

Epidemiology of Cancer in Lebanon & Radiation Oncology Facilities

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The Lebanese Cancer Epidemiology Group

- Founded in 1998
- Network of all hospitals with oncology services and all pathology laboratories.
- To estimate incidence rates at the national level
- Collected all cases diagnosed in 1993, and for each 5-year interval thereafter (1998, 2003)

Cancer incidence in Lebanon

The total number of new cases

1993:	2,856
1998:	4,388
2003:	7,888

The 10 most common cancer sites

1993

Male (n=1469)

Bladder (18.6%)
 Lung (15.0%)
 Prostate (9.7%)
 Colo-rectal (8.7%)
 Larynx (7.0%)
 Stomach (4.6%)
 Non-Hodgkins (3.8%)
 Brain & nervous system (3.7%)
 Oro-pharyngeal (3.4%)
 Kidney & urinary tract (3.3%)

Female (n=1387)

Breast (38.6%)
 Colo-rectal (6.8%)
 Corpus uteri (6.6%)
 Ovary (4.8%)
 Cervix uteri (4.6%)
 Stomach (4.5%)
 Lung (3.2%)
 Bladder (3.1%)
 Brain & nervous system (2.8%)
 Non-Hodgkins (2.5%)

1998

Male (n=2296)

Bladder (18.5%)
 Prostate (14.2%)*
 Lung (14.1%)
 Colo-rectal (8.0%)
 Stomach (5.1%)
 Larynx (4.8%)[†]
 Brain & nervous system (3.9%)
 Kidney & urinary tract (2.7%)
 Non-Hodgkins (2.7%)[†]
 Oro-pharyngeal (2.6%)

Female (n=2092)

Breast (33.4%)[†]
 Colo-rectal (8.7%)
 Corpus uteri (4.8%)[†]
 Ovary (4.3%)
 Bladder (4.3%)
 Lung (4.3%)
 Cervix uteri (4.2%)
 Brain & nervous system (3.9%)
 Stomach (3.6%)
 Thyroid (3.3%)

Cancer incidence 1993 and 1998

The 10 most common sites

- **Bladder cancer for males and breast cancer for females were the most common malignancies in both years**
- **Among males, the proportion of prostate cancer increased from 9.7% in 1993 to 14.2% in 1998, replacing lung cancer as the 2nd most common ca.**
- **In both years of the study, colorectal cancer ranked 4th among males and 2nd in females**
- **Non-Hodgkin's lymphoma in females in 1993 was replaced, in 1998, by thyroid as one of the 10 most common cancer**

Cancer incidence 1993 and 1998

Crude Incidence

1993

Males **91.7 per 100,000**

Females **84.4 per 100,000**

1998

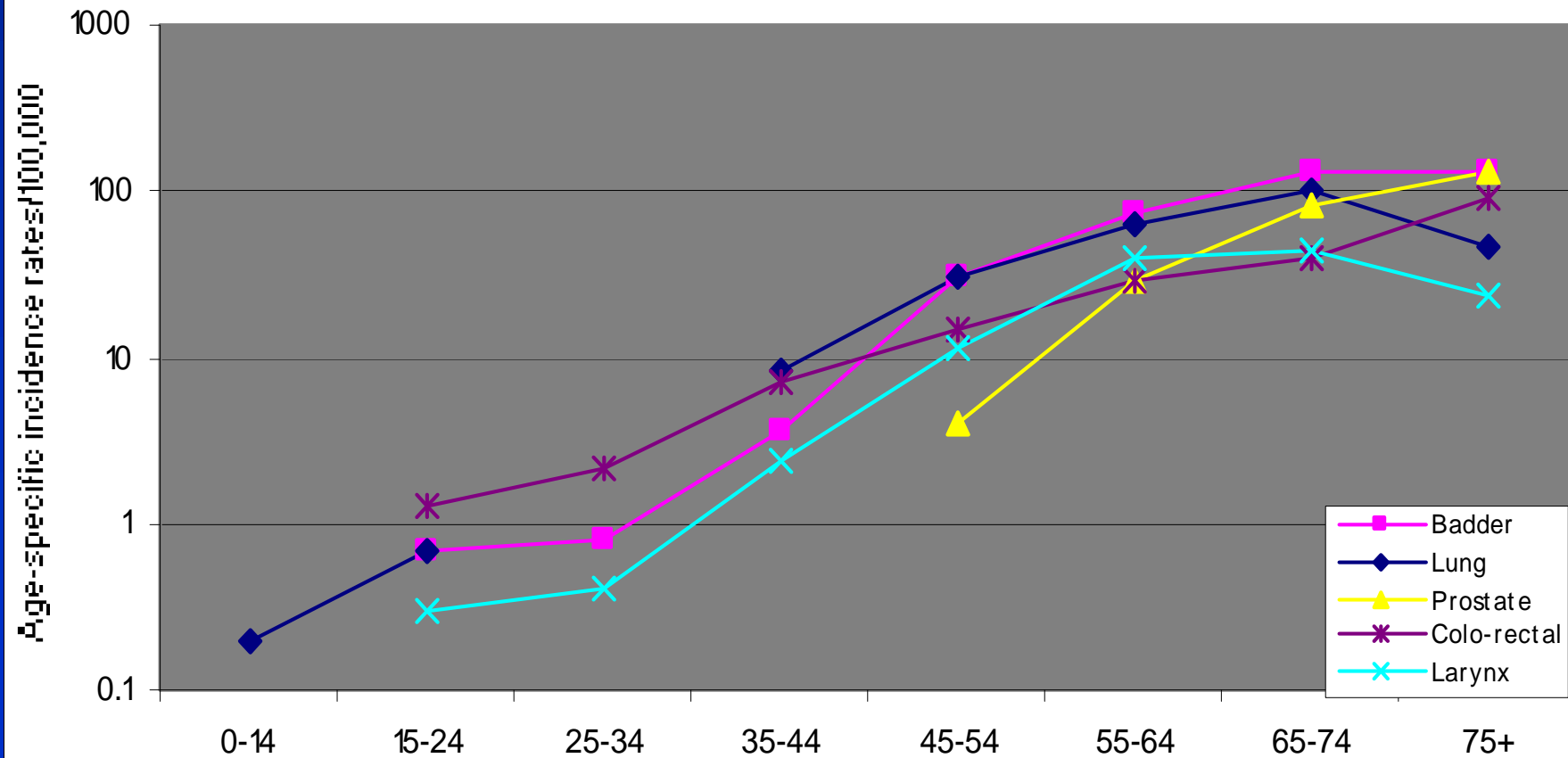
Males **117.9 per 100,000**

Females **105.3 per 100,000**

Age specific incidence rates: 1993

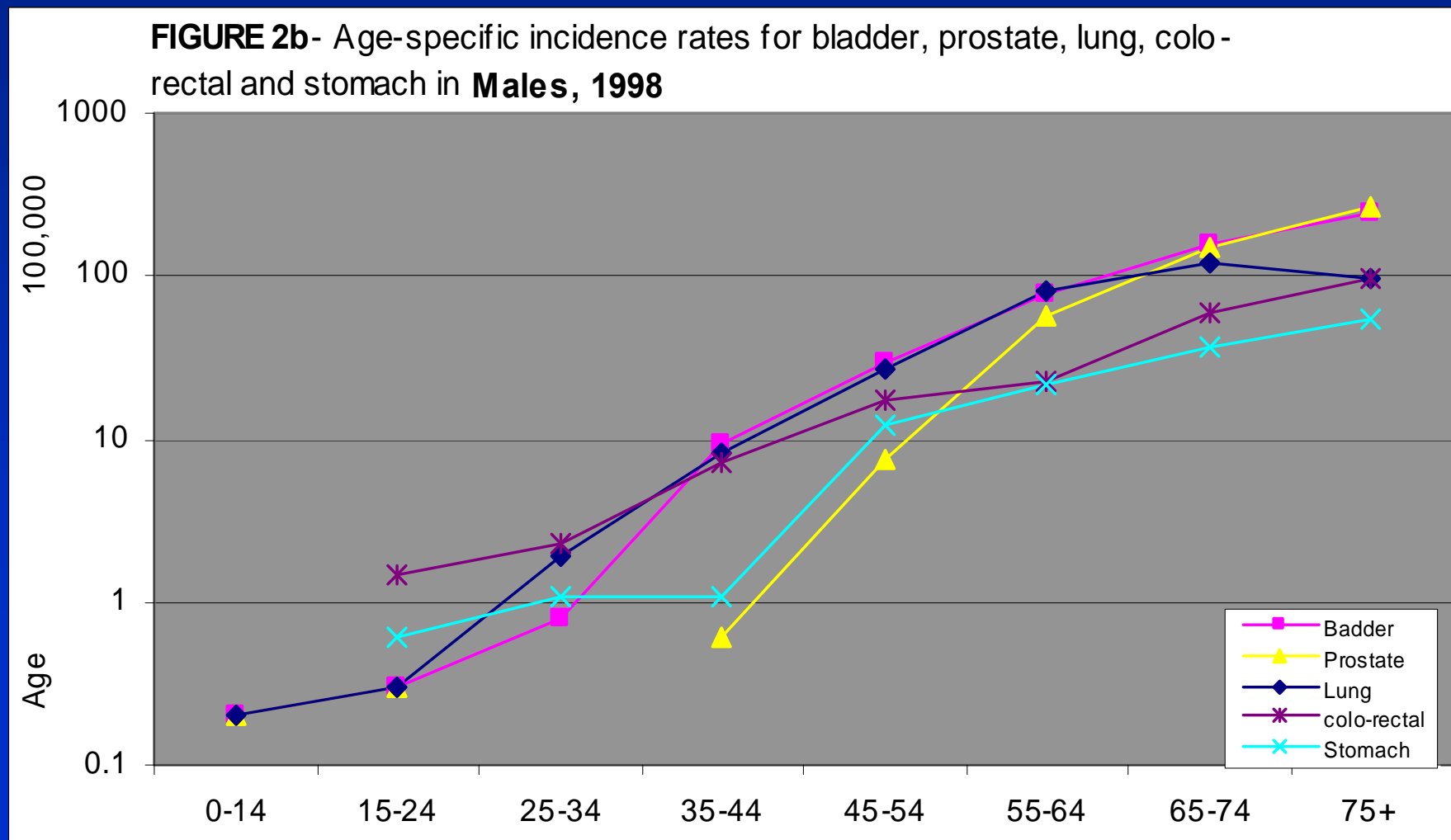
Males

FIGURE 2a- Age-specific incidence rates for bladder, lung, prostate, colo-rectal and larynx in **Males, 1993**



Age specific incidence rates: 1998

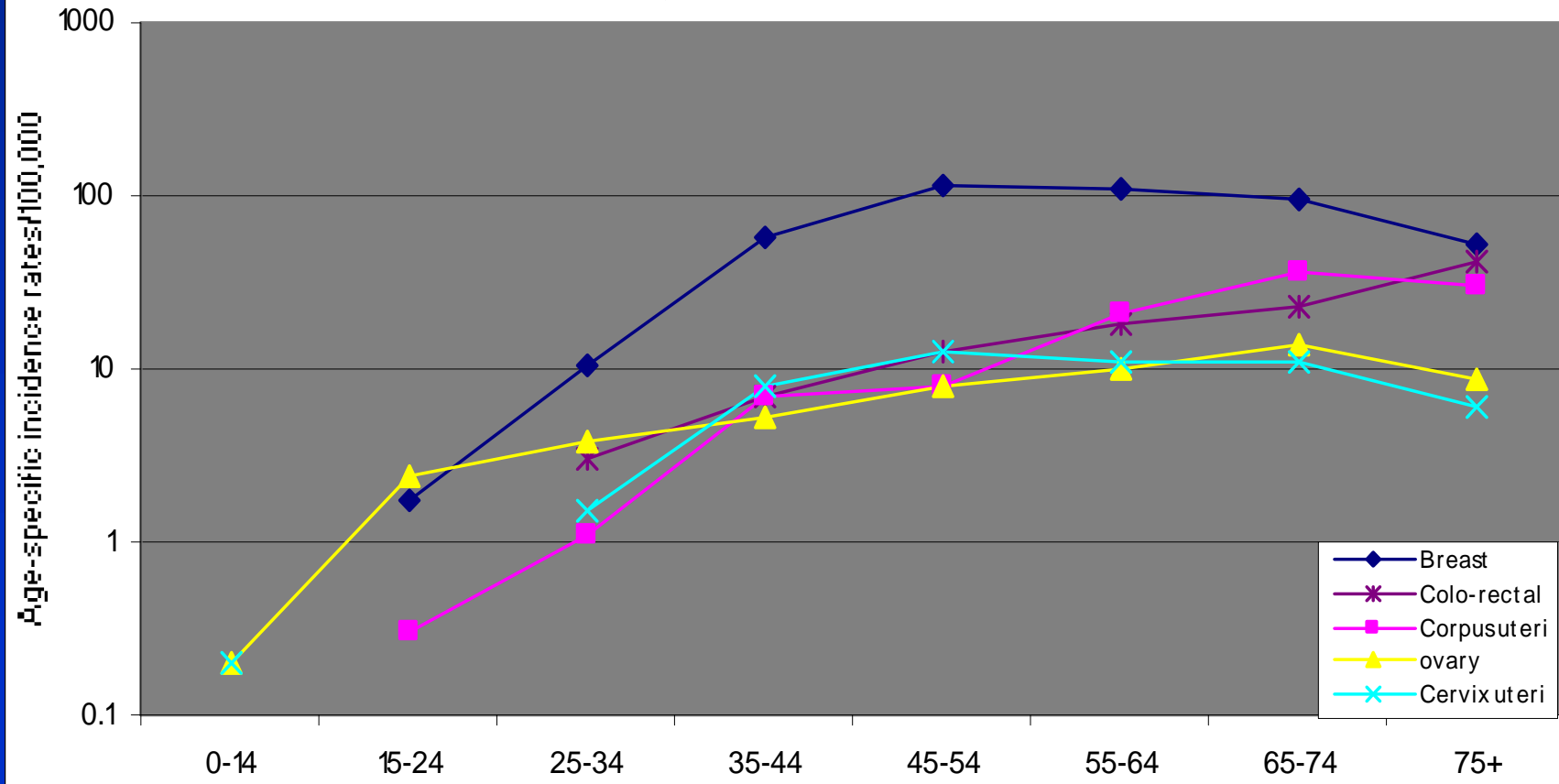
Males



Age specific incidence rates:1993

Females

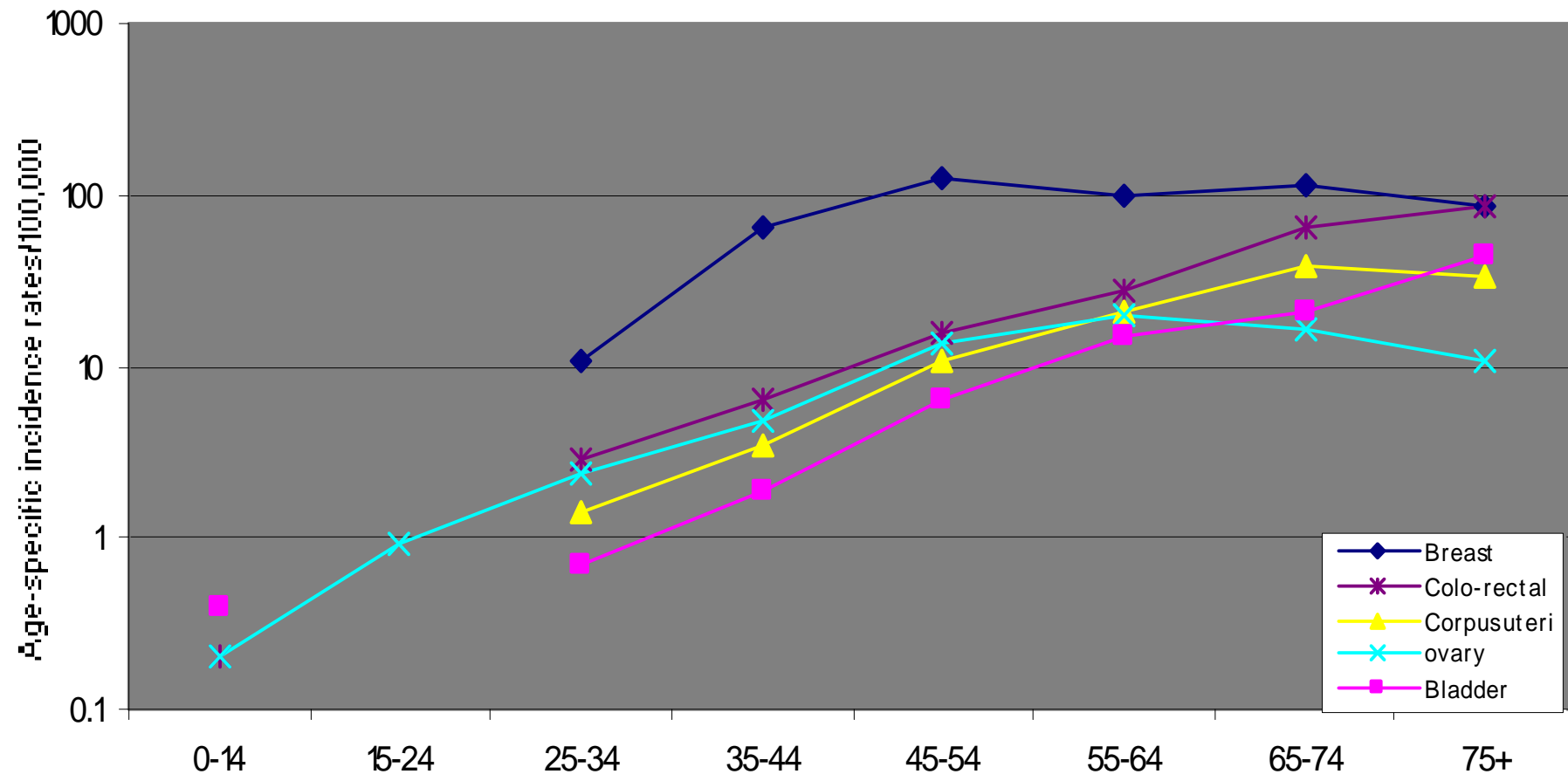
FIGURE 3a- Age-specific incidence rates for breast, colo-rectal, corpus-uteri, ovary and cervix uteri in **Females, 1993**



Age specific incidence rates: 1998

Females

FIGURE 3b- Age-specific incidence rates for breast, colo-rectal, corpus uteri, ovary and bladder in **Females, 1998**



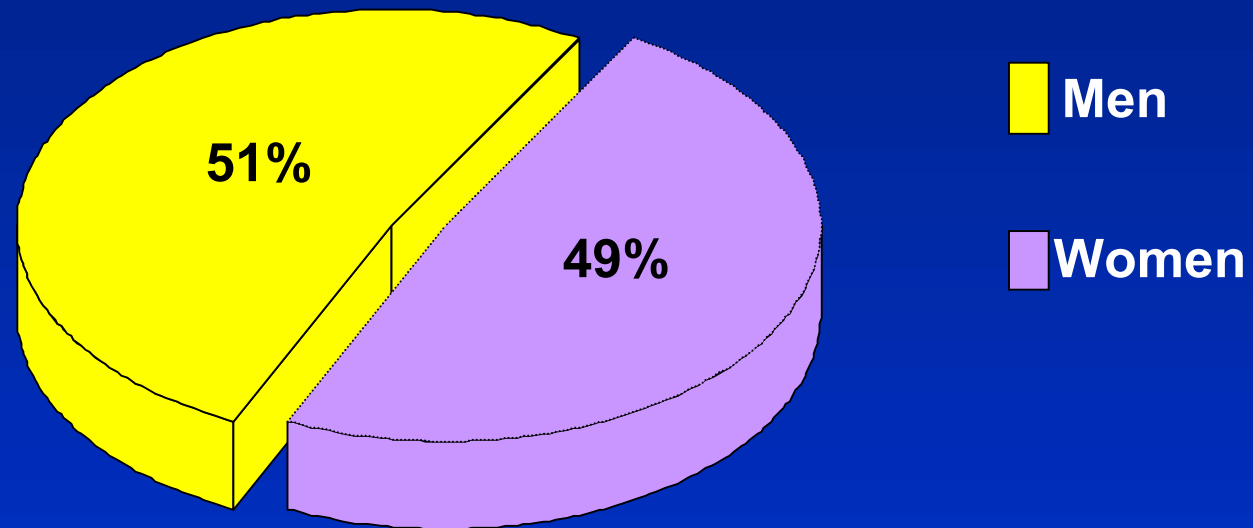
Cancer incidence 1993 and 1998

Bladder Cancer

- **Incidence rates in Lebanon are high, in particular among males. Incidence rates parallel those observed in developed countries such France, the USA, UK and Israel.**
- **Rates have always been this high in national studies and hospital-based registries in the country (1962, 1966, 1992, 1998)**
- **Tobacco smoking**
- **Exposures to paint components, polycyclic aromatic hydrocarbons, diesel exhausts, and aromatic amines**
- **No bilharsia in Lebanon (Egypt, Iraq)**

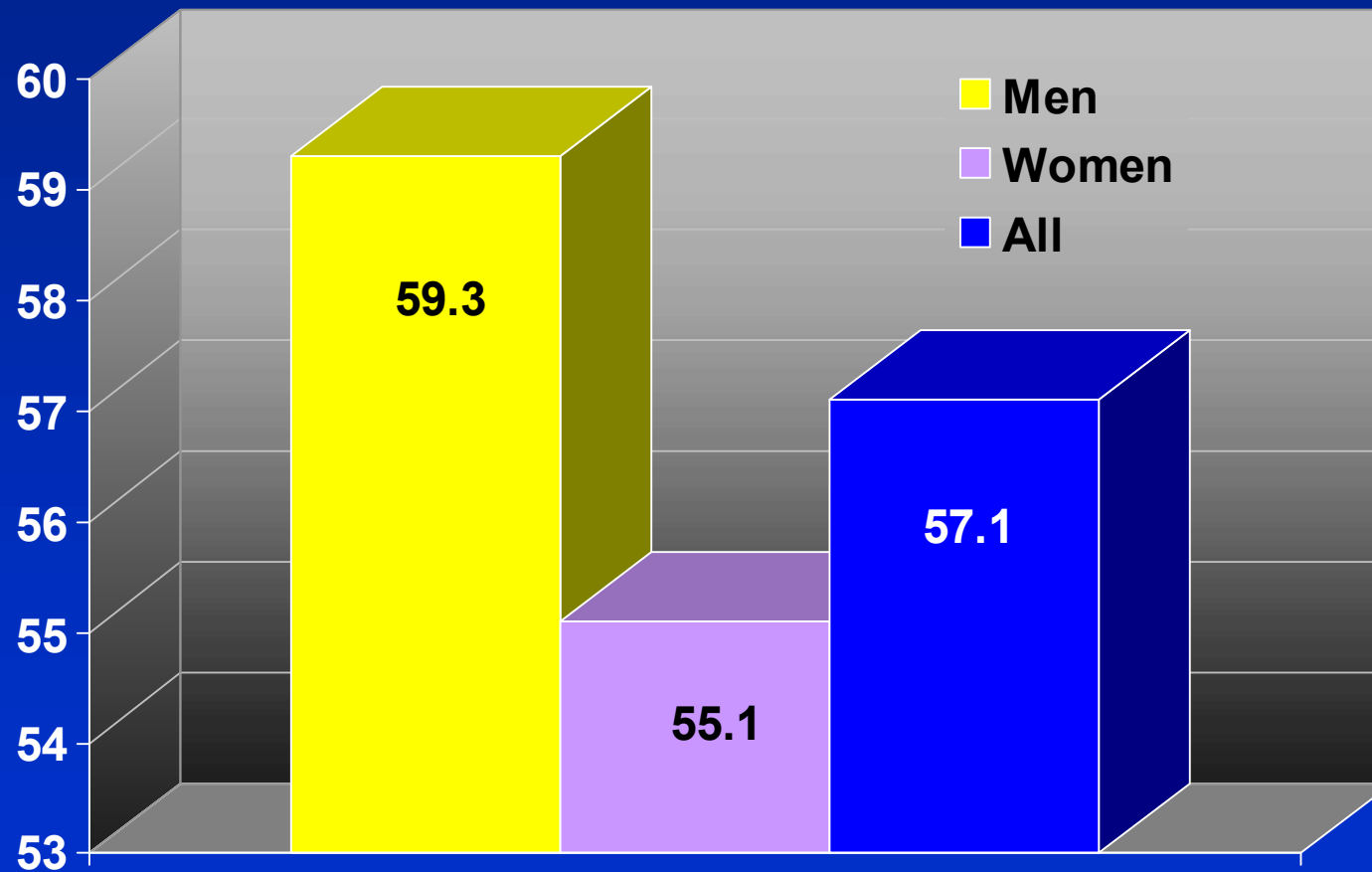
Cancer incidence in Lebanon: 2003

GENDER



7,888 cases

Mean age in years by Gender : 2003



The 10 most common cancer sites

1998

Male (n=2296)

Bladder (18.5%)
 Prostate (14.2%)*
 Lung (14.1%)
 Colo-rectal (8.0%)
 Stomach (5.1%)
 Larynx (4.8%)[†]
 Brain & nervous system (3.9%)
 Kidney & urinary tract (2.7%)
 Non-Hodgkins (2.7%)[‡]
 Oro-pharyngeal(2.6%)

Female (n=2092)

Breast (33.4%)[†]
 Colo-rectal (8.7%)
 Corpus uteri (4.8%)[‡]
 Ovary (4.3%)
 Bladder (4.3%)
 Lung (4.3%)
 Cervix uteri (4.2%)
 Brain & nervous system (3.9%)
 Stomach (3.6%)
 Thyroid (3.3%)

2003

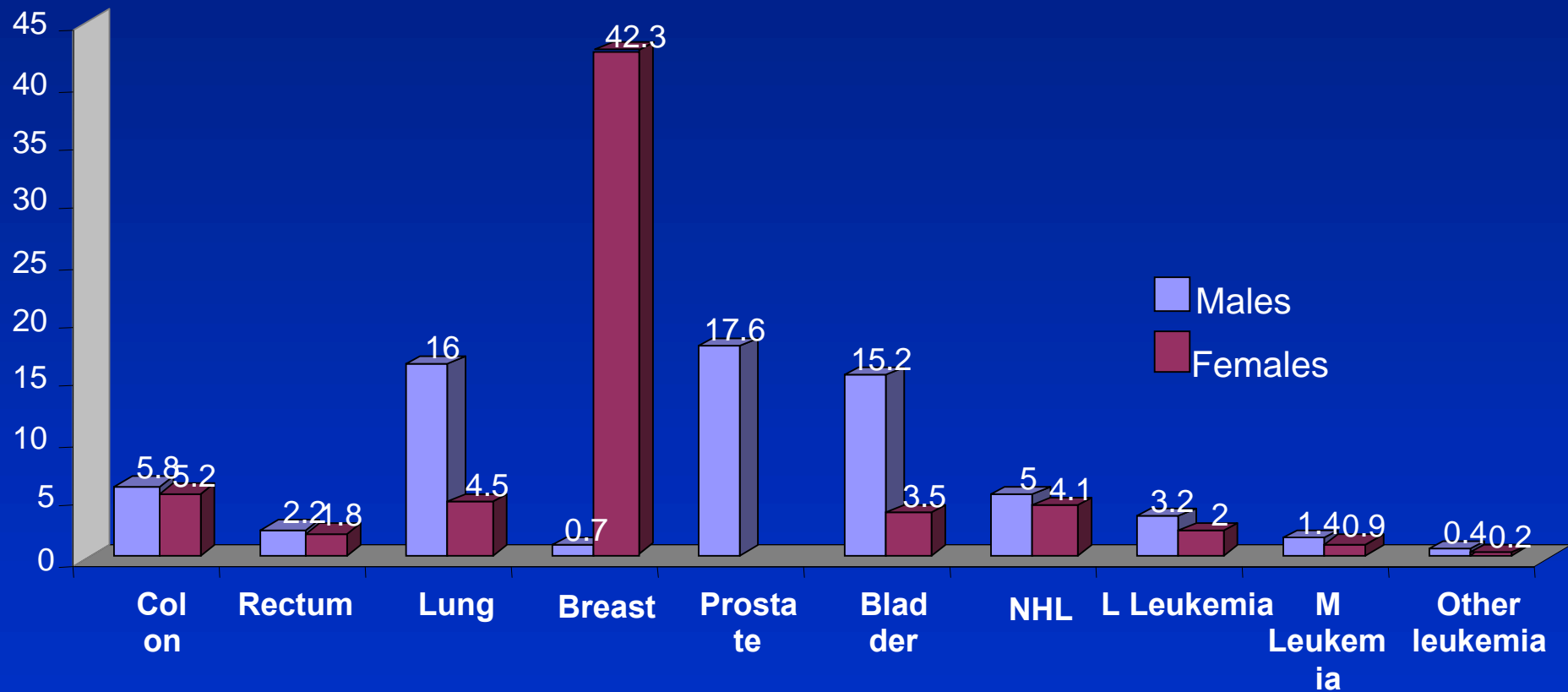
Male (n=3841)

Prostate (17.6%)
 Lung (16%)
 Bladder (15.2%)
 Colo-rectal (8%)
 Non-Hodgkins (5%)
 Leukemia (3.2%)
 Stomach (3.2%)
 Larynx(2.8%)
 Multiple Myeloma (2.4%)
 Testis (2.2%)

Female (n=4047)

Breast (42.3%)
 Colo-rectal (7.4%)
 Ovary (4.7%)
 Lung (4.5%)
 Non-Hodgkins (4.1%)
 Bladder(3.5%)
 Corpus Uteri (2.8%)
 Thyroid (2.4%)
 Cervix uteri(2.3%)
 Leukemia (2%)

Relative frequency of cancer sites by gender: 2003

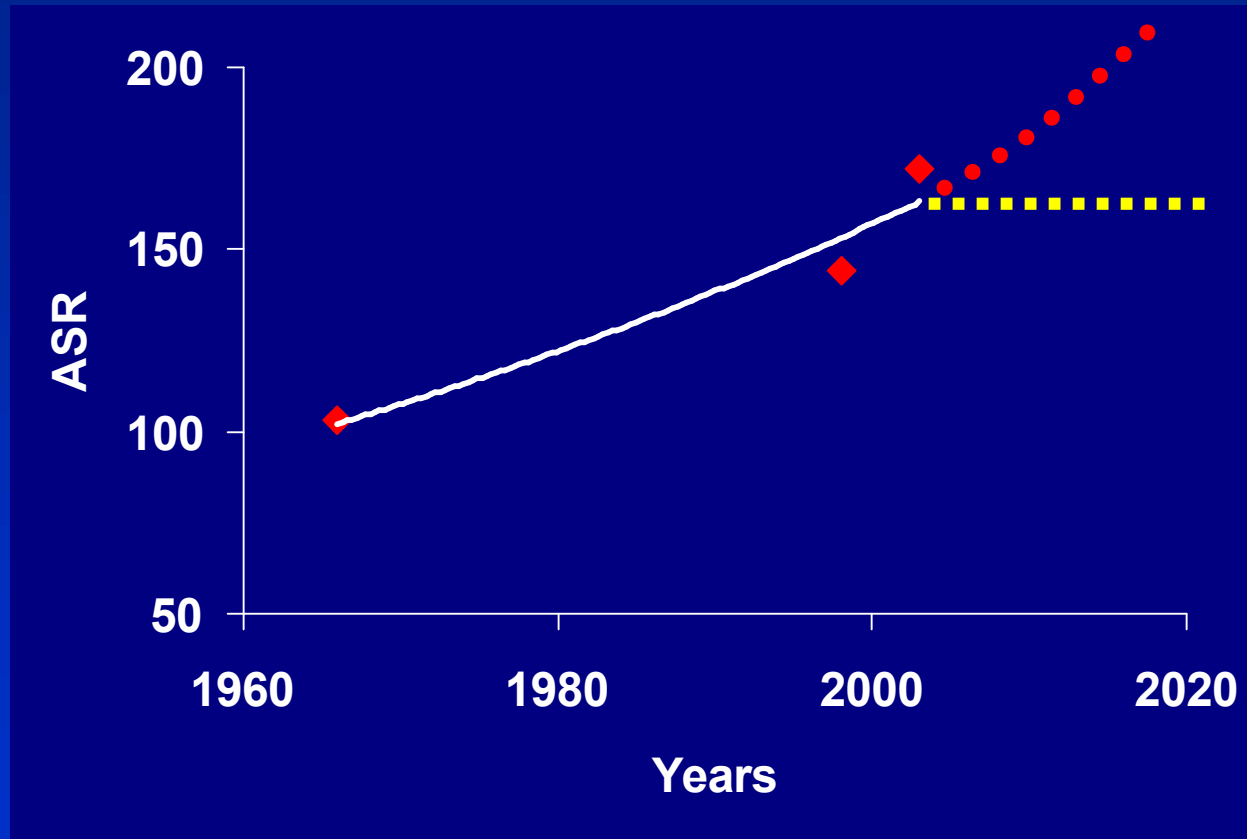


Change in Incidence rates

Age Standardized Rates

ASR	1966	1998	2003
Males	102.8	154.2	169.34
Females	104.1	134.8	176.81

Change in incidence rates



Possible causes for the increase in crude incidence rates

- **Improvement in detection rate**
- **Improved reporting and data collection**
- **Duplication**
- **Proliferation of health care institutions and modern diagnostic tools and technologies**
- **Increased number of oncology care specialists**
- **Development of awareness campaigns and screening programs**
- **A true increase in incidence**

Radiation Oncology Facilities in Lebanon

- < 1997: 3 centers (one outside Beirut)
- 1997: 5 centers (1 outside Beirut)
- 1999: 6 centers (2 outside Beirut)
- 2002: 7 centers (3 outside Beirut)
- 2004: 8 centers
- 2007: 8 centers (2 outside Beirut)

Radiation Oncology Facilities in Lebanon

- < 1997: 4 Cobalt machines
- 1997: 7 Linacs, 3 Cobalts
- 1999: 8 Linacs, 2 Cobalts
- 2002: 9 Linacs, 2 Cobalts
- 2004: 12 Linacs, 2 Cobalts
- 2006: 11 Linacs, 2 Cobalts
- 2007: 11 Linacs, 2 Cobalts

Radiation Oncology Services in Lebanon

- TPS 8 centers
- 3D 8 centers
- LDR brachytherapy 1 center
- HDR brachytherapy 1 center
- SRS/SRT 1 center
- IMRT 0

Radiation Oncology at AUB



Radiation Oncology at AUB

Simulator Room



Radiation Oncology at AUB

Low Energy Linac



Radiation Oncology at AUB

High Energy Linac



Radiation Oncology at AUB

Linac control area



Stereotactic Radiosurgery



Radiation Oncology at AUB

HDR Brachytherapy



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