

1214

POSTER

# On the avoidability of breast cancer in western societies: older age at first birth as an indicator of excess of breast cancer cases

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**Objective:** We examined the association between the proportional excess of breast cancer and previous age of mother at first birth, a major and consistent risk indicator for breast cancer at population level.

**Method:** Incidence of breast cancer in 34 industrialized countries with more than 1 million inhabitants was obtained from the GLOBOCAN 2002 and SEER databases. Data on age of mother at first birth was collected through national statistics offices. National relative excess risk (RER) was calculated by subtracting the lowest age-specific incidence rate from the rate in each population. Finally, we compared numbers of breast cases in 2002 calculated based on the observed correlation coefficient of RER in 2002 and mean age at first child in 1972 with the number of cases attributable to the average change in age at first child in the last 30 years.

**Results:** The national RER in 2002 correlated closely with the average age at first birth in 1972, 1982, 1992 and also 2002. A higher average age of mothers at first birth predicted a larger excess risk of breast cancer (Pearson correlation [r]: 0.83, 0.79, 0.72 and 0.61 in 1972, 1982, 1992 and 2002, respectively;  $p < 0.0001$ ). RER of breast cancer in 2002 for those aged 15–44 years correlated closely with the mean age at first birth in 1982 and 1992 ( $r$ : 0.81 and 0.75;  $p < 0.0001$ ), whereas RER for those aged 45–54 years correlated strongly with age at first birth in 1972 and 1982 ( $r$ : 0.81 and 0.76;  $p < 0.0001$ ), and for those aged 55–64 years with age at first birth in 1972 ( $r$ : 0.77;  $p < 0.0001$ ). Based on the correlation coefficient between average age at first birth and RER in 2002, we estimated about 154,000 excess cases in 2002 that were explained by the variation of age at first child 30 years ago. In contrast only about 21,000 cases in 2002 were attributable to the delay of childbearing observed within the last 30 years.

**Conclusions:** The rising age at first childbirth of mothers has been followed by marked increases in breast cancer incidence. Later age at first birth seems to characterize secular diffusion of 'modern' lifestyles with a potentially large impact on increased breast cancer risk, and hence opens opportunities for prevention through other modifiable risk factors.

1215

POSTER

# Thyroid cancer incidence in the Republic of Belarus: 1970–2006 population based study

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The problem with thyroid cancer incidence in Belarus is very important as drastic growth of this disease was induced in the total Belorussian population after the accident in Chernobyl (in 1986), by huge radiation contamination with <sup>131</sup>I. The aim of this study was to describe some important particularities of thyroid cancer incidence rate dynamics in Belorussian population since 1970 to 2006th year.

Our study was based on the analysis of Belorussian Cancer registry data for 37 year span of time. For study period 15,916 new cases of thyroid cancer have been registered (12,877 in females and 3,039 in males). In the 1970s 65 cases of thyroid cancer were detected (16 in males and 49 in females). Intensive growth in incidence rates of thyroid cancer started since the end of the 1980s. In 2006, 1,067 (196 in males and 871 in females) new cases of thyroid cancer were registered. Age-standardized incidence rates (AsR) have grown from 0.45 in the 1970s and 0.77 in 1986 to 3.4 in 2006 (males) and from 0.81 in the 1970s and 1.71 in 1986 to 13.1 in 2006 (females). People from urban areas have higher risk to develop thyroid cancer than those from rural regions (1.5 times more by age-standardized rates in 2006). Some changes of age-specific rates have been observed for study period. Described above tendency of incidence rate growth is noted in adult people which are older than 20 years. In the younger groups some specific peaks can be observed at different time intervals for an according age group. Analysis by birth cohorts allowed to make a conclusion that these peaks of age-specific incidence rates are noted for children who were born from 1982 to 1986, those who were 0–5 years old at the moment of the disaster. In the total population in the 1970s the maximum of AsR was noted in 75–79 (females) and in 70–74 (males), but by 2006 the peak of AsR has been shifted to 50–59 (females) and 55–64 (males) years age groups. AsR peak has been getting sharper the more cases have been registered. Analysis by region has shown the highest level of thyroid cancer incidence (ASR) is noted in Gomel, Mogilev and Brest regions and Minsk-city. But while AsR have been going down for the last 6 years in Gomel

and Mogilev regions, they are increasing in Minsk and Brest region in the same period. Finally for the last six years we are observing a tendency to stabilization of thyroid cancer incidence rates at the level of AsR = 13.1 per 100,000 females and ASR = 3.5 per 100,000 males.

1216

POSTER

# Cigarette smoking, alcohol drinking and the risk of gallbladder cancer death: a prospective cohort study in Japan

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**Background:** Gallbladder cancer is a rare cancer with a poor prognosis and few risk factors that have been identified with sufficient statistical reliability. This study was conducted to evaluate the association of cigarette smoking and alcohol consumption with the risk of gallbladder cancer death using the data set from a prospective study.

**Materials and Methods:** A baseline survey of 45 areas throughout Japan was conducted from 1988 to 1990, and a total of 113,496 participants (65,740 women) aged 40 to 89 years at entry were followed for 15 years. During the follow-up period, 165 gallbladder cancer deaths (95 women) were documented. Information on smoking and drinking habits and lifestyle factors at baseline were collected through a self-administered questionnaire. A proportional hazard model was used to estimate hazard ratios (HR).

**Results:** Among women, the HR of current smokers at risk of gallbladder cancer death posed two-fold elevated risk after adjusting for age and drinking, but the numbers of cigarettes per day or 'cigarette-years' among current smokers did not show clear association with the risk. Association between alcohol consumption and the risk was not clear. Among men, HR (95 percent confidence interval: 95% CI) of current smoker was 2.27 (1.05, 4.90) after adjusting for age and drinking. HRs (95% CIs) of those who smoked 21 cigarettes or more per day and those with 801–1000 cigarette-years were 3.18 (1.18, 8.53) and 3.44 (1.40, 8.45), respectively, and linear positive associations were observed between that risk and the number of cigarettes per day ( $P$  for trend = 0.007) or 'cigarette-years' ( $P$  for trend = 0.012). After adjusting for age and smoking, the alcohol dose was linearly associated with risk ( $P$  for trend = 0.004), where the HR (95% CI) among those who consumed 72.0 g or more of pure alcohol per day was 3.60 (1.29, 9.85).

**Conclusions:** Among both men and women, smoking may elevate the risk of death from gallbladder cancer. Drinking may pose an elevated risk among men, but it is less clear among women.

1217

POSTER

# Estimation of an optimal chemotherapy utilisation rate for lung cancer

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**Background:** Chemotherapy utilisation rates for lung cancer show wide variation, but there is no benchmark against which these rates can be compared. This study aims to estimate a benchmark of optimal chemotherapy utilisation for lung cancer.

**Material and Methods:** Indications for chemotherapy in lung cancer were identified from treatment guidelines. Epidemiological data on lung cancer histology, staging, performance status and recurrence rates after treatment were identified. A chemotherapy utilisation tree was constructed to calculate the optimal proportion of lung cancer patients who should receive chemotherapy at least once during the course of their disease according to the best available evidence. Sensitivity analysis was performed where there was uncertainty regarding indications for chemotherapy. The estimated optimal chemotherapy utilisation rate was compared to reported actual first treatment rates of chemotherapy from the American College of Surgeons National Cancer Database (NCDB) and from the Thames Cancer Registry (TCR) in South East England.

**Results:** Chemotherapy is recommended at least once in 73% of all lung cancer patients (69% of patients with non-small cell lung cancer [NSCLC] and 93% of small cell lung cancer [SCLC] patients). The issue of whether adjuvant chemotherapy is indicated for Stage IB NSCLC is controversial; it is not recommended in this model of optimal utilisation. If adjuvant chemotherapy is recommended for patients with Stage IB NSCLC,