

higher risk of death from any cause compared to women consuming a more anti-inflammatory diet (HR Q4:Q1 = 1.18; 95% CI, 1.01–1.38; *P* trend = 0.015). In analyses using DII score from both diet and supplements, a pro-inflammatory DII score was associated with even higher risk of all-cause mortality (HRQ4:Q1 = 1.63; 95% CI, 1.40–1.91; *P* trend < 0.0001). Conclusions: Consuming a more pro-inflammatory diet after cancer diagnosis was associated with increased risk of death from any cause.

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Hormone Contraception before the First Birth and Ovarian Cancer Risk

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Introduction: Combined oral contraceptive (OC) use strongly and consistently reduces the risk for epithelial ovarian cancer (EOC); longer durations of use and more recent use are associated with the strongest reductions in risk. However, it is unknown if exclusive OC use before the first birth is associated with a reduction in EOC risk many years later. Therefore, we investigated the risk for EOC among parous women associated with exclusive OC use before the first birth. **Methods:** From a population-based case-control study in Alberta and British Columbia, Canada, 2001–2011, we included 1144 invasive EOC cases and 2513 controls who were >40 years at diagnosis/reference date. Participants reported OC use and all pregnancies via a telephone interview or self-administered questionnaire (in the early years of the study). Duration of OC use was evaluated as a continuous variable and by categories: non-users (never use or <6 months of use), <5, 5–<10, >10 years, unknown. Using logistic regression, we estimated adjusted odds ratios (aORs) and 95% confidence intervals (CI), controlling for study site, age, parity, breastfeeding, first degree family history of breast/ovarian cancer, tubal ligation, and BMI. **Results:** OC use at any time during reproductive life was associated with a 42% reduced risk for EOC relative to non-users (aOR = 0.58, 95% CI, 0.49–0.69). Among parous women, each additional year of exclusive OC use before the first birth conferred an 11% risk reduction relative to non-users (aOR = 0.89 95% CI, 0.86–0.94, linear trend *p*-value <0.01). Results were similar when we restricted to cases with high grade serous cancers (aOR = 0.90 95% CI, 0.84–0.95, linear trend *p*-value <0.01) and for cases with endometrioid/clear cell cancer (aOR 0.88 95% CI, 0.80–0.95, linear trend *p*-value < 0.01). **Discussion:** Among parous women, exclusive use of OCs before the first birth was associated with a strong reduction in EOC risk many years later. Because OCs stop ovulation, this reduced risk may be due to a reduction in lifetime ovulatory cycles. However, it is also possible that OC use at younger ages, before the first birth, represents a window of opportunity to have a substantial impact on reducing risk that remains for many years, informing possible prevention strategies.

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Dietary Adequacy among Tobacco User Households in Bangladesh

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Background: Smokers have less adequate diet as compared to non-smokers. The indirect effects of tobacco on diet may have profound implications for health and disease outcomes. Less is known about the influence of tobacco on dietary intakes in low-income countries where malnutrition is a major public health challenge. Additionally, the effect of smokeless tobacco on dietary intake are unknown. The purpose of this study was to evaluate influence of tobacco use on dietary intakes in a developing country. **Methods:** We used the nationally representative Household Income Expenditure Survey (HIES-2010) from Bangladesh. Detailed dietary data including both ethnic and regional specific foods were collected for 14 days and comprised of 7 visits with two days recalls. Overall, 71% of the households reported positive expenditure on tobacco (smoking and/or smokeless), and were considered tobacco users. **Results:** Out of 12240 households, 2061 used smoking tobacco only (16.8%), 3284 used smokeless tobacco only (26.8%), and 3348 were dual-users (27.4%). Our results indicate that after controlling for household expenditure, household size, place of residence, and education, tobacco users consumed significantly lower daily mean per capita of vegetables ($\beta = -18.35$ g/day; *P* < 0.0001), milk and dairy ($\beta = -12.83$ g/day; *P* < 0.0001), fish ($\beta = -11.19$ g/day; *P* < 0.0001), meat ($\beta = -7.60$ g/day; *P* < 0.0001), legumes ($\beta = -3.31$ g/day; *P* < 0.0001), eggs ($\beta = -1.60$ g/day; *P* < 0.0001) as compared to non-users. However, mean per capita daily intakes of cereal products ($\beta = 24.744$ g/day; *P* < 0.0001) was significantly higher among tobacco users as compared to non-users. We observed similar significant associations for smokeless tobacco users as compared to non-users. **Conclusion:** The project provides evidence to support policy recommendations for addressing poor dietary intakes and malnutrition burden among tobacco user households in a developing country like Bangladesh. Addressing tobacco use in relation to malnutrition would make tobacco control a higher priority for effective tobacco related chronic disease prevention, as well as achieving the Millennium Development Goal 1, and post-2015 development agenda of eradicating extreme poverty and hunger.

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Influence of Personal Exposure to the Cancer of a Loved One on the Breast Cancer Prevention Decisions of High Risk Women

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Purpose: To explore the impact of close personal exposure to cancer in a family member or friend in the prevention decisions of women at elevated risk of breast cancer. **Methods:** 50 semi-structured interviews with women at elevated risk of breast cancer, focusing on perceptions of risk; risk information;

consideration of prevention options; decision-making processes and networks, and psychosocial well-being. Transcribed data are analyzed with NVivo 10, using grounded theory methods. Results: Prevention decision making by women who have had close contact with the cancer diagnosis and treatment of a loved one (most often a mother or grandmother, but sometimes a sister, cousin, or close friend) is importantly influenced by these experiences. The process of deciding whether and when to undertake prophylactic mastectomy or oophorectomy, chemoprevention, enhanced surveillance, and/or genetic testing is substantially different in women who have and have not had close personal experience with the cancer of a loved one. Women who have experienced the deaths of one or more loved ones express strong motivation and willingness to undertake definitive interventions; most often this means prophylactic surgery, but this can also include chemoprevention. These women often feel that they are likely to be diagnosed with breast cancer eventually, and seek decisive methods to avoid what they perceive as a life-threatening diagnosis. Women whose loved ones have survived and thrived after a cancer diagnosis are more oriented toward careful surveillance through screening tests and physician checks. These women usually see breast cancer as a challenge they may have to deal with in the future, and they are motivated to set the stage for treatment success by establishing ongoing relationships with highly competent healthcare providers, and by being diagnosed as early as possible. Conclusions: Cancer care has strong effects beyond the cancer patient herself, affecting the decision-making processes and the prevention-related decisions of loved ones as well. Future prevention research for women at elevated risk should consider how their prior experiences with the cancer of friends or family members structure women's expectations of cancer risk, prevention, and outcomes.

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Active Tobacco Smoke and Environmental Tobacco Smoke Exposure During Potential Biological Windows of Susceptibility in Relation to Breast Cancer

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Purpose: Our objective was to prospectively examine active smoking and environmental tobacco smoke (ETS) in relation to breast cancer risk, with a focus on exposures during potential windows of susceptibility. Methods: Sister Study cohort participants ($n = 50,884$) were enrolled between 2003 and 2009 and were followed for a breast cancer diagnosis. Women ages 35–74 in the United States and Puerto Rico were eligible if they had a sister who had been diagnosed with breast cancer. Study participants completed extensive telephone and paper questionnaires including information on established breast cancer risk factors as well as active smoking history and exposure to ETS while in utero and during childhood and adult years. Cox regression analysis was used to estimate adjusted hazard ratios (HRs) and 95% confidence intervals (95% CIs) for invasive

breast cancer incidence associated with active smoking and ETS exposure. Results: During follow-up (mean = 6.4 years), 1,843 invasive breast cancers were diagnosed in the study population. Exposure to ETS in adulthood was not associated with increased breast cancer risk. However, nonsmoking women who were exposed to ETS throughout their childhood (18 years) had an 18% higher risk of breast cancer (95% CI, 1.02–1.38) relative to those without any childhood ETS. In utero ETS exposure also was associated with a modest increase in breast cancer incidence (HR = 1.16, 95% CI, 1.01–1.32) among nonsmokers as was paternal smoking prior to the participant's mother's pregnancy (HR = 1.12, 95% CI, 0.98–1.29). Additionally, active smoking prior to first pregnancy for 10 or more pack-years (HR = 1.31, 95% CI, 1.02–1.67) was associated with an elevated risk of breast cancer. Conclusions: In this large, prospective study, we report evidence that both active smoking and ETS exposure during potential windows of susceptibility, including in utero exposure, childhood and prior to first pregnancy, are associated with higher risk of breast cancer.

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Neighborhood Socioeconomic Deprivation and Geographic Heterogeneity of Tobacco Environment in Missouri

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Purpose: To examine neighborhood characteristics associated with geographic distribution of tobacco sale outlets in Missouri. Methods: We obtained the addresses of tobacco outlets in Missouri from the Missouri Department of Mental Health. We geocoded these addresses and computed the outlet density by 5-digit ZIP codes. Using the data from the 2008–2012 American Community Survey, we developed a ZIP Code Tabulation Area (ZCTA)-level socioeconomic deprivation (SED) index. We analyzed the relationships of tobacco outlet density with neighborhood SED index and five separate socioeconomic indicators (%population with less than high school, %population unemployed, %households below the poverty, % population under the poverty, and %African Americans). Results: There were more than 5,000 tobacco retailers within Missouri in January, 2014. The number of tobacco retailers ranged from 0 to 56 (median = 2) per ZIP code, while tobacco outlet density ranged from 0 to 29 per 1,000 persons age 18+ (median: 1.18). Tobacco outlet density was significantly correlated with neighborhood SED ($\rho = 0.21$, $P < 0.001$). The consistency of quartiles of both variables was also statistically significant (weighted Kappa = 0.11, $P < 0.001$). Logistic regression analysis indicated that neighborhood SED was associated with more than 3 times higher odds of denser tobacco outlets (>median density) (the most vs. least deprived quartile: odd ratio = 3.24, 95% confidence interval = 2.26–4.65). Similar results were also found for each of the five individual socioeconomic indicators. Conclusion: Geographic distribution of tobacco retailing outlets was strongly associated with neighborhood SED environment. Neighborhoods with greater SED

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