in Chinese > Indians > Malays
commonest in 40-49 years
over 50% of BC under age 50 years

ER(+): 55.7%
stages I-II: 60-70%
survival worse in Malays

similar lifestyle factors

less exercise, high fat diet
parity, breastfeeding

Kamarudin et al. Asian Pacific J Cancer Prev 2006

Table 2. Female Breast Cancer Age Incidence in Malaysia (NCR Report)			
Age	No	%	CR
0-9	2	0.1	0.1
10-19	5	0.1	0.3
20-29	39	1.0	2.5
30-39	457	12.2	34.1
40-49	1255	33.6	111.9
50-59	1141	30.5	159.8
60-69	571	15.3	137.7
70+	268	7.2	97.9

CR, cancer incidence rate/100,000

Figure 3. Age-dependent Incidence of Breast Cancer
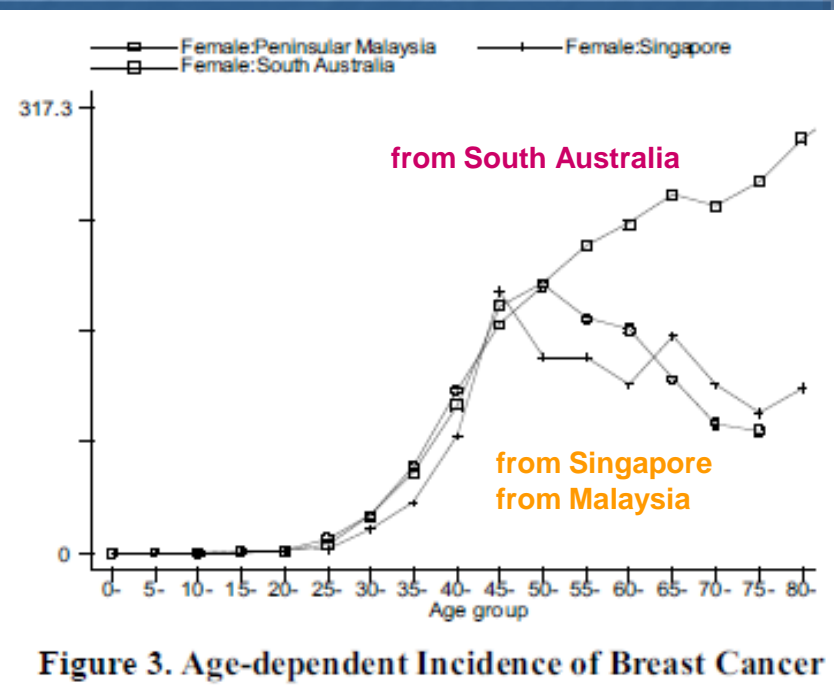
Yip et al. Asian Pacific J Cancer Prev 2006

Age-Incidence Curves of Breast Cancer
in selected Asian Countries

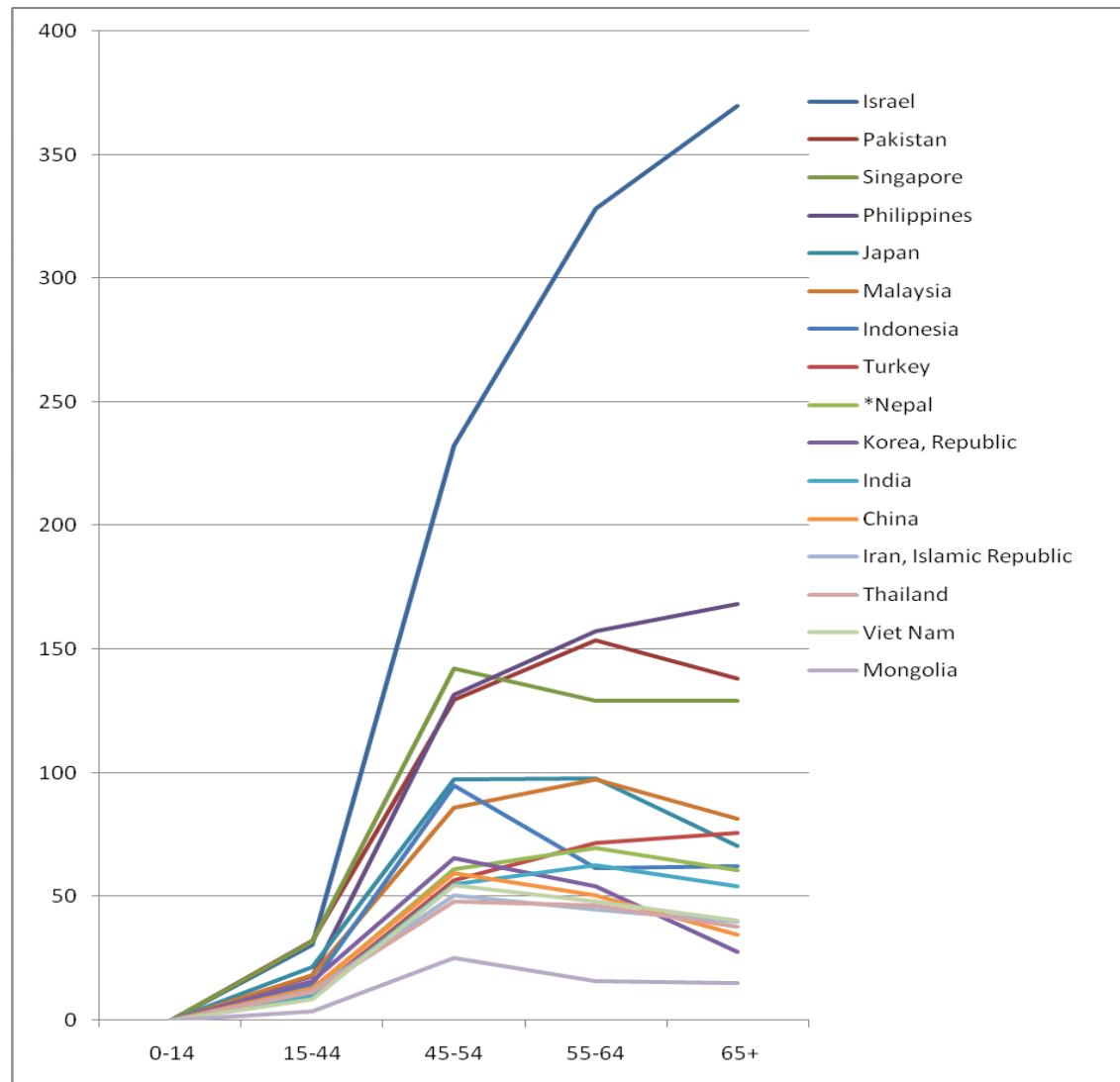| Countries	All ages	ASR (World)
Pakistan	35.6	50.1
Singapore	58.9	48.7
Philippines	33.5	46.6
Japan	49.6	32.7
Malaysia	26.2	30.8
Indonesia	23.3	26.1
Turkey	19.9	22.0
Nepal	15.6	21.8
Korea	23.5	20.4
India	16.5	19.1
China	20.1	18.7
Iran	13.4	17.1
Thailand	16.3	16.6
Viet Nam	13.1	16.2
Mongolia	4.9	6.6

Source: Globocan 2002

ER/PR Status in US by Ethnic Group

Unit: %

Ethnic Groups	ER+PR+	ER+PR-	ER-PR+	ER-PR-
White	63.9	12.8	3.6	19.8
Blacks	48.3	11.8	5.1	34.8
Hispanic	56.7	12.0	4.6	26.7
Japanese	65.6	12.5	4.8	17.1
Chinese	60.6	11.7	5.1	22.6
Korean*	46.5	12.8	4.7	36.1
Filipino	60.2	11.6	4.9	23.3
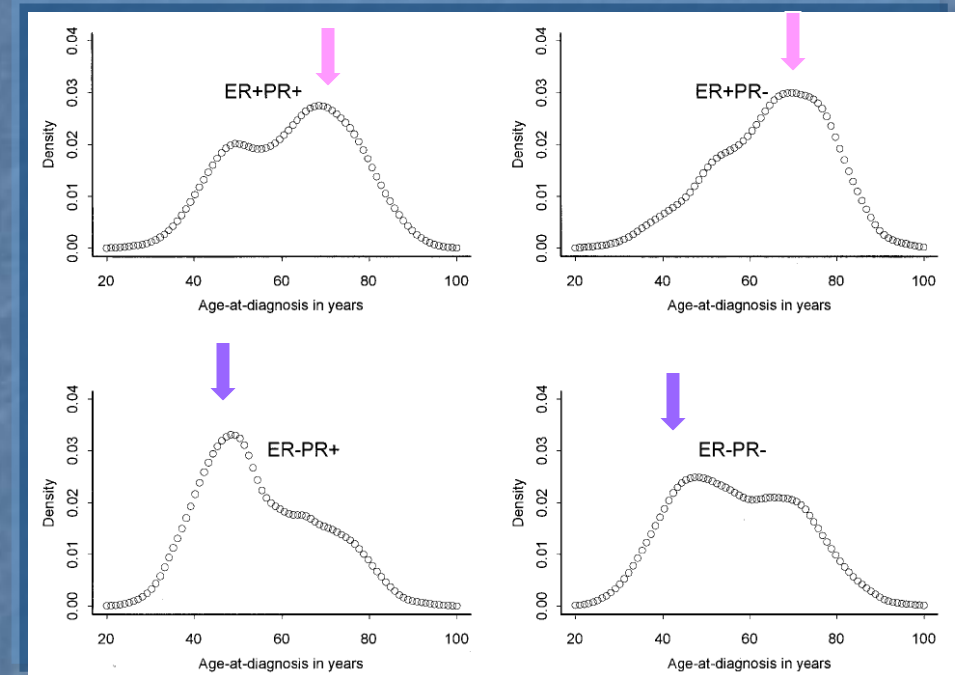
Age frequency density plot

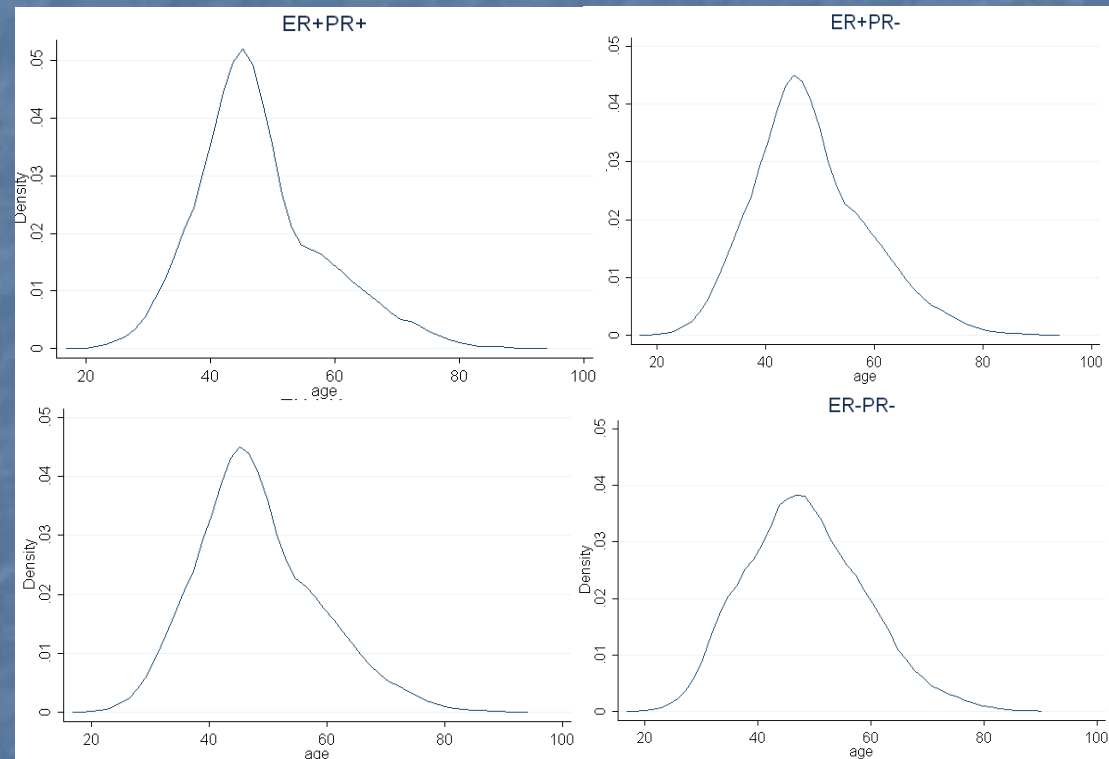**Chu et al. Cancer 2001;92:37-45**
*Li et al. Cancer Epidemiol Biomarkers Prev 2002;11:601-7
Figure from Anderson et al. JCO 2001;19:18-27

ER/PR Status
28,210 Korea Breast Cancer Society, 1992-2006

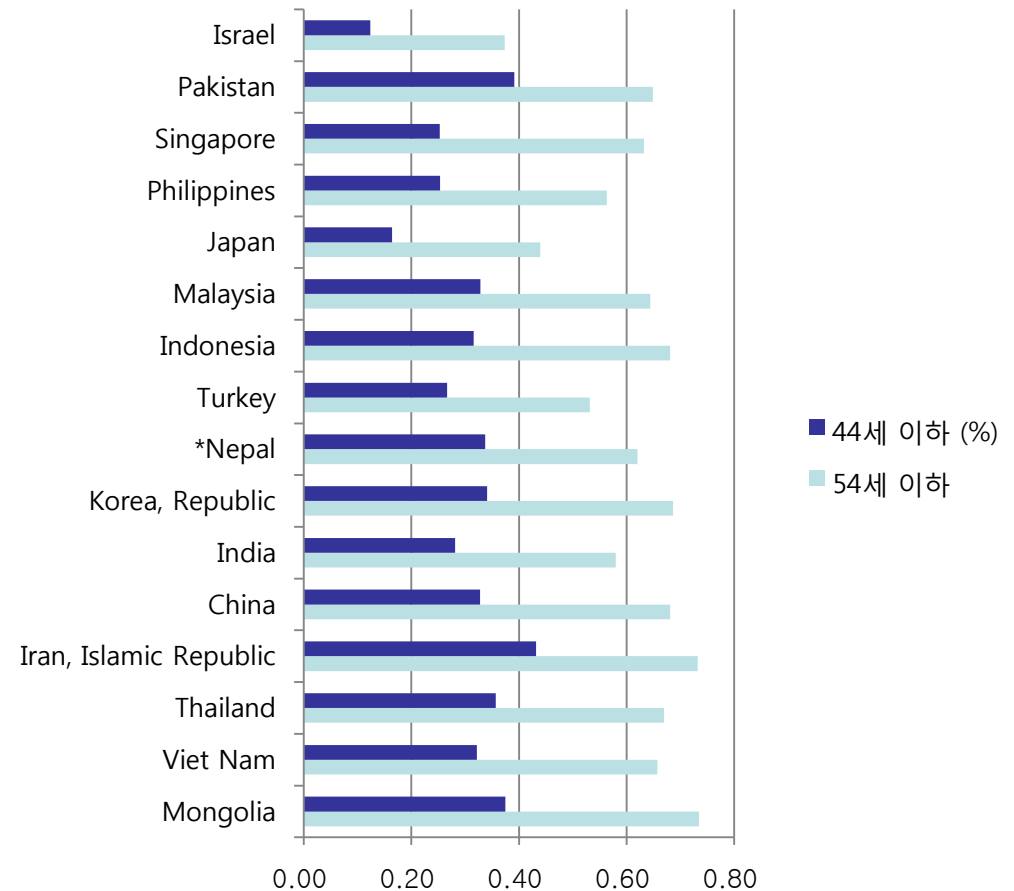| ER/PR	ER+	ER-	Total
PR+	46.2%	7.3%	53.5%
PR-	12.5%	34.0%	46.5%
Total	58.7%	41.3%	100%

Age frequency density plot

Breast Cancer in Younger Women in Asia
% of breast cancer under 54 / 44 years old

Breast Incidence case	ASR (World)	under 54 yrs	Under 44 yrs
Israel	90.8	0.37	0.12
Pakistan	50.1	0.65	0.39
Singapore	48.7	0.63	0.25
Philippines	46.6	0.56	0.25
Japan	32.7	0.44	0.16
Malaysia	30.8	0.64	0.33
Indonesia	26.1	0.68	0.32
Turkey	22.0	0.53	0.27
Nepal	21.8	0.62	0.34
Korea, Republic	20.4	0.69	0.34
India	19.1	0.58	0.28
China	18.7	0.68	0.33
Iran	17.1	0.73	0.43
Thailand	16.6	0.67	0.36
Viet Nam	16.2	0.66	0.32
Mongolia	6.6	0.73	0.38

44세 이하 (%)
54세 이하

Breast Cancer in Young Women

Period Effect?

China

Japan

Korea

China legend:
- China, Hong Kong (red)
- China, Jiashan (green)
- China, Harbin (blue)
- China, Shanghai (orange)

Japan legend:
- Japan, Aichi (red)
- Japan, Miyagi (green)
- Japan, Osaka (blue)
- Japan, Hiroshima (orange)
- Japan, Nagasaki (gray)

Korea legend:
- Korea, Busan (red)
- Korea, Daegu (green)
- Korea, Daejeon (blue)
- Korea, Gwangju (orange)
- Korea, Incheon (gray)
- Korea, Seoul (purple)

International Agency for Research on Cancer (IARC) - 12.8.2009

Shin et al. Asian Pacific J Cancer Prev 2009 (selected registry data from CI5 IX)
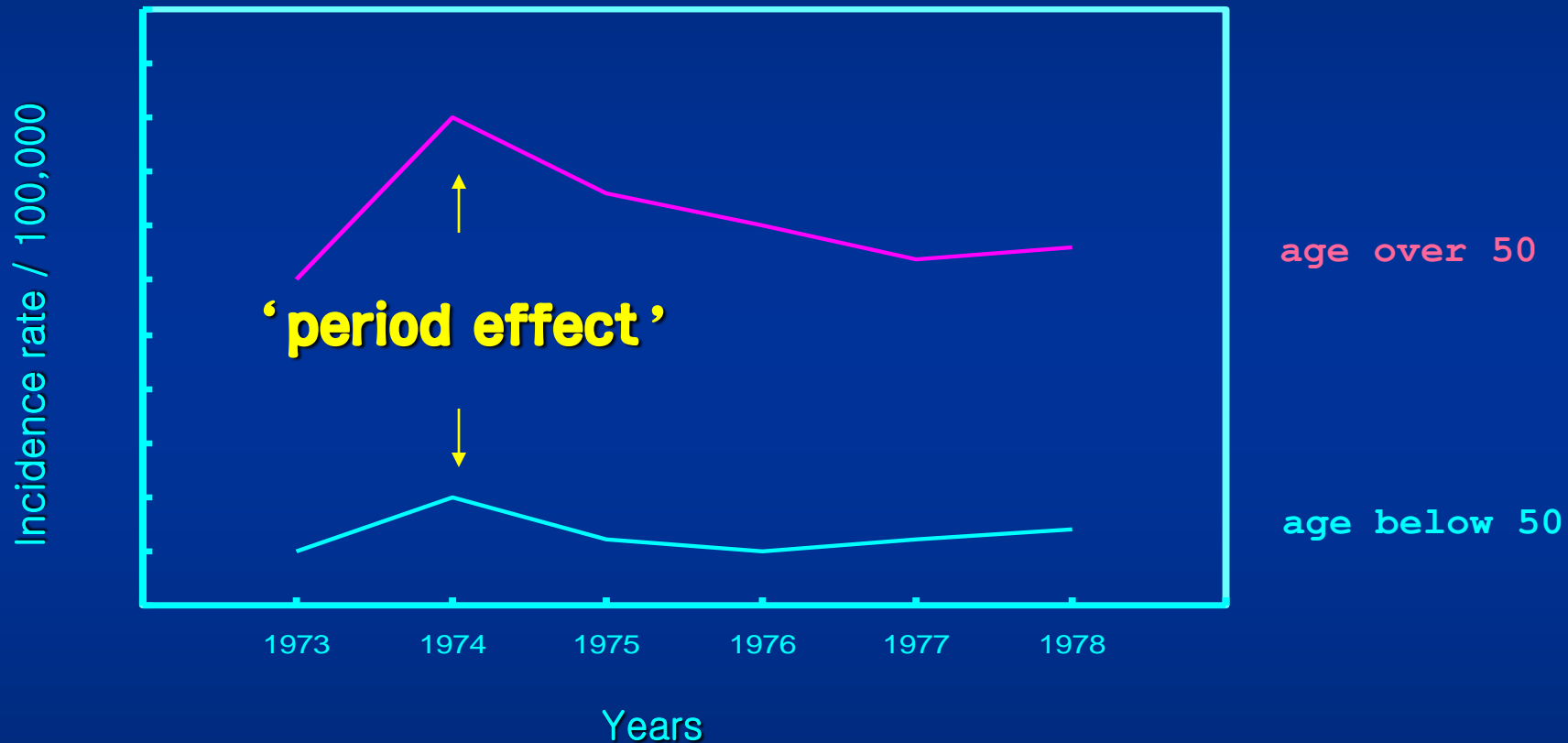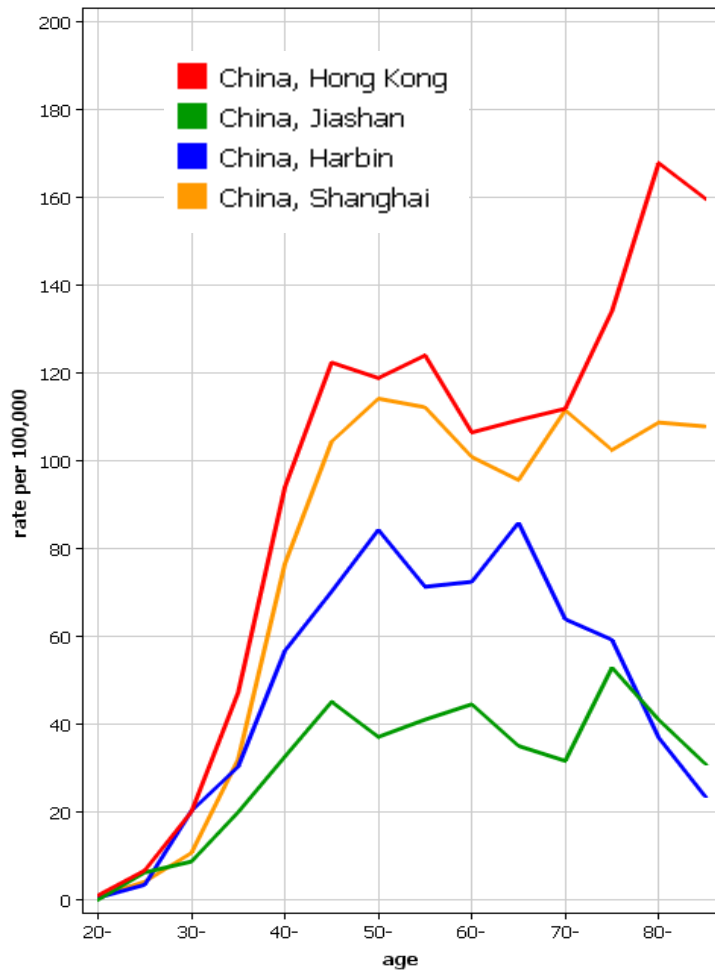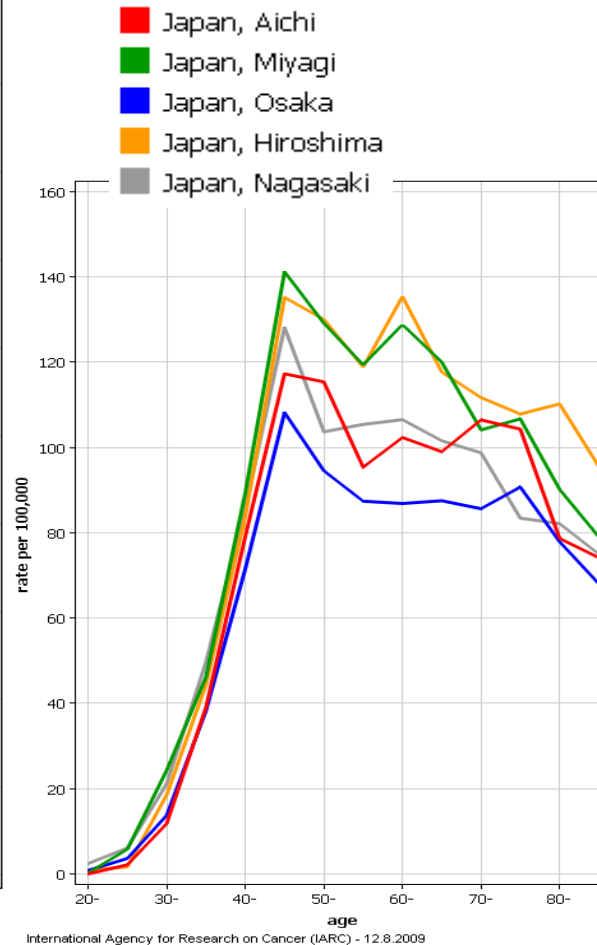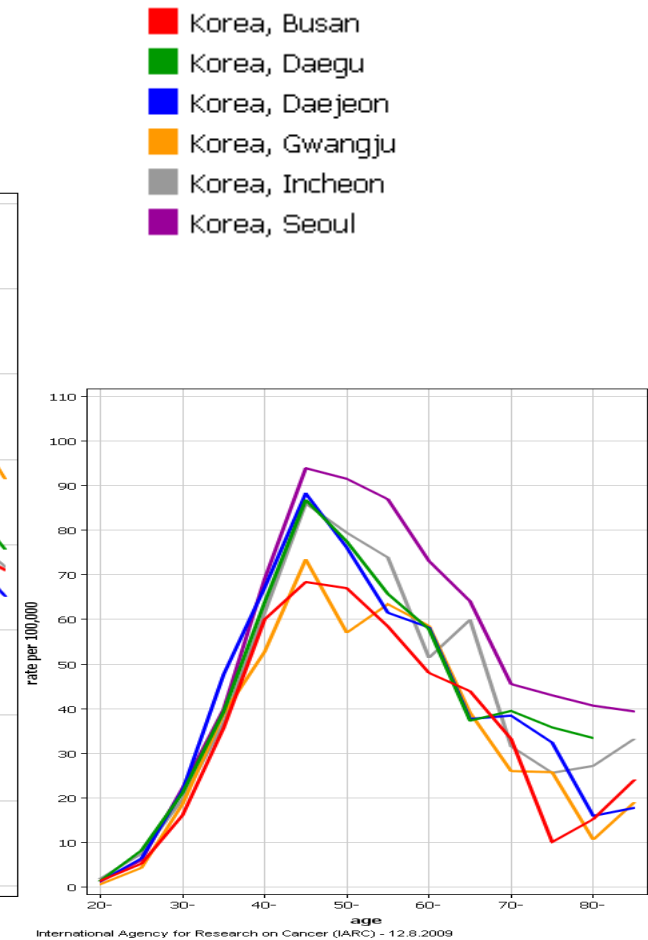
Breast Cancer Screening Rates
Age Groups, Nationwide Korea, 2004-2007

(%)   ■ 40-49   ■ 50-59   ■ 60-69   ■ 70 year and over
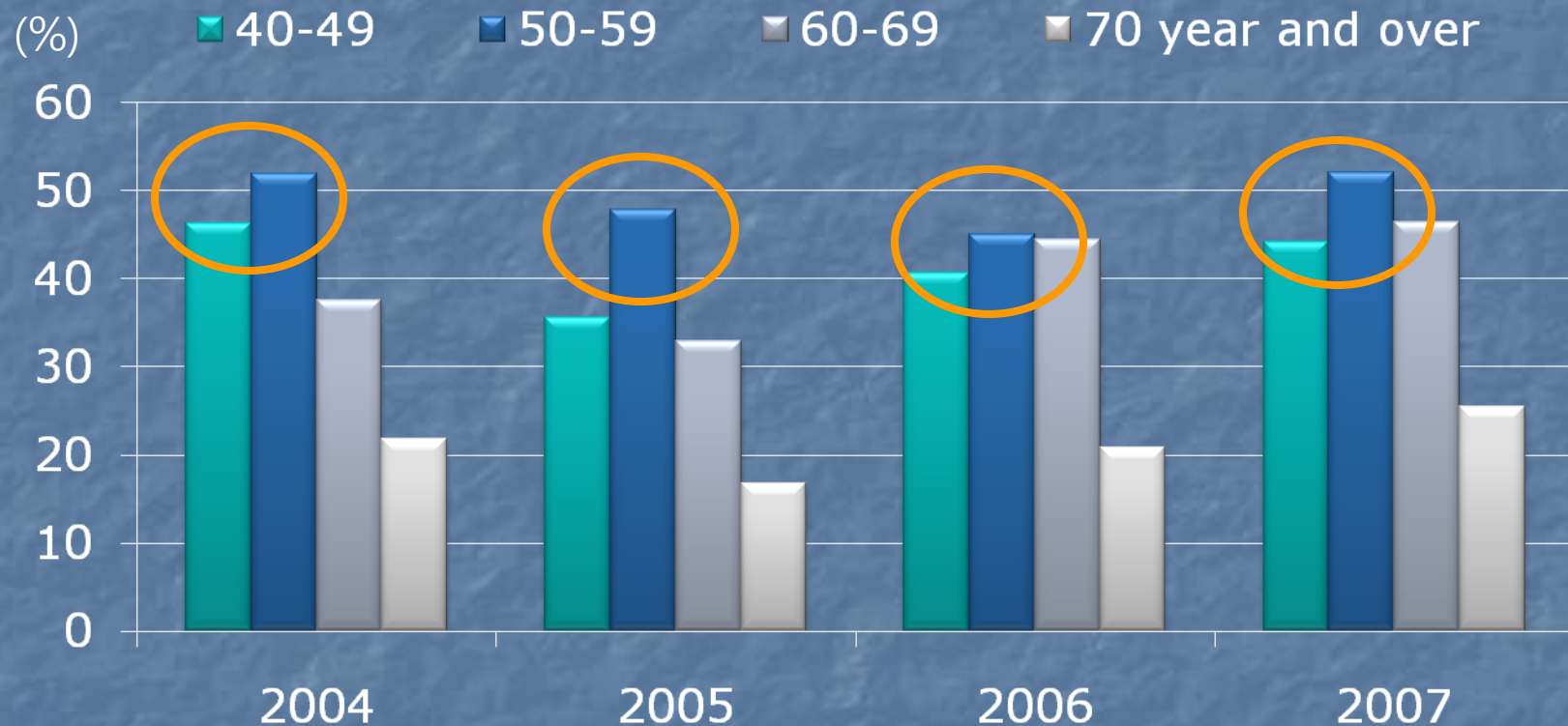
Source: National Cancer Screening Behavior Survey, 2004-2007, National Cancer Center

Voluntary Breast Cancer Screening

Participation for Cancer Screening by Age
National Livelihood Survey, Japan, 2007

Legend: 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80+

Stomach: 2.0, 8.3, 23.6, 27.6, 28.8, 26.2, 13.5

Lung: 4.7, 8.1, 21.7, 24.0, 22.9, 19.5, 11.3

Cervix: 11.3, 26.8, 32.7, 28.1, 20.3, 11.6, 3.1

Breast: 2.7, 13.8, 27.0, 26.4, 20.9, 12.4, 3.3

Colorectum: 1.7, 6.2, 19.3, 24.7, 26.7, 24.5, 11.7

Data source: National Livelihood Survey Japan 2007
National Statistics Center, http://www.e-stat.go.jp/SG1/estat/eStatTopPortalE.do
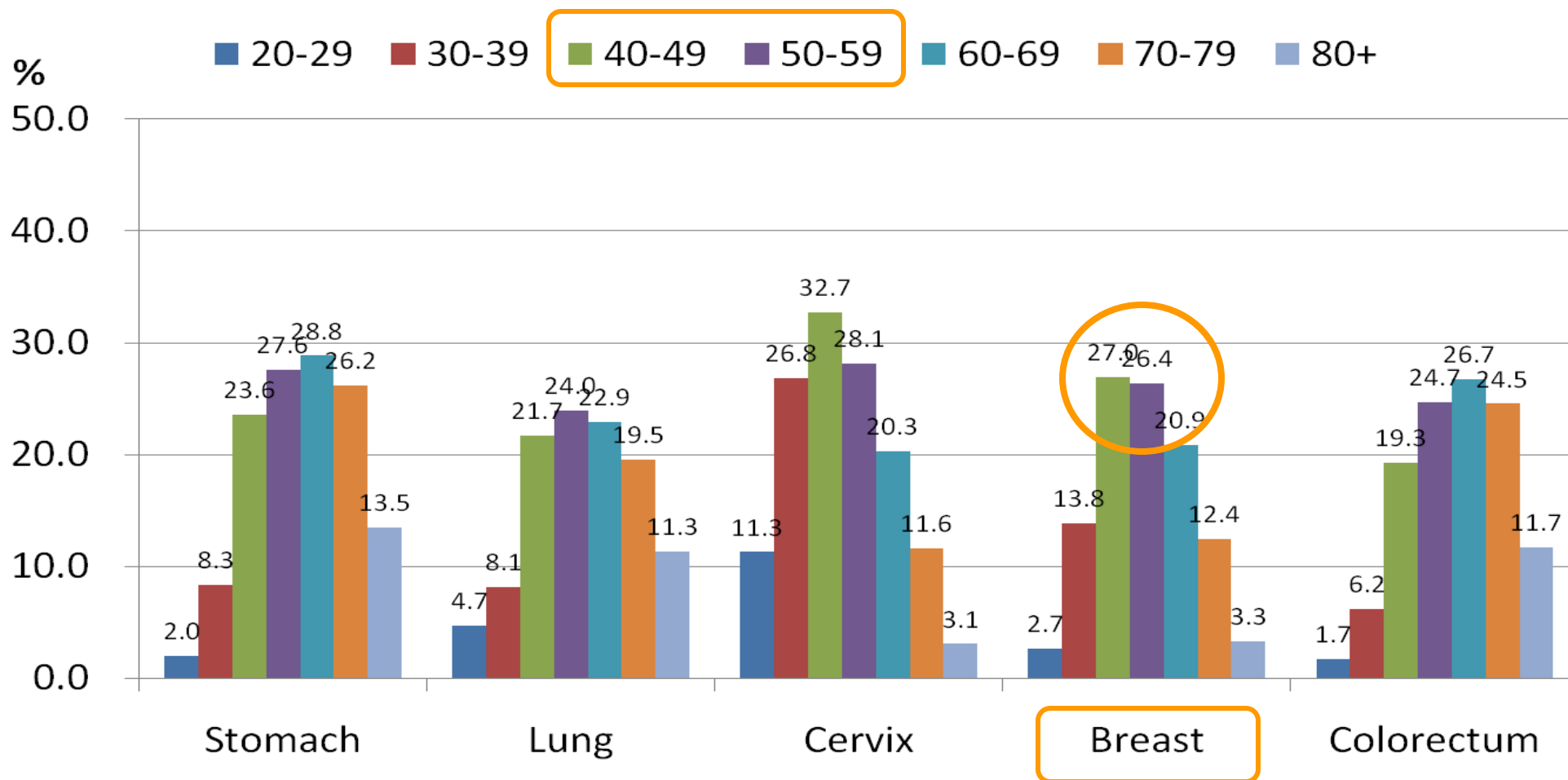
Breast Cancer in Young Women

Age-Cohort Effect?

Age-adjusted Incidence of Breast Cancer in Korea
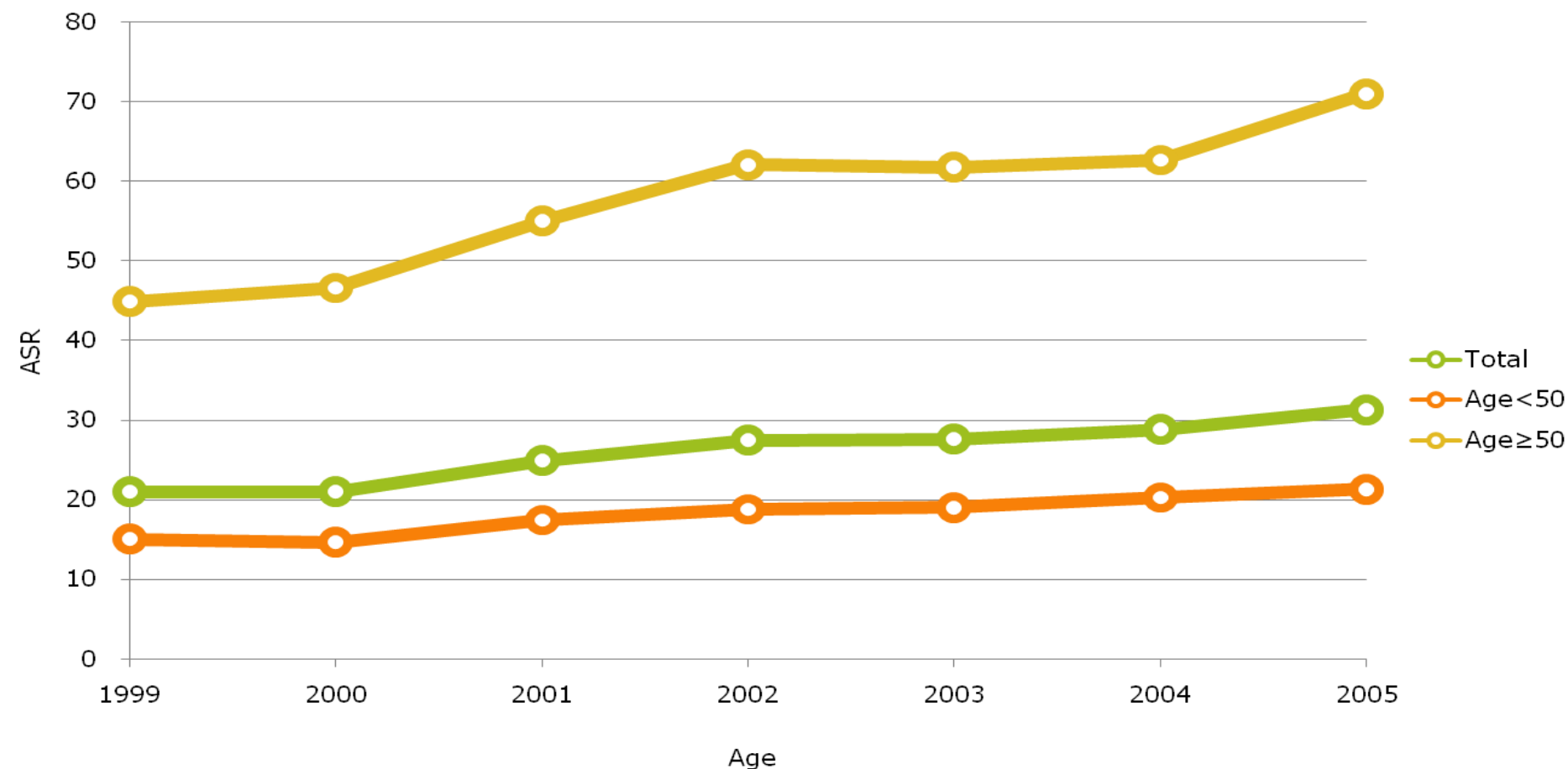
Incidence Data Source: The Korea Central Cancer Registry, 2008
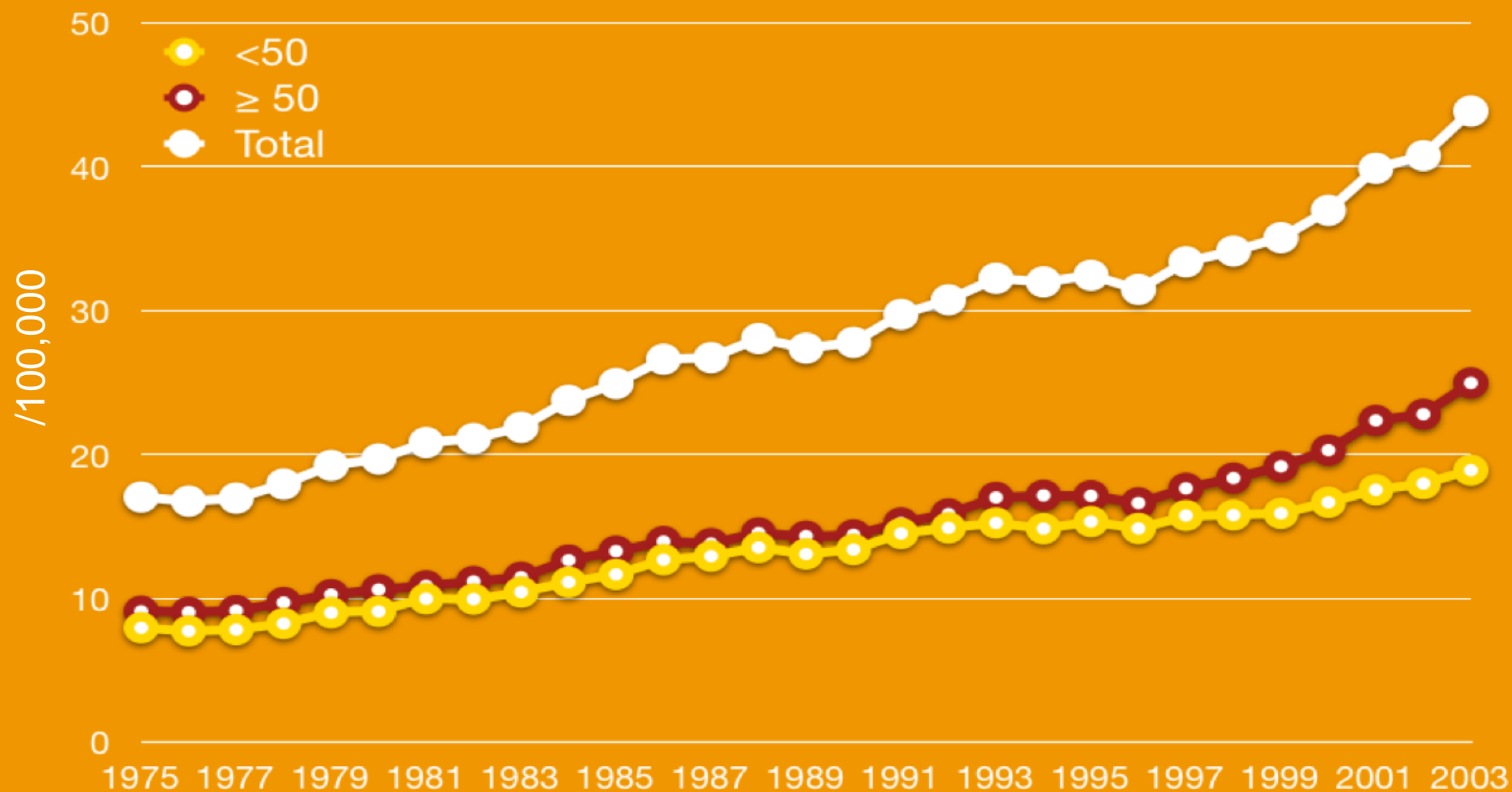
Age-adjusted Incidence of Breast Cancer in Japan

estimated by data from National Cancer Center Cancer Information Service, Japan

Period Trends in Breast Cancer Mortality: Korea
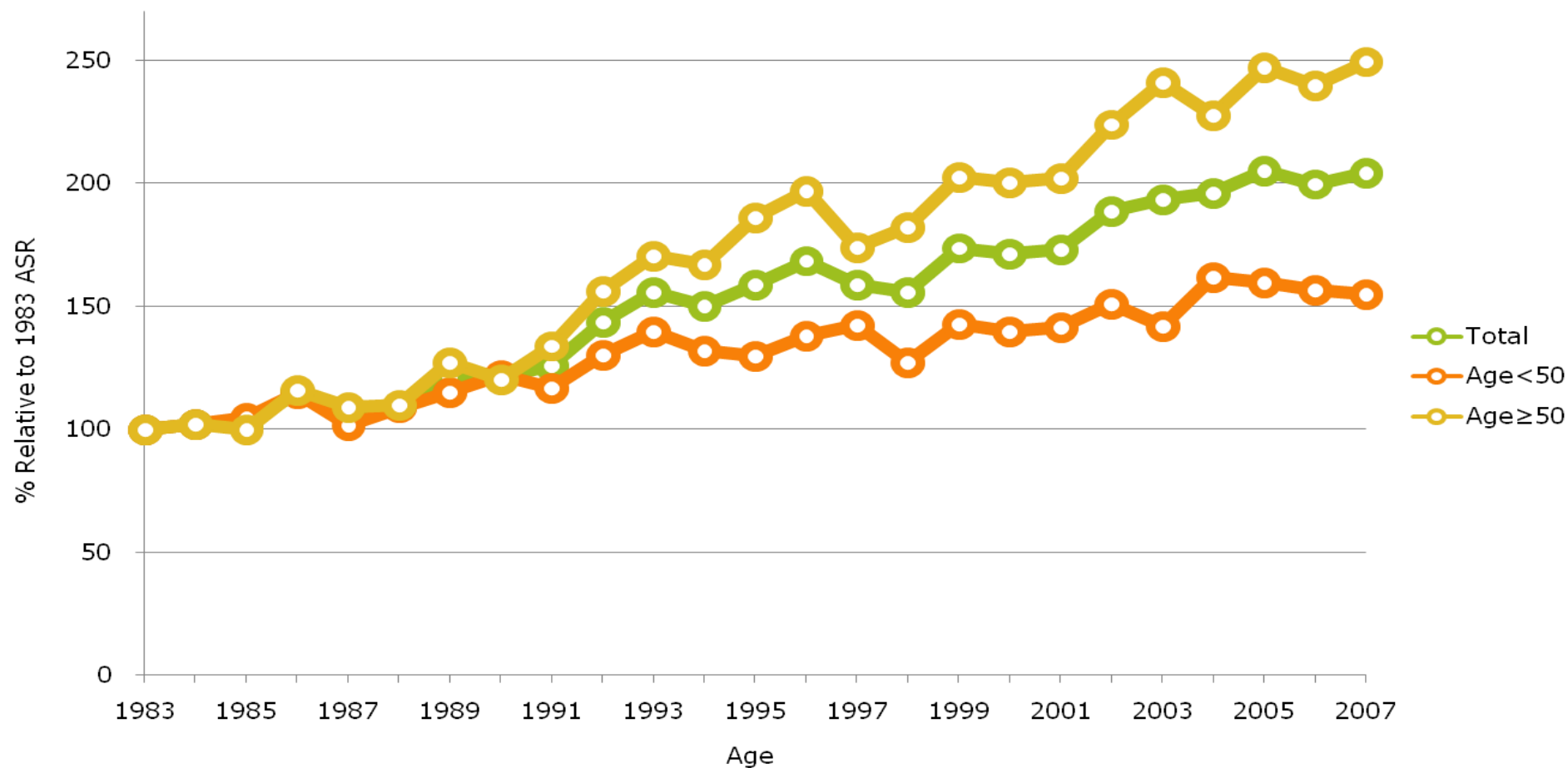
Mortality Data Source: Korea National Statistical Office, 2008

Period Trends in Breast Cancer Mortality: Japan

Legend:
- <50
- ≥ 50
- Total

Y-axis: % relative to 1958 rate (0, 100, 200, 300)

X-axis: 1958 1961 1964 1967 1970 1973 1976 1979 1982 1985 1988 1991 1994 1997 2000 2003 2006
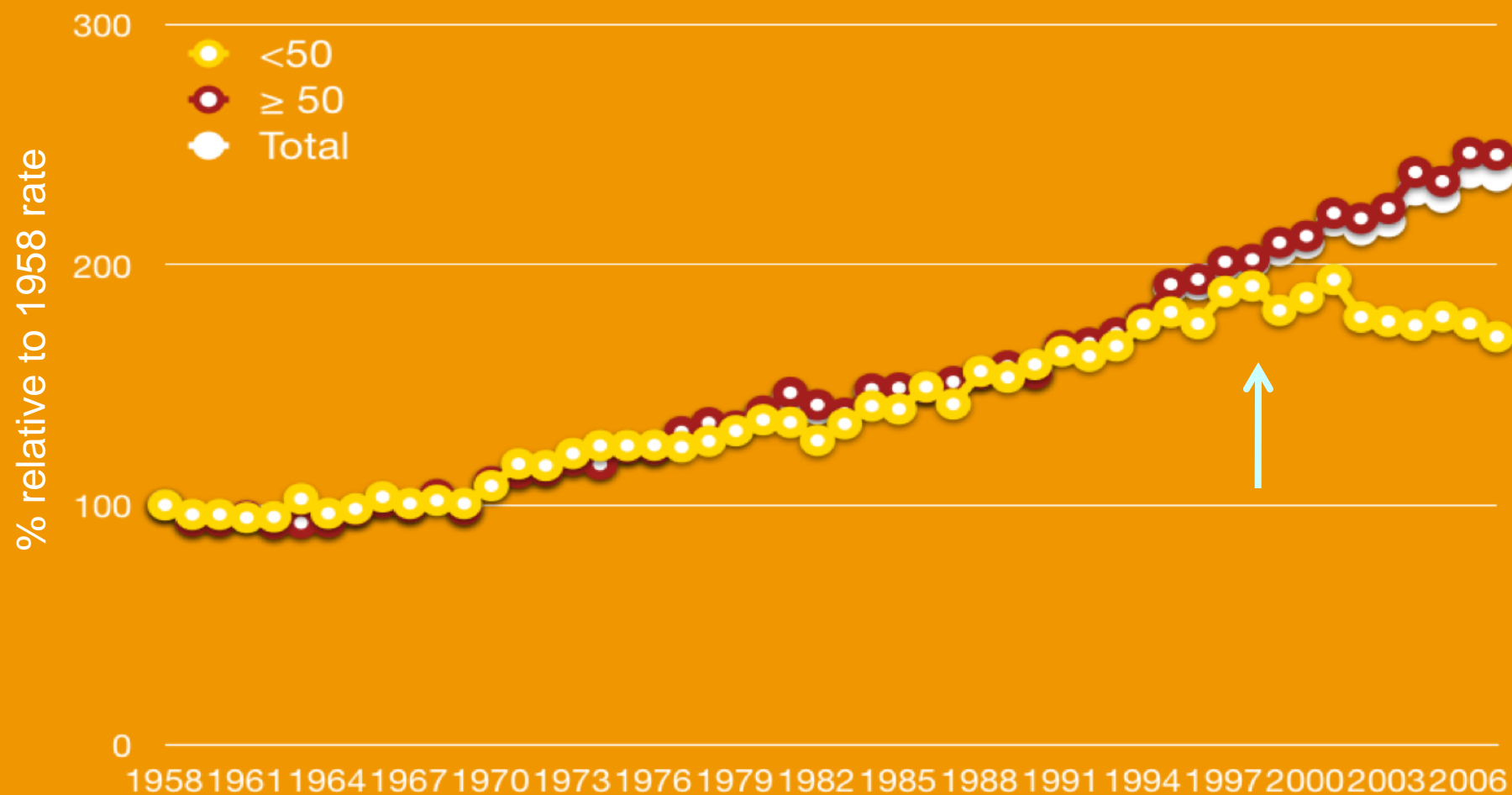
estimated by data from National Cancer Center Cancer Information Service, Japan

Breast Cancer Mortality
1970–1993, by Age Group

female 55+ years

all women

females 0–54 years

% of 1970 mortality rate

Betty Ford
(1974)

recoding

Years

Bailar. NEJM 1997;336:1569
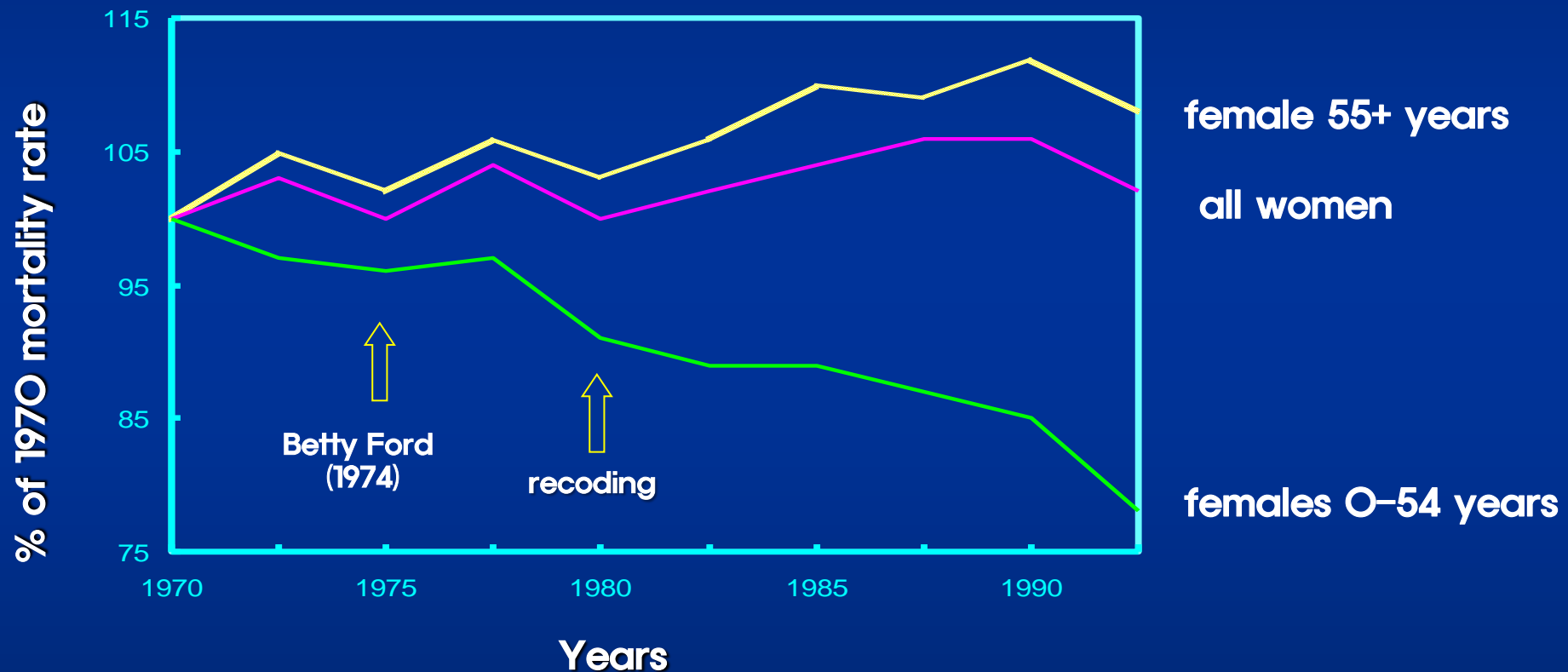
Life-time Risk of Breast Cancer

Over-nutrition in childhood

Genetic susceptibility

Early menarche Late menopause

Estrogen-augmented-by-Progesterone

Nulli-parity Late marriage Late FTP No lactation HRT

Physical exercise Postmenopausal obesity

서울대학교
SEOUL NATIONAL UNIVERSITY
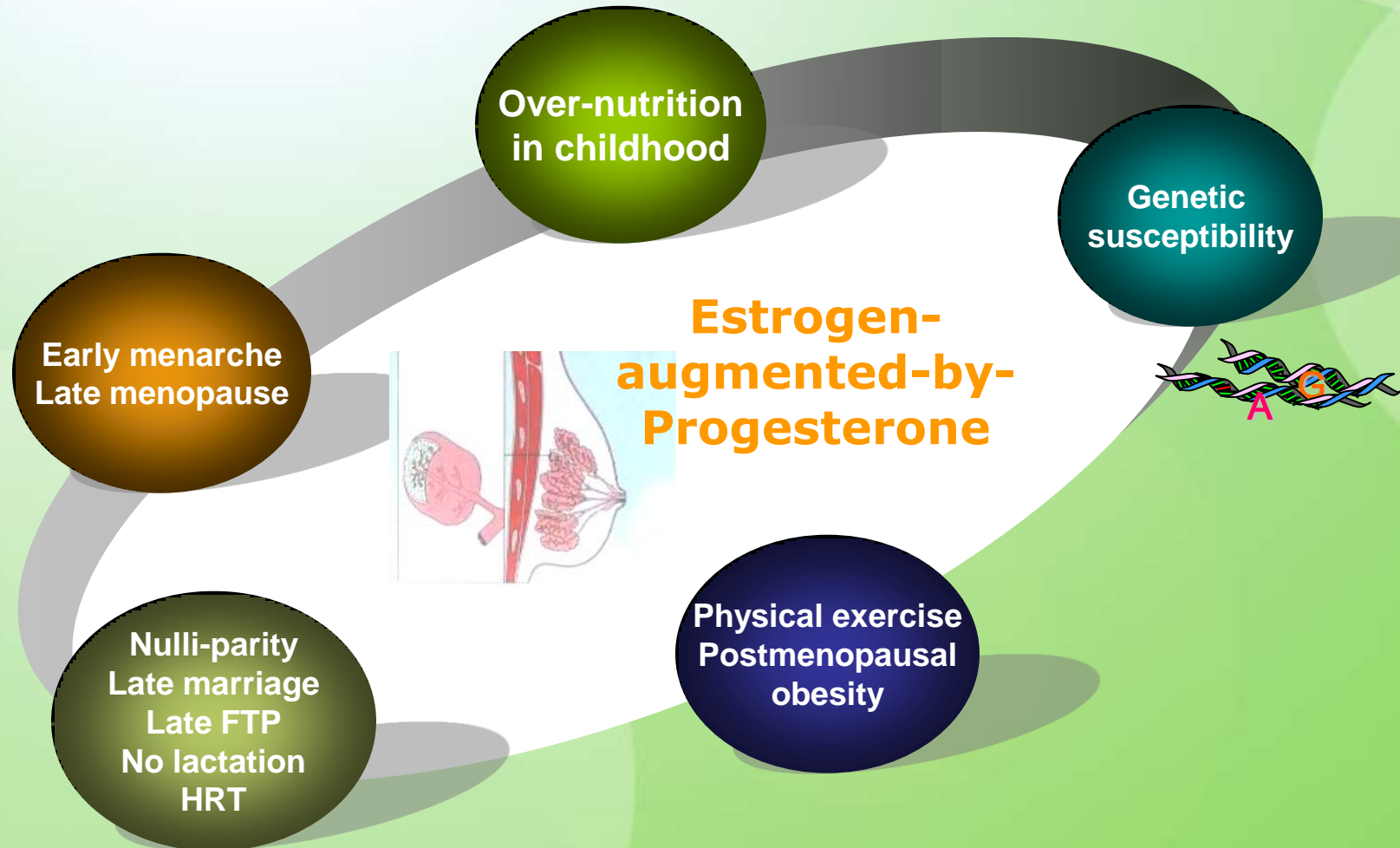
Breast Feeding
Case-control study, Korea, 1997-2003
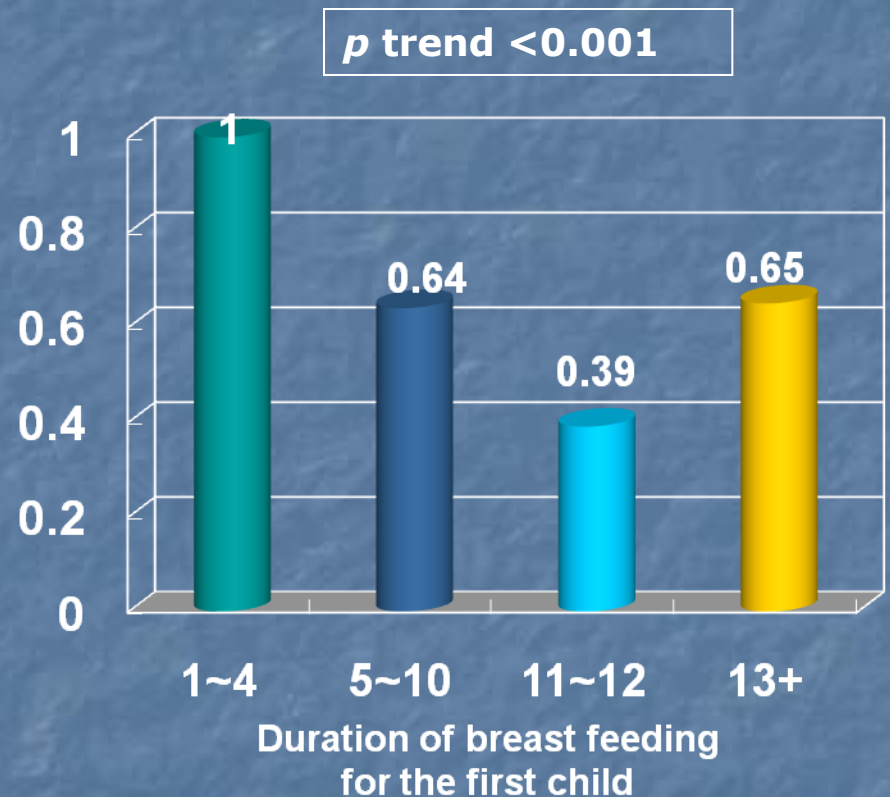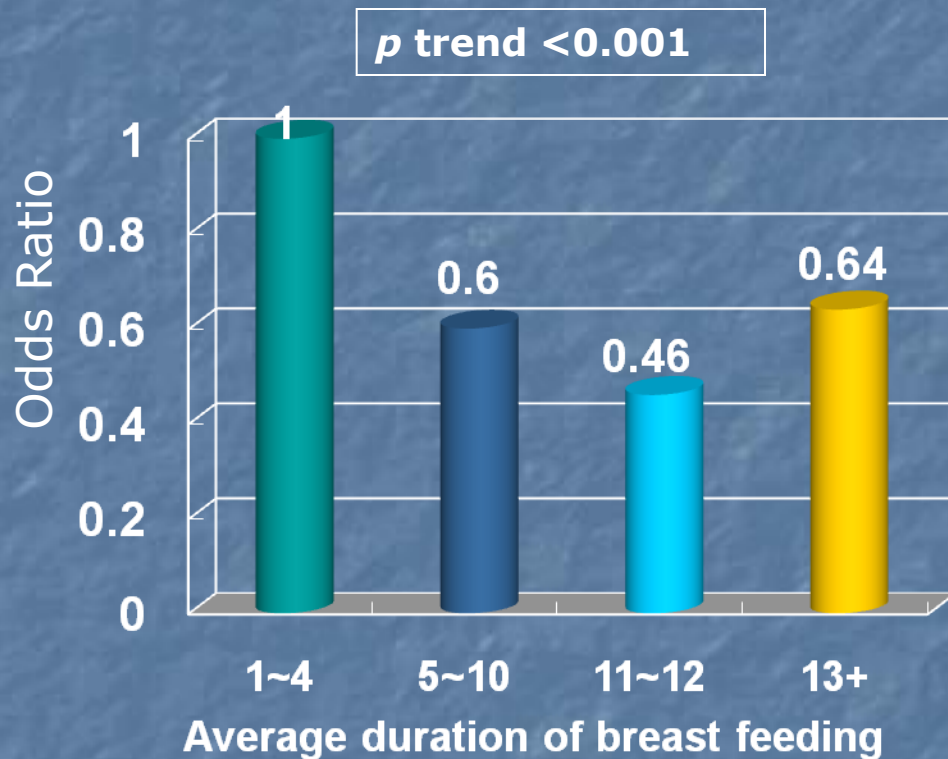
Adjusted for age, hospital, family history of breast cancer, BMI, menopausal status, age at menarche, number of live-birth, age at full-term pregnancy

Source: Kim et al. *Eur J Cancer Prev* 2007

Body Mass Index and Breast Cancer
Korea, 2004-2005

OR **Premenopausal**

p trend = 0.06

1.22
1.34

18.5-22.9   23.0-24.9   ≳25.0   kg/m²

OR **Postmenopausal**

p trend = 0.05

1.35
1.49

18.5-22.9   23.0-24.9   ≳25.0   kg/m²
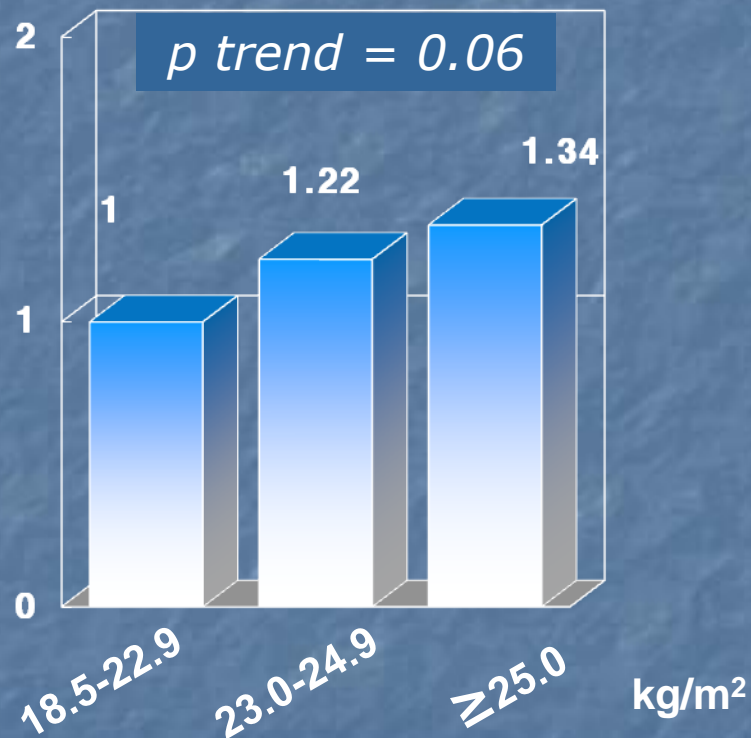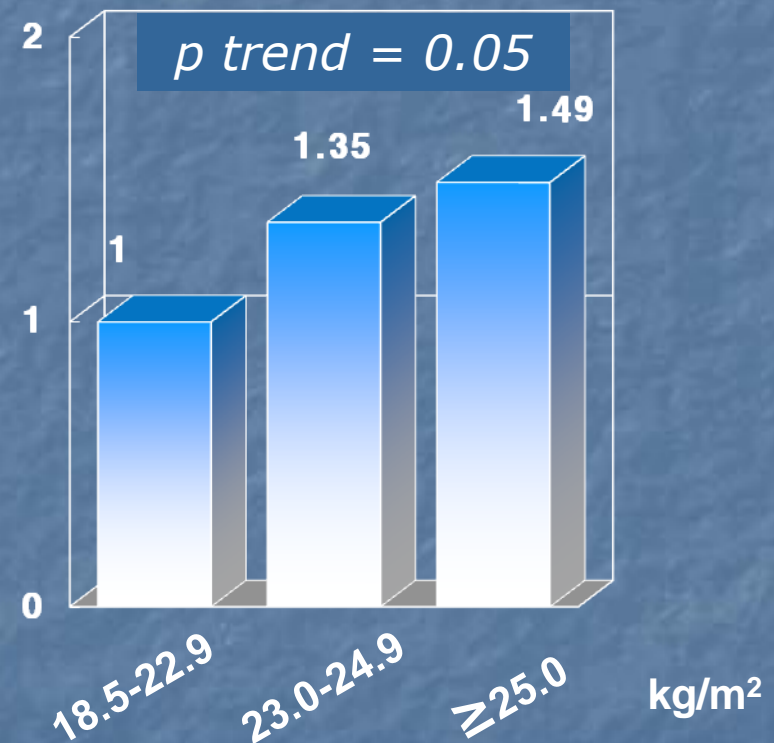
adjusted for age, hospital, family history of breast cancer, age at menarche, age at first full-term pregnancy, number of full-term pregnancy, history of hormone replacement therapy

Increase in High Fat Diet Correlates with Upsurge of Breast Cancer in Korea
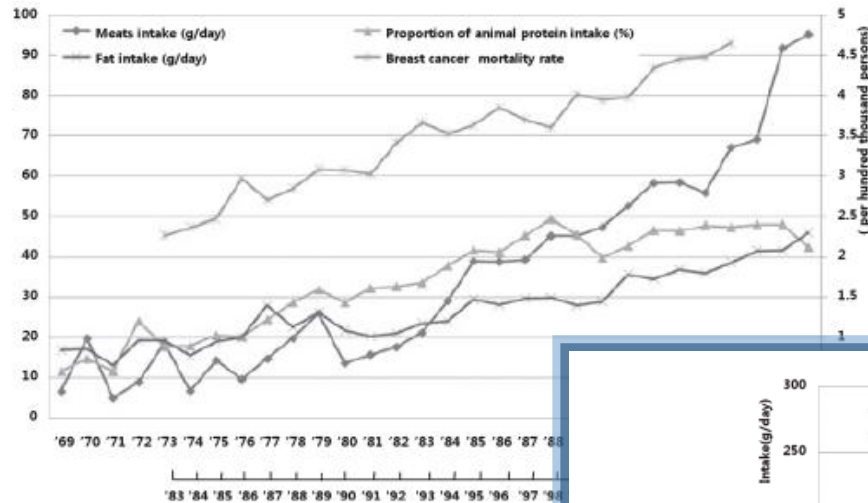
Figure 1. Trends of meat, fat, and animal protein intake, and age-standardized ... Korean National Health and Nutrition Examination Survey, KNSO: Korea National St...

Figure 2. Trends in total animal food intake and age-standardized mortality rates of breast cancer in Korea. The data were analyzed for a 10-year time lag. KNHANES: Korean National Health and Nutrition Examination Survey, KNSO: Korea National Statistical Office.

Kim et al. Breast J (accepted) 2010

Determinants of Age at Menarche
Community Survey in Yonchon County, Korea, n = 1,407

Determinants	Estimates[*]	S.E.	*p*
Height, current	−0.007	0.010	ns
Weight, current	−0.013	0.006	0.03
A.C., current	−0.014	0.004	0.00
H.C., current	−0.014	0.005	0.00
Weight, 20 years in age	−0.023	0.010	0.02
Weight, lifetime maximum	−0.015	0.007	0.02

* based on general linear model

HDL cholesterol and breast cancer
Case-control study, Korea, 2004-2005
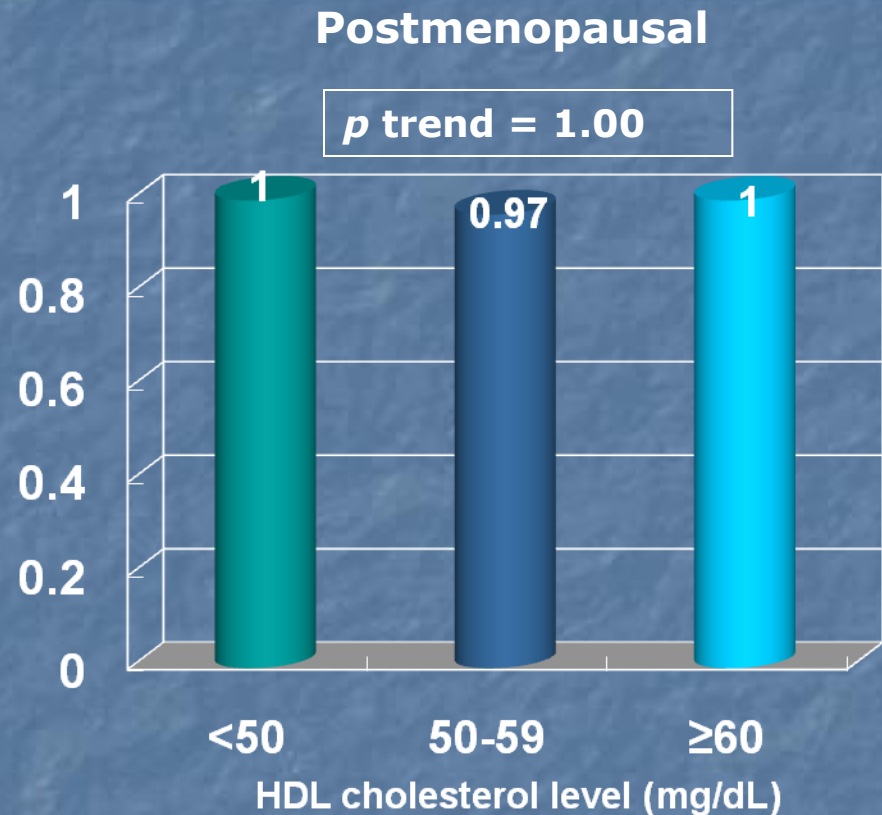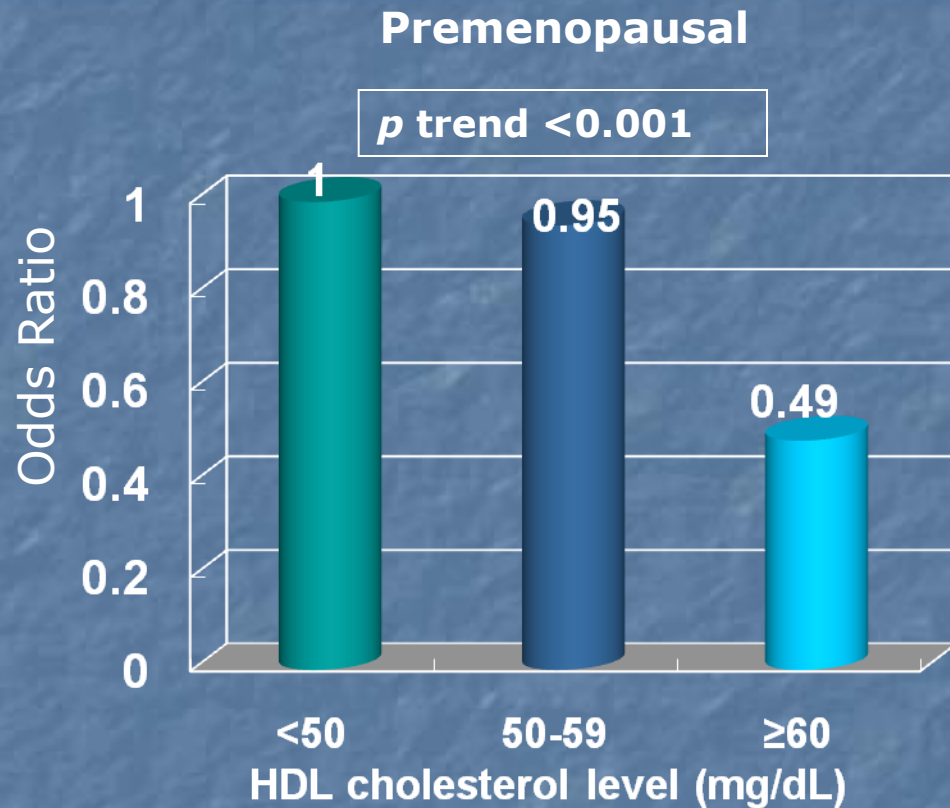
Adjusted for age, family history of breast cancer, BMI, age at menarche, age at full-term pregnancy, and total cholesterol

Kim et al. Cancer Epidemiol Biomarkers Prev 2009

Risk and Protective Factors of
Breast Cancer in Korean Women

- **established**
  - early menarche
  - late menopause
  - nulli-parity
  - later FFTP
  - family history
  - obesity (postmenopausal)
  - alcohol drinking
  - breast feeding
  - HRT

- **probable**
  - smoking
  - physical activity
  - NSAID use
  - oral contraceptives
  - ionizing radiation

Yoo et al.   Am J Epidemiol 1992
Yoo et al.   CCC 1993
Suh et al.   J Korean Med Sci 1996
Yoo et al.   Am J Epidemiol 1997
Yoo et al.   J Korean Med Sci 2002
Choi et al. BMC Cancer 2005
Kim et al.   Eur J Cancer Prev 2007

KOJACH: KOrea / JApan / CHina

Workshop of KOJACH-I, II Cooperative Studies on Cancer

Risk and Protective Factors for Breast and Colorectal Cancer

Beijing Guangxi Hotel,
Beijing, China
October 10th, 2008

Supported by
Grant-in-Aid for Scientific Research on
Special Priority Area, MEXT, Japan,
2000-2009

Benxi
Seoul
Nagoya
Chongqing
Nanjing

General information of KOJACH-I, II cooperative studies

Chairperson: Yoon-OK Ahn (Korea)

Progress report of KOJACH Study   K Tajima

KOJACH-I Study

Chairperson: K-Y Yoo(Korea), C-M Gao (China)

Risk factors for colorectal cancer in Japan   T Kawase & K Matsuo
Risk factors for colorectal cancer in Korea   D-H Kim & Y-O Ahn
Risk factors for colorectal cancer in Chongqing   Z-Y Zhou & J Cao

KOJACH-II Study

Chairperson: H Tanaka (Japan), J Cao (China)

Risk factors for breast cancer in Japan   K Matsuo & H Tanaka
Risk factors for breast cancer in Korea   S-K Park, Y-J Kim & K-Y Yoo
Risk factors for breast & colorectal cancer in Nanjing   J-H Ding & C-M Gao

Business Meeting   Chairperson: K Tajima (Japan)

Determinants of Upsurge of Breast Cancer in Young Asian Women

Korean women

    early menarche   (moderate - strong)

    postmenopausal obesity   (moderate)

    breast feeding   (strong)

    high fat diet   (strong)

Yoo et al. Earlier onset of age at menarche may be determined by body weight at age 20, and might be initiated by weight gain in her childhood. *Seoul J Med 1995*

Terry et al. Infant weight gain, in addition to childhood weight gain, may be associated with earlier age at menarche. *Am J Epidemiol 2009*
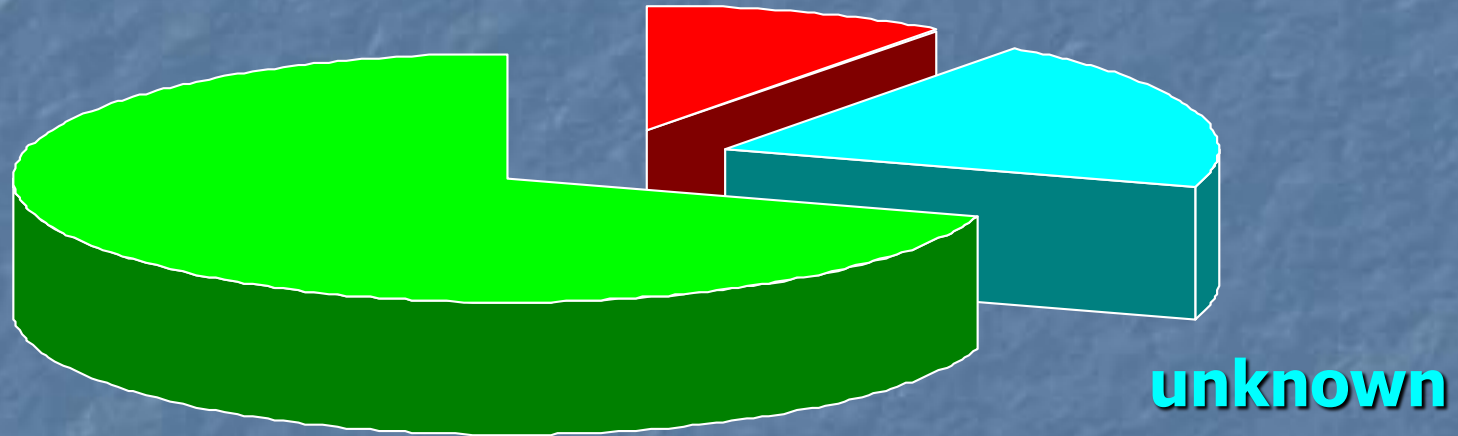
Genome Epidemiologic Studies on Breast Cancer at Seoul National University (since 2000)

GST M1/T1 & alcohol	Pharmacogenetics (2000)
COMT	Pharmacogenetics (2001)
XRCC1/3	Pharmacogenetics (2002), Breast Cancer Res Tr (2007)
GST & reproductive Factors	Breast Cancer Res Tr (2002)
CYP2E1/ALDH2	Pharmacogenetics (2003)
hOGG1	Breast Cancer Res Tr (2003)
Cytochrome P450-19/1B1/1Aa	Br J Cancer (2003), Exp Mol Med (2006)
ER-alpha	Breast Cancer Res Tr (2003)
TGF-β1 & TNF-β	Breast Cancer Res Tr (2005)
ATM	CEBP (2005)
SULT1A1 & SULT1E1	CEBP (2005)
ERCC2 / ERCC4	Exp Mol Med (2005)
IL-1β & IL-1RN	Breast Cancer Res Tr (2006)
eNOS, hormone receptor	Breast Cancer Res Tr (2006)
HIF 1-A	Clinica Chimica Acta (2008)
DNA repair genes	Asian Pacific J Cancer Prev (2008)
Innate immunity genes	Carcinogenesis (2009)
common SNiPs	J Natl Cancer Inst (2006)
CASP8	Nature Genetics (2007)
Genome-wide Association	Nature (2007)
XRCC3 Thr241Met	Breast Cancer Res Tr (2007)
Five SNiPs	CEBP (2008)

Breast Cancer Association Consortium

Survivorship

2ⁿᵈ Term Ten-year Plan for National Cancer Control in Korea (2006-15)

Incidence ↓   Mortality ↓   Survival ↑

Cancer Control Program

Primary Prevention

Early Detection

Quality of Life

Supportive & Palliative Care

Diagnosis & Treatment

Capacity Building

Education & Public Campaign

Cancer Registry & Surveillance

Resources

Understand cancer biology/pathology

Develop diagnosis & treatment

Provide evidence for policy-makers

Research   Basic (Cohort) / Translational / Clinical / Policy

Breast cancer screening guideline
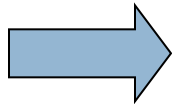
Age ≥ 40 → **Mammography
Clinical breast examination**   **Every 2 years**
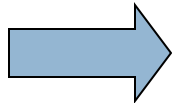
**Age
30~39** → **Self breast examination**   **Every months**

Life-time Screening Rates of Cancer
All Combined, Korea

unit: %

Cancers	2004	2005	2006	2007
Stomach	52.0	48.5	53.5	55.3
Liver	31.8	47.7	58.3	57.6
Colon	25.3	27.9	34.0	40.7
Breast	**55.9**	**57.4**	**60.2**	**66.4**
U. cervix	76.8	74.0	68.0	73.6

Source: National Cancer Center. Nationwide Survey for Health Screening Performance Rate, 2004~2007

Note: Proportion of person who has ever taken at least a cancer screening by the given year under the screening guideline recommended by the National Cancer Center and the Ministry of Health & Welfare

보건복지가족부
MINISTRY FOR HEALTH, WELFARE AND FAMILY AFFAIRS

국립암센터

Five Year Survival of Cancer Sites of National Screening Program
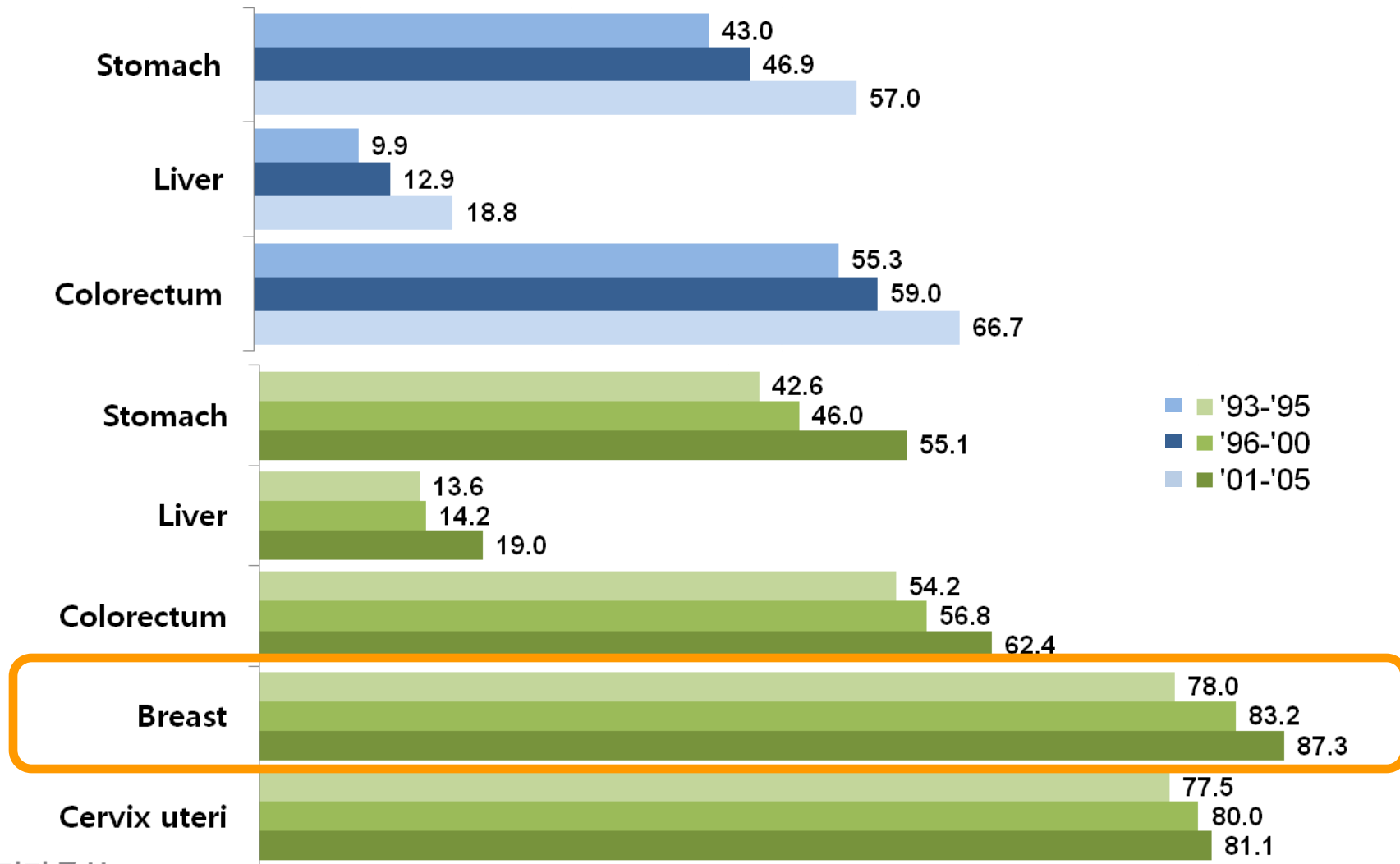
International Comparison of Five Year Relative survival

(Unit: %)

	Korea ('01-'05)	USA [1] ('96-'04)	Japan [2] ('97-'99)	Eurocare [2] ('95-'99)
Stomach	56.4	24.7	62.1	24.1
Lung	15.5	15.2	25.6	12.6
Colorectum	64.8	64.4	65.2	53.5
Liver	18.9	11.7	23.1	8.6
Thyroid	98.1	96.9	92.4	86.5
Breast	**87.3**	**88.7**	**85.5**	**81.1**
Cervix uteri	81.1	71.2	71.5	66.5
Prostate	76.9	98.9	75.5	77.0
All Cancers	52.2	65.3	54.3	51.9

1) Ries LAG, et al (eds). SEER Cancer Statistics Review, 1975-2005, National Cancer Institute, 2008
2) National Cancer Center in Japan. Cancer Statistics in Japan, 2008

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국립암센터

Stage Frequency of Breast Cancer
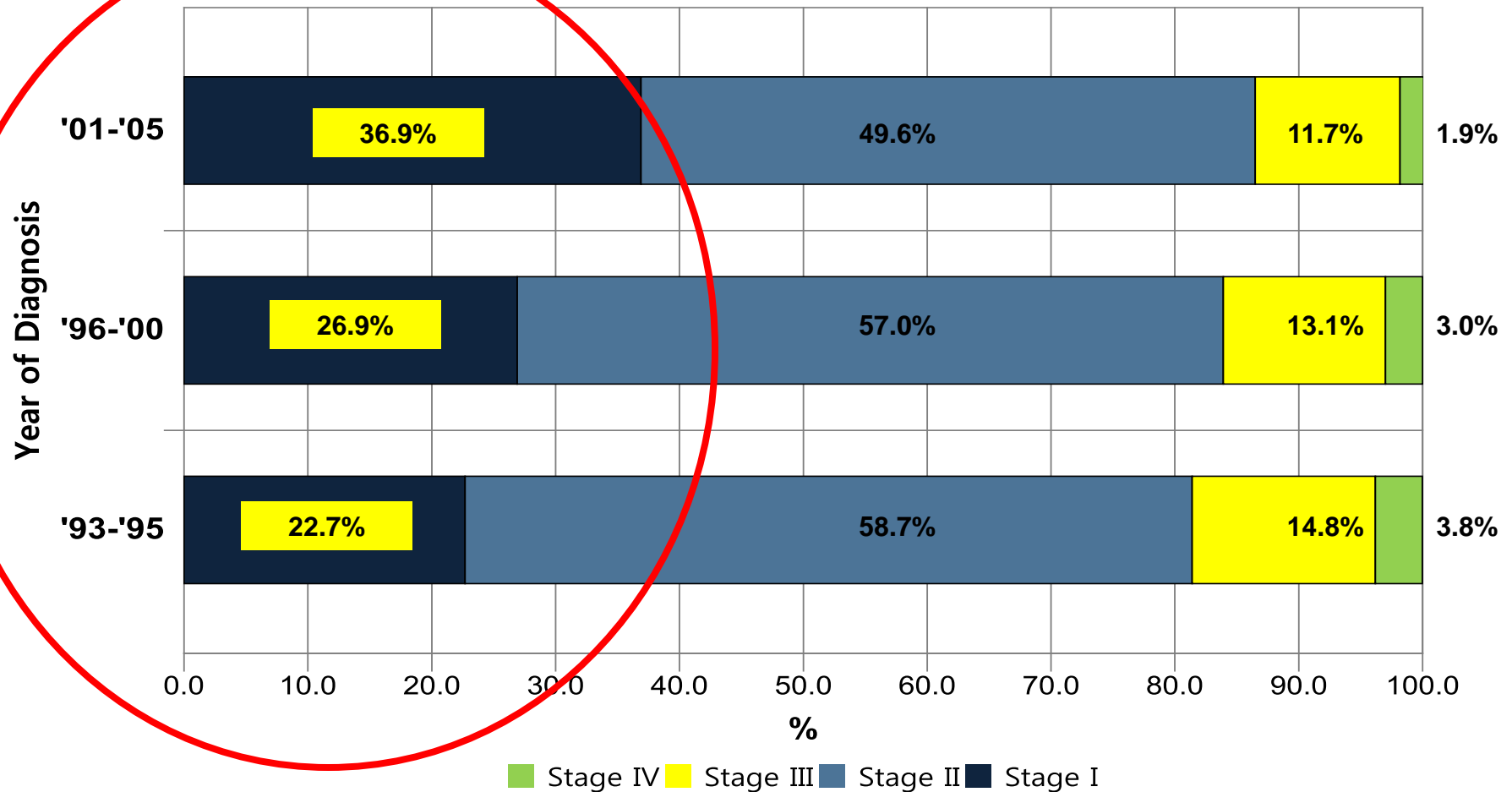
Source: Korea Central Cancer Registry,
Korean Breast Cancer Society

Breast Cancer in Korea, Today

United States
  War against Cancer, 1971
  Decline in cancer mortality, 1991

Japan
  NCCP, 1965
  NCSP for breast cancer, 1987

Korea
  1st NCCP, 1996
  1st NCSP for BC, 1999
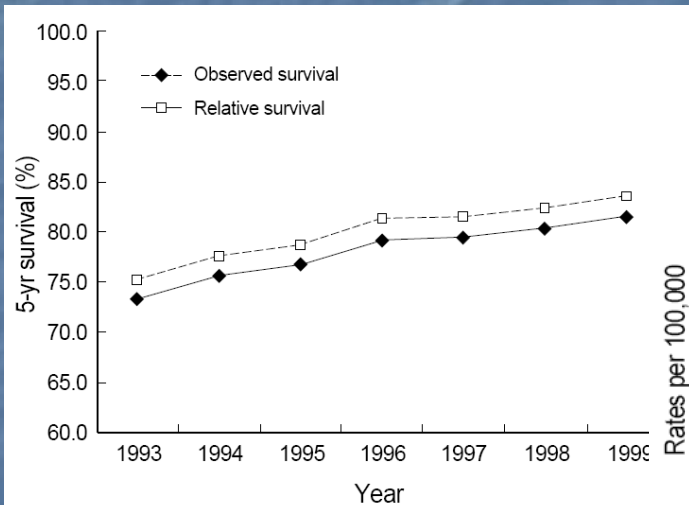
5YSR, Breast Cancer,
1993-1999
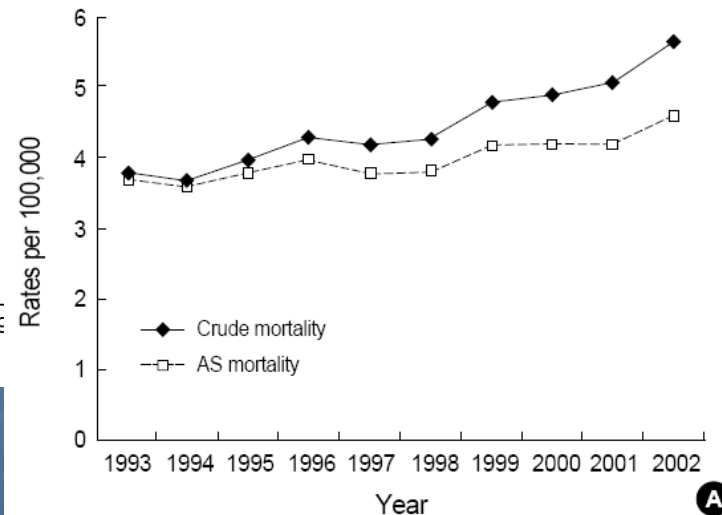
Mortality, Breast Cancer,
1993-2002
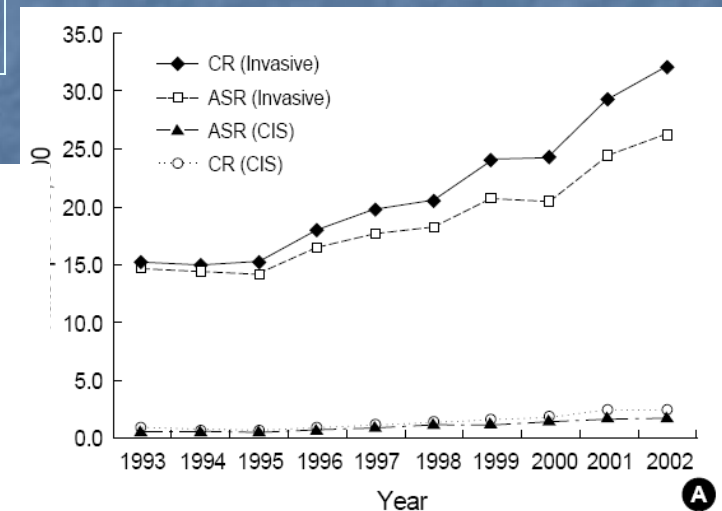
Incidence, Breast Cancer,
1993-2002

Developing Countries, Today...

- mainly poverty-related tumors (cervical, esophagus, liver)

- tumors linked to western style of life
  (breast, lung, prostate, colorectal)

- lack of primary and secondary prevention

- lack of resources for treatment

Cavalli F. Nature Clinical Practice Oncology, 11:582; 2006

Epidemiology of BC in Indonesia

BC in younger women showed aggressive phynotype
  larger tumor size, more LN, higher c-erbB2 / p53
  higher ER/PR expression

More common adjuvant chemotherapy,
  higher recurrence, metastasis, and death

Figure 1. Clinical Stages of Breast Cancers in Patients Aged < 40 Years (left) and ≥ 60 Years Old (right)

Table 1. Characteristics of Operable Breast Cancer Cases in Patients Aged <40 years old

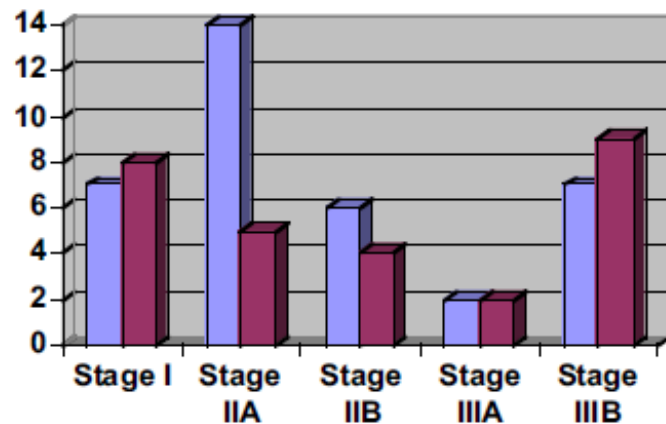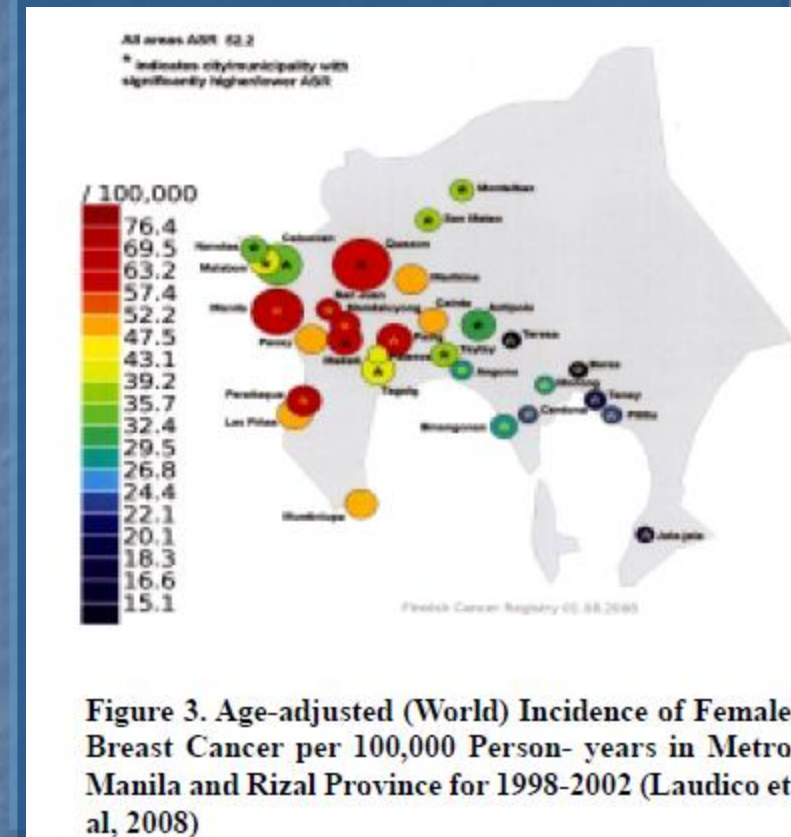| Variables	n	%	Total (%)	5-year survival (%)
Lymph node			36 (78.3)	
Negative	12	33.3		81.8
1-3	8	22.3		58.3
≥ 4	16	44.4		33.3
Lymph node			36 (78.3)	
Positive	24	66.7		42.2
Negative	12	33.3		81.8
Tumor size			36 (78.3)	
0-2	7	19.5		100
> 2 – 5	20	55.5		59.2
> 5 cm	9	25.0		16.7
Tumor size			36 (78.3)	
> 2 cm	29	80.5		44.6
0- 2 cm	7	19.5		100
Grade			45 (97.8)	
Low	1	2.4		0
Intermediate	22	48.8		58.3
High	22	48.8		55.3
ER			46 (100)	
Negative	17	37.0		43.8
Positive	29	63.0		61.9
PR			45 (97.8)	
Negative	22	48.9		35.7
Positive	23	51.1		61.9
p53			42 (91.3)	
Positive	38	90.4		53.2
Negative	4	9.6		100
MIB-1 proliferation index			38 (82.6)	
Positive	38	100		56.5
Negative	-	-		-
c-erbB2			43 (93.5)	
Positive	32	74.4		52.0
Negative	11	25.6		74.1
Mitotic Index			45 (97.8)	
Low	2	4.6		50.0
Intermediate	17	37.7		90.0
High	26	57.7		34.6
Adjuvant chemotherapy			39 (84.8)	
Yes	25	64.1		47.0
No	14	35.9		72.7
Adjuvant tamoxifen			35 (76.1)	
No	4	11.5		100
Yes	31	88.5		55.0
Death			46 (100)	
Death	14	30.4		55.1
Alive	23	50.0		
Unknown	9	19.6		
Recurrence			38 (82.6)	
Yes	3	7.9		33.3
No	35	92.1		60.1
Metastasis			38 (82.6)	
Yes	11	25.0		24.2
No	27	75.0		71.1

Table 2. Characteristics of Operable Breast Cancer Cases in Patients Aged ≥60 years old

Variables	n	%	Total (%)	5-year survival (%)
Lymph node			37 (77.1)	
Negative	15	40.5		87.5
1-3	15	40.5		51.3
≥ 4	7	19.0		0
Lymph node			37 (77.1)	
Positive	22	59.5		33.2
Negative	15	40.5		87.5
Tumor size			39 (81.3)	
0-2	5	12.8		75.0
> 2 – 5	26	66.6		63.6
> 5 cm	8	21.6		0
Tumor size			39 (81.3)	
> 2 cm	34	79.4		48.7
0- 2 cm	5	21.6		75.0
Grade			43 (89.6)	
Low	2	4.6		0
Intermediate	18	41.9		81.8
High	23	53.5		47.7
ER			46 (95.8)	
Negative	23	50.0		32.6
Positive	23	50.0		73.9
PR			44 (91.7)	
Negative	24	54.5		51.2
Positive	20	45.5		64.8
p53			34 (70.8)	
Positive	4	11.8		66.7
Negative	30	88.2		56.7
MIB-1 proliferation index			33 (68.8)	
Positive	6	18.2		66.7
Negative	27	81.8		58.2
c-erbB2			38 (79.2)	
Positive	21	55.3		44.9
Negative	17	44.7		71.1
Mitotic Index			39 (81.3)	
Low	1	2.5		100
Intermediate	10	25.6		58.3
High	28	71.9		65.6
Adjuvant chemotherapy			27 (56.3)	
Yes	6	22.2		58.5
No	21	77.8		66.7
Adjuvant tamoxifen			34 (70.8)	
No	7	20.5		66.7
Yes	27	79.5		57.8
Death			48 (100)	
Death	10	20.8		56.8
Alive	24	50.0		
Unknown	14	29.2		
Recurrence			35 (72.9)	
Yes	2	5.7		0
No	33	94.3		59.7
Metastasis			35 (72.9)	
Yes	8	22.8		28.1
No	27	77.2		74.1

Aryandono et al. Asian Pacific J Cancer Prev 2006

Epidemiology of BC in Philippines

the highest in Asia
rapid increase during 1980-2002
higher in cities than municipalities
decreasing fertility
westernization of lifestyle

AJCC I (5%) IIA(20%) IIB(18%)
5-ysr = 58.6%

Figure 3. Age-adjusted (World) Incidence of Female Breast Cancer per 100,000 Person- years in Metro Manila and Rizal Province for 1998-2002 (Laudico et al, 2008)

Laudico et al. Asian Pacific J Cancer Prev 2009

Epidemiology of BC in Tehran, Iran

the 2nd most common cancer
ASIR = 17.09 / 100,000
31% of newly diagnosed BC: under 40 years old
mean age = 51.3 years

higher education
late menopause / more FTP / longer lactation
1st-degree family history
higher BMI

Table 1. Incidence rate of Breast Cancer per 100.000 Population from 1998-2001 by Age Group

| Age Group	1998	1999	2000	2001	Overall
15-19	0.00	0.00	0.18	0.00	0.09
20-24	0.84	1.04	1.45	0.82	0.99
25-29	5.40	5.08	5.88	5.00	5.27
30-34	14.45	13.66	17.95	12.09	14.53
35-39	33.96	26.62	35.41	24.19	30.11
40-44	51.81	50.54	56.90	42.99	50.43
45-49	68.36	60.22	72.76	55.99	64.44
50-54	72.63	66.24	81.03	56.46	68.87
55-59	76.35	63.52	87.39	65.49	73.18
60-64	90.50	75.33	74.72	68.89	77.30
65-69	74.06	51.48	65.65	46.29	59.30
70-74	47.54	49.13	64.83	46.45	53.32
75-79	60.91	45.36	59.99	71.38	59.46
80-84	27.56	36.50	54.30	53.84	40.87
85+	39.94	23.80	23.60	23.40	25.67
Total	18.19	15.90	19.51	14.76	17.09
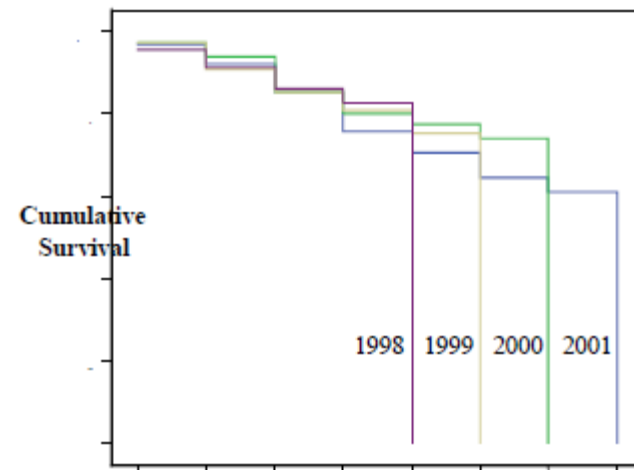
Figure 1. Survival Curves for Breast Cancer Cases in Tehran Cancer Registry from 1998-2001

Mousavi et al. Asian Pacific J Cancer Prev 2008
Naieni et al. Asian Pacific J Cancer Prev 2007

The breast that has never lactated is more liable to become cancerous (JE Lane-Claypon, 1926)

Cause of death = infections

Life expectancy <45 yrs

Per capita GNI < US$200

Traditional medicine

Cause of death = cancer

Life expectancy = 78 yrs

Per capita GNI = US$20,000

Universal health insurance

Janet Elizabeth Lane-Claypon

1911

2009

Female Breast Cancer (ICD C50) in selected countries of Asia

Source: CI5 IX