

Table 2.36. Cohort studies of consumption of alcoholic beverages and cancer of female breast

| Reference, location, name of study | Cohort description (No. in analysis) | Exposure assessment | Exposure categories | No. of cases | Relative risk (95% CI) | Adjustment factors | Comments |
|---|---|--|-----------------------------------|--------------|------------------------|---|---|
| Ericson <i>et al.</i> (2007), Sweden, Malmö Diet and Cancer Cohort [update of Mattisson <i>et al.</i> (2004)] | Analytical cohort of 11 699 women; aged > 50 years; recruited 1991–96; follow-up until 2003; 392 invasive cases identified through cancer registry | Interview-administered diet history (7- day diary) | <i>Intake (g/d)</i> | | | Age | |
| | | | None | 26 | 1.0 | | |
| | | | < 15 | 304 | 1.25 (0.84–1.87) | | |
| | | | 15–29 | 47 | 1.20 (0.74–1.94) | | |
| | | | ≥ 30 | 15 | 2.52 (1.33–4.77) | | |
| Mørch <i>et al.</i> (2007), Denmark, Danish Nurse Cohort Study | Analytical cohort of 17 647 women, aged > 44 years, recruited 1993; followed-up until 2001; 457 invasive cases identified through cancer registry, hospital discharge registry and Danish Breast Cancer Group | Self-administered questionnaire | <i>Usual intake (drinks/week)</i> | | | Age, age at first birth, menarche, family history, history of benign breast disease | No differences by menopausal status; binge drinking at week-ends (> 10 drinks over the week-end versus 1 drink) associated with an increased risk compared to women drinking 1–3 drinks/week. Risk also increased among women drinking 4–5 drinks versus 1 drink on the last week day |
| | | | 0 | 92 | 1.27 (0.92–1.75) | | |
| | | | 1–3 | 65 | 1.0 | | |
| | | | 4–7 | 74 | 0.99 (0.71–1.38) | | |
| | | | 8–14 | 95 | 1.10 (0.80–1.51) | | |
| | | | 15–21 | 61 | 1.33 (0.94–1.89) | | |
| | | | 22–27 | 42 | 2.30 (1.56–3.39) | | |
| | | | > 27 | 28 | 1.62 (1.04–2.52) | | |
| <i>Per drink/day</i> | | 1.02 (1.01–1.03) | | | | | |

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| Visvanathan <i>et al.</i> (2007) CLUE II, Washington County, US | Nested case-control study (cohort of 14 625 women recruited 1989; followed-up until 2002); 321 cases identified through cancer registries, matched to 313 non-malignant and alive controls, by age, ethnicity, freeze/thaw status, availability of food-frequency questionnaire, menopausal status | Self-administered questionnaire | <i>Alcohol status in last year</i> | | | | Education, smoking, family history, age at menarche, age at first birth, breastfeeding, oral contraceptive use, hormone-replacement therapy use, body mass index | No significant difference by menopausal status, although association with drinking slightly stronger in younger (premenopausal) versus older women; significant association with drinking among women with a high education level; association with wine, but not for beer or liquor |
| | | | Non-drinker | 167 | 1.0 | | | |
| | | | Drinker | 95 | 1.40 (0.97–2.03) | | | |
| | | | <i>Women</i> | | | | | |
| | | | Non-drinker | | 1.0 | | | |
| | | | Drinker v Non-drinker | | 2.69 (1.00–7.26) | | | |
| | | | <i>Women</i> | | | | | |
| | | | | | > 51 years | | | |
| | | | Drinker | | 1.0 | | | |
| | | | | | 1.25 (0.84–1.87) | | | |

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| Zhang <i>et al.</i> (2007) Women's Health Study, US | Analytical cohort of 38 454 women recruited in 1992, aged 45 and older; followed-up until 2004; 1 484 self-reported cases (1 190 invasive, 294 in situ) verified through medical records | Self-administered questionnaire | <i>Intake in last year (g/d)</i> | | | | Age, randomized treatment assignment, age at menarche, age at first birth, parity, menopausal status, age at menopause, hormone-replacement therapy use, body mass index, family history, benign breast disease, physical activity, vitamin supplement use, energy intake | No significant difference by beverage type, although significant positive association for beer intake, and no significant association for white wine, red wine or liquor; no significant difference by subgroups of menopausal status, body mass index, family history, folate intake or hormone-replacement therapy use, although slightly higher risk with alcohol intake in current users and no association in never or past users |
| | | | None | | | | | |
| | | | 0.1–4.6 | 516 | 1.0 | | | |
| | | | 5–9.9 | 549 | 1.02 (0.90–1.15) | | | |
| | | | 10–14.9 | 181 | 1.13 (0.95–1.34) | | | |
| | | | 15–29.9 | 109 | 1.14 (0.92–1.40) | | | |
| | | | ≥ 30 | 88 | 1.16 (0.92–1.45) | | | |
| p for trend | 41 | 1.32 (0.96–1.82) | | | | | | |
| Per 10 g/d | | <i>All tumours</i> | | 1.07 (1.01–1.14) | | | | |
| Per 10 g/d | 1 190 | <i>Invasive tumours</i> | | 1.09 (1.02–1.16) | | | | |
| Per 10 g/d | 362 | <i>Premenopausal women</i> | | 1.08 (0.96–1.22) | | | | |
| Per 10 g/d | 910 | <i>Postmenopausal women</i> | | 1.07 (0.99–1.15) | | | | |
| Duffy <i>et al.</i> (2009), US, Women's Health Initiative – Observational Study | Analytical cohort of 88 530 women aged 50–79 years, recruited 1993–98; follow-up for a median of 5.5 years; 1 783 self-reported cases verified through pathology and radiology reports | Self-administered questionnaire | <i>Usual intake (drinks/week)</i> | | | | Age, ethnicity, income, education, smoking, body mass index, breast biopsy, parity, breastfeeding, family history, hormone replacement therapy use, age at menarche, age at menopause, exercise (weekly METs) | No significant difference by folate intake |
| | | | None | 561 | 1.0 | | | |
| | | | < 5 | 470 | 1.10 (0.97–1.24) | | | |
| | | | 5–15 | 322 | 1.14 (0.99–1.31) | | | |
| | | | > 15 | 246 | 1.13 (0.96–1.32) | | | |
| | | | Per 1 g/d | | | 1.005 (1.001–1.009) | | |
| p for trend | | | 0.009 | | | | | |

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| Kabat <i>et al.</i> (2008); update of Friedenreich <i>et al.</i> (1993) and Rohan <i>et al.</i> (2000). Canadian National Breast Screening Study, Canada | Analytical cohort of 49 654 women aged 40–59 years enrolled in a randomized controlled trial of screening for breast cancer and who completed a dietary questionnaire, recruited 1980–85; follow-up for an average of 16 years; 2 491 cases identified through cancer databases | Self-administered questionnaire | <i>Alcohol intake (g/d)</i> None < 5 5–9 10–19 20–29 ≥ 30 p for trend | Not given | 1.0 1.00 (0.91–1.12) 0.98 (0.86–1.13) 1.07 (0.93–1.23) 1.08 (0.89–1.32) 1.17 (0.98–1.39) 0.06 | Age, body mass index, smoking, education, menopausal status, family history, history of breast biopsy, age at menarche, parity, use of oral contraceptives, use of hormone replacement therapy, energy intake | No significant difference by intake of folate or B vitamins or by menopausal status |

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|--|--|---------------------------------|-----------------------------------|--|---|------------------------------|--|--|-----|-----|--|--|--|
| Nielsen and Grøn­bæk (2008) and Thygesen <i>et al.</i> (2008); Update of Petri <i>et al.</i> (2004). Data also presented in Rod <i>et al.</i> (2009). Denmark, Copenhagen City Heart Study | Nielsen and Grøn­bæk (2008) Analytical cohort of 5 035 postmenopausal women, recruited 1981–83; followed-up until 2002; 267 cases identified through cancer registry | Self-administered questionnaire | <i>Usual intake (drinks/week)</i> | | | | Age, education, physical activity, body mass index, smoking, parity, psychological stress, hormone-replacement therapy use | Smallest cohort study; significant interaction with hormone-replacement therapy use – increase risk among women drinking 8–14 drinks/week and who were current hormone users (HR = 2.99, 95% CI: 1.69–5.29) versus abstainers who were not hormone users; no association among non hormone-replacement therapy users | | | | | |
| | | | < 1 | 107 | 1.0 | | | | | | | | |
| | | | 1–7 | 101 | 1.19 (0.90–1.57) | | | | | | | | |
| | | | 8–14 | 36 | 1.28 (0.87–1.89) | | | | | | | | |
| | | | 15–21 | 14 | 1.61 (0.92–2.84) | | | | | | | | |
| | | | > 21 | 9 | 1.54 (0.77–3.10) | | | | | | | | |
| | | | p for trend | | 0.06 | | | | | | | | |
| | | | <i>Per drink/day</i> | | | 1.11 (0.99–1.25) | | | | | | | |
| | | | Thygesen <i>et al.</i> (2008) | Analytical cohort of 9 318 women recruited in 1976; age range not stated, although < 37 to > 55 years; followed-up until 2002; 476 cases identified through cancer registry (97% histologically confirmed) | Self-administered questionnaire at recruitment and 3 times during follow-up | <i>Baseline intake (g/d)</i> | | | | | Age, education, physical activity, body mass index, smoking, parity, hormone-replacement therapy use | Small cohort and small numbers of cases; risk was attenuated when using updated alcohol information: no association when using updated information [this may be due to a long latency period between alcohol intake and breast cancer risk]. | |
| | | | | | | < 1.71 | | | 145 | 1.0 | | | |
| 1.71–12 | 236 | 1.00 (0.80–1.24) | | | | | | | | | | | |
| 13–24 | 79 | 1.36 (1.01–1.81) | | | | | | | | | | | |
| 25–47 | 8 | 1.71 (0.82–3.57) | | | | | | | | | | | |
| ≥ 48 | 4 | 4.64 (1.67–12.9) | | | | | | | | | | | |
| p for trend | | < 0.001 | | | | | | | | | | | |

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| Allen <i>et al.</i> (2009), United Kingdom, Million Women Study | Analytical cohort of 1 280 296 women recruited 1996–2001; aged 50–64 years; follow-up until 2006; 28 380 cases identified through cancer registries | Self-administered questionnaire at baseline and 3 years later | <i>Usual intake (drinks/week)</i> | | (Floated 95% CI) | Age, region, socioeconomic status, body mass index, smoking, physical activity, oral contraceptive use, hormone replacement therapy use | Alcohol intake of < 2 drinks/week taken to be the reference group; no significant difference by hormone replacement therapy use; no difference by beverage type (wine versus other drinks) or by red, white or both types of wine |
| | | | None | 6 409 | 1.00 (0.97–1.03) | | |
| | | | < 2 | 7 841 | 1.00 (0.98–1.02) | | |
| | | | 3–6 | 6 642 | 1.08 (1.05–1.10) | | |
| | | | 7–24 | 5 672 | 1.13 (1.10–1.16) | | |
| | | | ≥ 15 | 1 816 | 1.29 (1.23–1.35) | | |
| Per 10 g/d p for trend | | 1.12 (1.09–1.14) < 0.001 | | | | | |
| Engeset <i>et al.</i> (2009), Norwegian European Prospective Investigation into Cancer and Nutrition; data also included in Tjønneland <i>et al.</i> (2007) | Analytical cohort of 34471 women recruited in 1998; age range not stated (mean: 48 years); followed-up until 2005; 547 cases identified through cancer registry | Self-administered questionnaire | <i>Alcohol dietary pattern</i> | 547 | 1.0 1.01 (0.71–1.45) | Age, smoking, energy, use of oral contraceptives | 85% of women included in the ‘alcohol’ dietary pattern cluster had an alcohol intake ≥ 27 g/d; no significant difference by menopausal status |
| | | | No | | | | |
| | | | Yes | | | | |

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| Gibson <i>et al.</i> (2009); Manila, Philippines | Nested case-control study (cohort of 151168 women recruited 1995–97, aged 35–64 years, as part of a randomized controlled trial of screening for breast cancer); follow-up until 2001; 123 incident cases matched to 978 controls, on area of residence, date of breast examination, age | Interview-administered questionnaire | <i>Drinker</i> No Yes | 115 8 | 1.0 0.52 (0.2–1.5) | Age, area of residence, parity, age at first birth, education | |
| Lew <i>et al.</i> (2009), NIH-AARP Study | Analytical cohort of 184418 women recruited 1995–1996; aged 50–71 years; follow-up until 2003 (for an average of 7 years); 5 461 cases identified through cancer registry | Self-administered questionnaire | <i>Alcohol intake (g/d)</i> 0 0.1–5 5.1–10 10.1–20 20.1–35 > 35 Per drink/day p for trend | 1 493 2 531 395 550 265 227 | 1.0 1.04 (0.97–1.10) 1.04 (0.93–1.16) 1.13 (1.02–1.25) 1.23 (1.08–1.41) 1.35 (1.17–1.56) 1.05 (1.03–1.07) < 0.001 | Age, ethnicity, height, body mass index, age at first birth, parity, family history, age at menopause, physical activity, smoking, oral contraceptive use, hormone-replacement therapy use, breast biopsies, folate intake, fat intake, energy intake | No significant difference by subgroup of hormone-replacement therapy use, total folate intake, body mass index, family history, history of breast biopsy, smoking; similar associations for all histological subtypes and for all beverage types |

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| Li <i>et al.</i> (2009b), USA, Kaiser Permanente | Analytical cohort of 70033 women recruited 1978–1985; mean age 40.6 years; followed-up until 2004; 2 829 cases identified through cancer registry | Self-administered questionnaire | <i>Alcohol intake</i> | | | | Age, ethnicity, education, body mass index, marital status, smoking, breast surgery, family history, parity | No significant difference by subgroups of ethnicity, age at recruitment, age at diagnosis, smoking, stage of cancer, time between recruitment and diagnosis, vital status; no significant difference by beverage type |
| | | | Never | 442 | 1.0 | | | |
| | | | Former | 82 | 1.2 (1.0–1.5) | | | |
| | | | < 1 drink/month | 761 | 1.1 (1.0–1.3) | | | |
| | | | < 1 drink/day | 896 | 1.1 (1.0–1.2) | | | |
| | | | 1–2 drinks/day | 466 | 1.2 (1.1–1.4) | | | |
| | | | ≥ 3 drinks/day | 147 | 1.4 (1.1–1.7) | | | |
| Per drink/day | | 1.05 (1.01–1.10) | | | | | | |
| p for trend | | 0.008 | | | | | | |