

Supplementary Table 1. International Classification of Disease (ICD) codes used to identify biliary tract cancers in the Biliary Tract Cancers Pooling Project.

Cancer	Topography code *		Morphology codes*
	ICD-O/ICD-10	ICD-9	
Gallbladder cancer	C23	156.0	All morphology codes [†]
Intrahepatic bile duct cancer	C22.1	155.1	All morphology codes [†]
	C22.0	155.0	8032-8033, 8041, 8070-8071, 8140-8141, 8160, 8260, 8480, 8481, 8490, 8560
Extrahepatic bile duct cancer	C24.0	156.1	All morphology codes [†]
	Any	Any	8162
Ampulla of Vater cancer	C24.1	156.2	All morphology codes [†]

*If a topography code existed but there was no morphology code, the topography code was used alone. A total of 49 cases (1.2%) were missing morphology codes.

[†]All morphology codes except for Kaposi's sarcoma (9140), mesothelioma (9050-9055), and hematologic malignancies (9590-9989).

Supplementary Table 2. Assessment of cigarette smoking by study contributing to the Biliary Tract Cancers Pooling Project.*

Study	Cigarette Smoking Assessment
Agricultural Health Study	<p>"During your lifetime, have you smoked at least 100 cigarettes?" Yes; No</p> <p>"Do you smoke cigarettes now?" Yes; No</p> <p>"What is the total number of years you smoked cigarettes? Remember to leave out years you did not smoke." Open response.</p> <p>"On the average, how much do you or did you smoke each day? 1 pack = 20 cigarettes" 10 cigarettes or less; 11- 20 cigarettes; 21 - 40 cigarettes; More than 40 cigarettes</p>
Adventist Health Study-2	<p>"Have you ever smoked regularly?" No; Yes, cigars; Yes, pipe; Yes, cigarettes</p> <p>"I am still smoking." Checkbox</p> <p>"If you have ever smoked cigarettes regularly, at what age did you first start and last stop smoking?" Open response</p> <p>"Please mark the usual number you smoked per day or per week during each of the given time periods (past 12 months, 2 - 5 years ago, 6 - 10 years ago, 11 - 15 years ago, 16 or more years ago, average during all smoking years)." None or less than 1; 1-3; 4-6; 7-10; 11-19; 20 +</p>
Alpha-tocopherol, Beta-Carotene Cancer Prevention Study	<p>"How many years have you smoked regularly?" Open response</p> <p>"How much do you presently smoke daily on an average?" Open response manufactured cigarettes a day; self-made cigarettes a day</p>
Breast Cancer Detection Demonstration Project	<p>"Have you smoked a total of 100 cigarettes or more in your lifetime?" Yes; No</p> <p>"Do you smoke cigarettes now?" Yes; No</p> <p>"Considering the times you may have stopped smoking and then restarted, how many <u>total</u> years have you or did you actually smoke cigarettes?" Open response</p> <p>"During the time you have smoked regularly, how many cigarettes do or did you usually smoke per day?" Open response</p>

Cohort of Swedish Men	<p>"Have you smoked cigarettes regularly at some time?" No, I have never smoked cigarettes; Yes</p>
	<p>"Still smoking." Checkbox</p>
	<p>"I started smoking when I was __ years." Open response</p>
	<p>"Stopped smoking for __ years." Checkbox/open response</p>
Cancer Prevention Study II	<p>"Have you smoked at least 100 cigarettes in your entire life?" Yes; No</p>
	<p>"Do you smoke cigarettes now?" Yes; No</p>
	<p>"IF YES: How many years have you smoked? (If less than 1 put 00)" Open response</p>
	<p>"How many times since you first started smoking have you quit smoking for 6 months or longer? (If never put 00)" Open response</p>
	<p>"IF NO: How many years did you smoke? (If less than 1 put 00)" Open response</p>
	<p>"During the years that you were smoking, how many times did you quit smoking for 6 months or longer? (If never put 00)" Open response</p>
	<p>"IF YES: On average, about how many cigarettes a day do you smoke? (If less than 1 cigarette per day, put 00)" Open response</p>
	<p>"IF NO: On average, how many cigarettes a day did you smoke? (If less than 1 cigarette per day, put 00)" Open response</p>

European Prospective Investigation into Cancer and Nutrition	<p>"Have you ever smoked as much as one cigarettes a day for as long as a year?" Yes; No</p> <p>"Do you smoke cigarettes now?" Yes; No</p> <p>"If yes, how old were you when you started smoking cigarettes regularly?" Open response</p> <p>"If you have stopped smoking, how old were you when you last smoked?" Open response</p> <p>"If yes, how many cigarettes do you smoke each day?" Open response (current smokers only)</p>
Health Professionals Follow-Up Study	<p>"Have you smoked 20 packs of cigarettes or more in your lifetime?" No; Yes, currently smoke; Yes, smoked in past but quit</p> <p>Smoke start age derived from: "At each age: average number of cigarettes per day. AGE: <15. 15-19. 20-29, 30-39, 40-49, 50-59, 60+" None; 1-4; 5-14; 15-24; 25-34; 35-44; 45+</p> <p>"Yes, smoked in past but quit --> How long ago?" <1 year; 1-2 years; 3-5 years; 6-9 years; 10+ years</p> <p>"At each age: average number of cigarettes per day. AGE: <15. 15-19. 20-29, 30-39, 40-49, 50-59, 60+" None; 1-4; 5-14; 15-24; 25-34; 35-44; 45+</p>
Iowa Women's Health Study	<p>"Have you ever smoked cigarettes on a regular basis, that is, more than 100 cigarettes in your entire life?" Yes; No</p> <p>"Do you smoke cigarettes now?" Yes; No</p> <p>"How old were you when you first started smoking cigarettes on a regular basis?" Open response</p> <p>"How old were you when you stopped smoking?" Open response</p> <p>"On the average, during the entire time you smoked, how many cigarettes did you smoke per day?" Open response</p>

Japan Public
Health Center-
based prospective
Study 1

"Have you ever been a smoker?"

Yes; No

"Do you currently smoke cigarettes?"

No; Yes; Occasionally

"If yes, how old were you when you began smoking?"

Open response

"If you no longer smoke, how old were you when you quit smoking?"

Open response

"If yes, how many cigarettes a day do you smoke?"

Open response

Japan Public
Health Center-
based prospective
Study 2

"Do you currently smoke cigarettes?"

No; Yes

"If yes, how old were you when you began smoking?"

Open response

"If you no longer smoke, but smoked before, how old were you when you began smoking?"

Open response

"If you no longer smoke, but smoked before, how old were you when you quit smoking?"

Open response

"If yes, how many cigarettes a day do you smoke?"

Open response

"If you no longer smoke, but smoked before, how many cigarettes per day did you smoke?"

Open response

Melbourne Collaborative Cohort Study	<p>"Have you ever smoked at least 7 cigarettes a week for at least a year?" Yes; No</p> <p>"Do you smoke at least 7 cigarettes a week?" Yes; No</p> <p>"How old were you when you first started smoking at least 7 cigarettes a week?" Open response</p> <p>"If no, at what age did you stop smoking at least 7 cigarettes a week?" Open response</p> <p>"How many cigarettes do/did you smoke a day on average?" Open response</p>
Multiethnic Cohort Study	<p>"Have you ever smoked a total of 20 or more packs of cigarettes in your lifetime?" No; Yes, and I currently smoke; Yes, but I quit smoking</p> <p>"If yes, what is the total number of years you smoked?" 10 years or less; 11-20 years; 21-30 years; 31-40 years; 41 years or more</p> <p>"What is the average number of cigarettes that you smoked per day?" 5 cigarettes or less; 6-10 cigarettes; 11-20 cigarettes; 21-30 cigarettes; 31 cigarettes or more</p>

Nurses' Health Study	<p>"Do you smoke cigarettes CURRENTLY?" Yes; No</p> <p>If no: "Have you ever smoked cigarettes regularly in the past?" Yes; No</p> <p>"How old were you when you first started to smoke regularly?" Open response</p> <p>"Since you first started to smoke regularly, have you ever given up smoking cigarettes for 6 months or more?" Yes; No</p> <p>"How old were you when you last smoked regularly" Open response</p> <p>"From when you first started to smoke regularly until you last smoked regularly, did you ever give up smoking for 6 months or more?" Yes; No</p> <p>"On average, how many cigarettes do you smoke currently each day?" Open response</p> <p>"On average, how many cigarettes per day did you smoke when you last smoked regularly?" Open response</p>
National Institutes of Health-American Association of Retired Persons Diet and Health Study	<p>"Have you smoked 100 or more cigarettes during your entire life?" Yes; No</p> <p>"Do you currently smoke cigarettes or have you stopped?" Currently smoke; Stopped within last year; Stopped 1-4 years ago; Stopped 5 - 9 years ago; Stopped 20 or more years ago</p> <p>"Earliest age range at which avg. cigarettes consumed per day was reported no smoking indicated" Under 15; 15 -19; 20 -24; 20 -25; 30-39; 40-49; 50-59; 60-69; 70 and over; All categories missing or unknown</p> <p>"How many cigarettes per day do you or did you usually smoke?" 1 - 10; 11 - 20; 21 - 30; 31 - 40; 41 - 60; 61 or more</p>

New York University Women's Health Study	<p>"Did you ever smoke cigarettes?" Yes; No</p> <p>"Are you CURRENTLY smoking?" Yes; No</p> <p>"IF YES: At what age did you start?" Open response</p> <p>"IF NO: When did you stop?" Open response</p> <p>"Did you ever stop TEMPORARILY and then start up again?" Yes; No</p> <p>"IF YES: For how many years ALTOGEHTER did you stop smoking temporarily?" Open response</p> <p>"How many cigarettes do/did you usually smoke PER DAY?" Open response</p>
Physicians' Health Study	<p>"Have you ever smoked cigarettes regularly?" Never; Past only; Current</p>
Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial	<p>"Have you ever smoked cigarettes regularly for six months or longer?" No; Yes</p> <p>"Do you smoke cigarettes regularly now?" Open response</p> <p>"At what age did you start smoking cigarettes regularly?" Open response</p> <p>"At what age did you last stop smoking cigarettes regularly?" Open response</p> <p>"During periods when you smoked, how many cigarettes did or do you usually smoke per day?" 1-10; 11-20; 21-30; 31-40; 41-60; 61-80; 81 or more</p>

Radiation Effects Research Foundation Life Span Study	<p>“Have you ever smoked?” No; Yes</p> <p>“Do you smoke cigarettes now?” No; Yes</p> <p>“Cigarettes per day” Open response</p> <p>“Maximum per day in the past” Open response</p> <p>“At what age did you start smoking?” Open response</p> <p>“How long ago did you stop smoking?” Open response</p>
Singapore Chinese Health Study	<p>"Have you ever smoked at least one cigarette a day for 1 year or longer?" No; Yes, and I currently smoke; Yes, but I quit smoking</p> <p>"What is the total number of years that you smoked cigarettes on a regular basis?" 9 years or less; 10-19 years; 20-29 years; 30-39 years; 40 years or more</p> <p>"If you smoked manufactured cigarettes, what is the average number of cigarettes that you smoked per day?" 6 cigarettes or less; 7-12 cigarettes; 13-22 cigarettes; 23-32 cigarettes; 33-42 cigarettes; 43 cigarettes or more</p> <p>"If you smoked self-rolled cigarettes, how many tahils/liangs of tobacco, on average, did you smoke in a month?" 3 tahils or less; 4-6 tahils; 7-9 tahils; 10-12 tahils; 13 tahils or more</p>

Shanghai Cohort Study	<p>"Have you ever smoked at least one cigarette a day for six months or longer?" Yes; No</p> <p>"Do you smoke cigarettes daily now?" Yes; No</p> <p>"Please tell me how many years you have smoked cigarettes, excluding the years when you did not smoke." Open response</p> <p>"At what age did you stop smoking cigarettes daily?" Open response. Age in years or year started 19XX</p> <p>"At what age did you start smoking cigarettes daily?" Open response. Age in years or year started 19XX</p> <p>"During most of your adult life when you smoked, how many store bought cigarettes did you smoke on an average day?" Open response</p> <p>"How many liang of cigarette tobacco did you use in an average month?" Open response</p>
Sister Study	<p>"Have you ever smoked at least one cigarette per day for six months or longer?" Yes; No</p> <p>"Have you ever smoked at least one cigarette per month for one year or longer?" Yes; No</p> <p>"Have you smoked at least one cigarette per day, on average, over the past 12 months?" Yes; No</p> <p>"Have you smoked cigarettes regularly every year since then, or did you ever stop smoking for a year or longer?" Smoke every year; Stopped</p> <p>"How old were you when you [first/next] stopped smoking (an average of one cigarette per day) for a year or longer?" Open response</p> <p>"On average, about how many days per year did you smoke?" Open response</p> <p>"On the days that you smoked, about how many cigarettes did you usually smoke?" Open response</p> <p>"On average, about how many cigarettes have you smoked per day, per week, or per month over the past 12 months? [1 PACK=20; 1/2 PACK =10]" Open response (# of cigarettes Per day, Per Week, Per month or Total for past 12 months)</p>

Swedish Mammography Cohort	<p>"Have you ever smoke cigarettes regularly?" No, I have never smoked cigarettes; Yes, I started smoking when I was __ yrs</p> <p>"Still smoking" Checkbox</p> <p>"Stopped smoking" Checkbox</p> <p>"Stopped smoking __ years ago" Open response</p> <p>"Yes, I started smoking when I was __ yrs." Open response</p>
VITamins and Lifestyle Study	<p>"Have you ever smoked cigarettes regularly (at least 1 cigarette a day) for at least a year?" Yes; No</p> <p>"Do you smoke cigarettes now?" Yes; No</p> <p>"How many years have you been (or were you) a regular smoker? Do not count times you stayed off cigarettes." 1-4 years; 5-9 years; 10-19 years; 20-29 years; 30-39 years; 40 years or more</p>
Women's Health Initiative	<p>"During your entire life, have you smoked at least 100 cigarettes?" No; Yes</p> <p>"Do you smoke cigarettes now?" No; Yes</p> <p>"How many years have you been (were you) a regular smoker? Do not count the times you stayed off cigarettes." Less than 5 years; 5-9 years; 10-19 years; 20-29 years; 30-39 years; 40-49 years; 50 or more years</p> <p>"On average, how many cigarettes do you (did you) usually smoke each day?" Less than 1; 1-4; 5-14; 15-24; 25-34; 35-44; 45 or more</p>
Women's Health Study	<p>"Have you smoked 100 cigarettes or more in your lifetime?" No; Yes, currently smoke; Yes, smoked in past but quit</p> <p>"How many total years have you smoked?" Less than 5 years; 5-9 years; 10-19 years; 20-29 years; 30-39 years; 40-49 years; 50 or more years</p>

Women's Lifestyle
and Health Study

"Have you ever smoked regularly?"
Yes; No

"Check the number of cigarettes smoked daily at different ages. Ages: 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49"
Number of cigarettes smoked per day:
0; 1-4; 5-9; 10-14; 15-19; 20-24; 25+

"Check the number of cigarettes smoked daily at different ages. Ages: 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49"
Number of cigarettes smoked per day:
0; 1-4; 5-9; 10-14; 15-19; 20-24; 25+

*Many studies collected additional information on cigarette smoking. The information provided in this table reflects the data that were used for this analysis only.

Supplementary Table 3. Assessment of alcohol consumption by study contributing to the Biliary Tract Cancers Pooling Project.*

Study	Alcohol Consumption Assessment
Agricultural Health Study	<p>"During the past 12 months, how often did you usually drink any kind of alcoholic beverage?" Never; Less than one time a month; 1-3 times a month; 1 time a week; 2-4 times a week; Almost every day; Every day</p> <p>"During the past 12 months, about how many drinks would you have on a day when you drank? 1 drink= 1 beer, 1 glass of wine, or 1 shot of hard liquor." Didn't drink last year; 1 or 2 drinks; 3 or 4 drinks; 5-8 drinks; 9 or more drinks</p>
Adventist Health Study-2	<p>"Have you ever used alcoholic beverages even if only occasionally?" Yes; No</p> <p>"How often do you drink alcoholic beverages: beer (12 oz.), wine coolers (12 oz.), wine (3 ½ oz.), liquor (1 oz.)?" Never or rarely; 1-3 per month; 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p> <p>"If you eat this food, then choose your serving size. Standard serving size= 12 oz. beer, 3 ½ oz. wine, 1 oz. liquor" Standard; ½ or less; 1 ½ or more</p> <p>"Average alcohol intake during the time period(s) when you used alcohol. Use either the per month or per week section: 12 oz beer, 6 oz wine, 1 oz liquor" <1 per month; 1-2 per month; 3 per month; 1 per week; 2 per week; 3 per week; 4 per week; 5 per week; 6 per week; 7+ per week</p> <p>"If you have consumed alcohol during the past 12 months, please mark the amount you drank per week or month during this period (mark one response for each line): 12 oz beer, 6 oz wine, 1 oz liquor" <1 per month; 1-2 per month; 3 per month; 1 per week; 2 per week; 3 per week; 4 per week; 5 per week; 6 per week; 7+ per week</p>
Alpha-tocopherol, Beta-Carotene Cancer Prevention Study	<p>"As you fill in the form, please focus on your eating habits over the past 12 months: home made light beer, medium beer, strong beer, gin and grapefruit drink, spirits and other distilled liquors (vodka, rum, bitters, brandy, whisky), liqueurs." Times per day, week or month (open response) Portion size</p>
Breast Cancer Detection Demonstration Project	<p>"Have you ever drunk alcoholic beverages, such as beer, wine, or liquor regularly, that is, at least once a month?" Yes; No</p> <p>"<u>Before age 30</u>, how many beers/glasses of wine/drinks containing liquor did you <u>usually drink per week</u>?" ___ Number per week (open response); Less than one per week; Never drank beers/ wine/ liquor before age 30</p> <p>"<u>Between the ages of 30 and 50</u>, what was or has been the usual number of beers/glasses of wine/drinks containing liquor you had <u>per week</u>?" Number per week (open response); Less than one per week; Never drank beers/ wine/ liquor between the ages of 30 and 50</p>
Cohort of Swedish Men	<p>"I usually drink: Beer 2,8% alc; Beer >3,5% alc; Wine; Wine > 18% alc; Spirits 40% alc" <u>Times per month</u>: Never; 0-1; 2-3 <u>Times per week</u>: 1-2; 3-4; 5-6 <u>Times per day</u>: 1; 2; 3+</p> <p>"How much do you drink on each occasion? Beer (cl); Wine (cl); Spirits (cl)" Open response</p>

Cancer Prevention Study II	<p>“Complete the following list to reflect your USUAL eating habits over the past year (at home, in restaurants, and other places): TYPE OF FOOD: Beer (MEDIUM SERVING SIZE: 12 ounces); Wine or wine coolers (MEDIUM SERVING SIZE: 1 glass); Liquor (MEDIUM SERVING SIZE: 1 shot)” <u>YOUR SERVING SIZE: S – M – L</u></p> <p><u>AVERAGE USE LAST YEAR:</u> Never or less than once per month; 1-3 per month, 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p>
European Prospective Investigation into Cancer and Nutrition	<p>"Average use last year of: Wine (glass); Beer, lager or cider (half pint); Port, sherry, vermouth, liqueurs (glass); Spirits, e.g., Gin, brandy, whisky, vodka (single)"</p> <p>Never or less than once/month; 1-3 per month; Once a week; 2-4 per week; 5-6 per week; Once a day; 2-3 per day; 4-5 per day; 6+ per day</p>
Health Professionals Follow-Up Study	<p>“Please fill in your average use, during the past year, of each specified food. Beer (1 glass, bottle, can); Red wine (4 oz glass); White wine (4 oz glass); Liquor, e.g. whiskey, gin, etc. (1 drink or shot)”</p> <p>Never or less than one/month; 1-3 per month; 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p>
Iowa Women’s Health Study	<p>“Please fill in your average use, during the past year, of each specified food. Beer (1 glass, bottle, can); Red wine (4 oz glass); White wine (4 oz glass); Liquor, e.g. whiskey, gin, etc. (1 drink or shot)”</p> <p>Never or less than one/month; 1-3 per month; 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p>
Japan Public Health Center-based prospective Study 1	<p>"How often do you drink alcoholic beverages such as Japanese sake, shochu, awamori, beer, whisky, brandy, or wine?"</p> <p>Almost never; 1-3 days a month; 1-2 days a week; 3-4 days a week; 5-6 days a week; Every day</p> <p>"If you drink more than 1-2 days a week, how much do you drink, on average, every day? Japanese sake (go 180ml); Shochu, awamori (go 180ml),; *Beer (large 633ml bottles); Whisky (30ml cups); Others (ml). *For beer, please convert medium bottles (500ml) to 0.8 bottle and small bottles (350ml) to 0.6 bottle.”</p> <p>Open response</p>
Japan Public Health Center-based prospective Study 2	<p>“Do you drink alcoholic beverages?”</p> <p>No; I did but have stopped; Yes</p> <p>"How often do you drink Japanese sake, shochu, awamori, beer, whisky, brandy, or wine? (If you have stopped drinking, please write down how often you drank before stopping)."</p> <p>Almost never; 1-3 days a month; 1-4 days a week; Almost every day</p> <p>“On average, how much of the following do you drink every day: Japanese sake (go); shochu (go); awamori (go); beer (large) (bottles); beer (medium-500ml) (bottles); beer (small-350ml) (bottles); wine (glasses); whiskey, brandy, or vodka (cups)? (If you have stopped drinking, please write down how often you drank before stopping).”</p> <p>Open response</p>
Melbourne Collaborative Cohort Study	<p>"Between the ages of __ - __ did you drink beer/wine/drinks containing spirits? Age ranges: 10-14, 15-19, 20-29, 30-39, 40-49, 50-59, 60-69”</p> <p>Yes; No</p> <p>“How often did you drink beer/wine/drinks containing spirits?”</p> <p>Open response (per day, week, month, or year)</p> <p>“When you drank beer/wine/drinks containing spirits, how much did you drink on average?”</p> <p>Open response (glasses, pots, cans, stubbies, bottles [beer]; glasses, bottles, litres [wine]; glasses [spirits])</p>

Multiethnic Cohort Study	<p>"Alcoholic and other beverages: Regular or Draft Beer; Light Beer; White or Pink Wine (includes champagne and sake); Red Wine; Hard Liquor (such as bourbon, scotch, gin, vodka, tequila, rum, cocktails). Average use during last year:"</p> <p>Never or hardly ever; Once a month; 2 to 3 times a month; Once a week; 2 to 3 times a week; 4 to 6 times a week; Once a day; 2 to 3 times a day; 4 or more times a day</p> <p>"Your usual serving size:"</p> <p><u>Regular beer</u>: 1 can or bottle or less; 2 cans or bottles; 3 cans or bottles; 4 cans or bottles or more</p> <p><u>Light beer</u>: 1 can or bottle or less; 2 cans or bottles; 3 cans or bottles; 4 cans or bottles or more</p> <p><u>White wine</u>: 1 glass or less; 2 glasses; 3 glasses; 4 glasses or more</p> <p><u>Red wine</u>: 1 glass or less; 2 glasses; 3 glasses; 4 glasses or more</p> <p><u>Hard liquor</u>: 1 drink or less; 2 drinks; 3 drinks; 4 drinks or more</p>
Nurses' Health Study	<p>"Please fill in your average use, during the past year, of each specified food. Beer (bottles or cans); Wine (glasses); Liquor, e.g. whiskey, gin, etc. (drinks)"</p> <p>Almost never; 1-3 per month; 1 per week, 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p>
National Institutes of Health-American Association of Retired Persons Diet and Health Study	<p>"Over the last 12 months, how often did you eat the following foods (ignore any recent changes: beer (in summer)? Beer (rest of the year)? Wine or wine coolers? Liquor or mixed drinks?"</p> <p>Never; 1 time per month or less; 2-3 times per month; 1-2 times per week; 3-4 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6+ times per day</p> <p>"What was your portion size?"</p> <p><u>Beer</u>: Less than a 12-ounce can; 1 to 2 12 ounce cans; More than 2 12 ounce cans</p> <p><u>Wine or wine coolers</u>: Less than 4 ounces; 4 to 8 ounces; More than 8 ounces</p> <p><u>Liquor or mixed drinks</u>: Less than 1 shot of liquor; 1 to 2 shots of liquor; More than 2 shots of liquor</p>
New York University Women's Health Study	<p>"ABOUT TEN YEARS AGO, approximately how many cans or bottles of beer did you usually drink in a week? (If less than one, write '0')"</p> <p>Open response</p> <p>"ABOUT TEN YEARS AGO, approximately how many 4-ounce glasses of wine did you usually drink in a week? (If less than one, write '0')"</p> <p>Open response</p> <p>"ABOUT TEN YEARS AGO, approximately how many 1-ounce glasses (shots) of liquor did you usually drink in a week? (If less than one, write '0')"</p> <p>Open response</p>
Physicians' Health Study	<p>"How often do you consume alcoholic beverages (beer, wine, liquor)?"</p> <p>2+/day; Daily; 5-6/wk; 2-4/wk; 1/wk; 1-3/mo; Rarely/never</p>

Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial	<p>“Over the past 12 months did you drink beer?” Yes; No</p> <p>“How often did you drink beer IN THE SUMMER?” Never; 1 time per month or less; 1-2 times per week; 3-4 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6 or more times per day</p> <p>“How often did you drink beer DURING THE REST OF THE YEAR?” Never; 1 time per month or less; 1-2 times per week; 3-4 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6 or more times per day</p> <p>“Over the past 12 months . . . how often did you drink wine or wine coolers? Liquor or mixed drinks?” Never; 1 time per month or less; 1-2 times per week; 3-4 times per week; 1 time per day; 2-3 times per day; 4-5 times per day; 6 or more times per day</p> <p>“Each time you drank beer / wine or wine coolers / liquor or mixed drinks, how much did you usually drink?” <u>Beer</u>: Less than a 12-ounce can or bottle; 1 to 3 12-ounce cans or bottles; More than 3 12-ounce cans or bottles <u>Wine/wine coolers</u>: Less than 5 ounces or less than 1 glass; 5 to 12 ounces or 1 to 2 glasses; More than 12 ounces or more than 2 glasses <u>Liquor or mixed drinks</u>: Less than 1 shot of liquor; 1 to 3 shots of liquor; More than 3 shots of liquor</p>
Radiation Effects Research Foundation Life Span Study	<p>“Do you drink any alcoholic beverage?” No; Yes</p> <p>“Sake per week” Open response</p> <p>“Shochu per week” Open response</p> <p>“Beer per week” Open response</p> <p>“Whiskey per week” Open response</p>
Singapore Chinese Health Study	<p>"ALCOHOLIC BEVERAGES: Beer, Rice wine, Other wine, Hard liquor. AVERAGE USE DURING LAST YEAR:" Never or hardly ever; Once a month; 2 to 3 times a month; Once a week; 2 to 3 times a week; 4 to 6 times a week; Once a day; 2 or more times a day</p> <p>“SUBJECT'S USUAL SERVING SIZE:” <u>Beer</u>: 1 small bottle (375 ml) or less; 2 small bottles or 1 large bottle (750 ml); 2 large bottles; 3 large bottles <u>Rice wine</u>: 1 wine cup (30 ml) or less; 2 wine cups; 3 wine cups; 4 wine cups or more <u>Other wine</u>: 1 wine glass (118 ml) or less; 2 wine glasses; 3 wine glasses; 4 wine glasses or more <u>Hard liquor</u>: 1 drink (30 ml) or less; 2 drinks; 3 drinks ; 4 drinks or more</p>

Shanghai Cohort Study	<p>"Have you ever drunk beer, wine, or spirits at least once a week for 6 months or longer?" Yes; No</p> <p>"During the years you were drinking at least once a week, how many times per week did you drink beer on average?" Open response</p> <p>"And how many liang did you drink each time?" Open response</p> <p>"On the average, how many times per week did you drink wine such as rice wine and fruit wine?" Open response</p> <p>"And how many liang did you drink each time?" Open response</p> <p>"On the average, how many times per week did you drink spirits such as white liquor?" Open response</p> <p>"And how many liang did you drink each time?" Open response</p> <p>"ALCOHOLIC BEVERAGES: Beer, Rice wine, Other wine, Hard liquor. AVERAGE USE DURING LAST YEAR:" Never or hardly ever; Once a month; 2 to 3 times a month; Once a week; 2 to 3 times a week; 4 to 6 times a week; Once a day; 2 or more times a day</p> <p>"SUBJECT'S USUAL SERVING SIZE:" <u>Beer</u>: 1 small bottle (375 ml) or less; 2 small bottles or 1 large bottle (750 ml); 2 large bottles; 3 large bottles <u>Rice wine</u>: 1 wine cup (30 ml) or less; 2 wine cups; 3 wine cups; 4 wine cups or more <u>Other wine</u>: 1 wine glass (118 ml) or less; 2 wine glasses; 3 wine glasses; 4 wine glasses or more <u>Hard liquor</u>: 1 drink (30 ml) or less; 2 drinks; 3 drinks ; 4 drinks or more</p>
Sister Study	<p>"Have you ever had an alcohol beverage?" Yes; No</p> <p>"Have you had an alcoholic beverage in the past 12 months?" Yes; No</p> <p>"During the past 12 months, about how many days per week, per month, or in total have you had alcoholic beverages?" Open response, days per week, per month, or total for past 12 months</p> <p>"During the past 12 months, about how many drinks would you have on the days that you drank?" Open response</p>

Swedish Mammography Cohort	<p>"I usually drink: Beer 2,8% alc; Beer >3,5% alc; Wine; Wine > 18% alc; Spirits 40% alc"</p> <p><u>Times per month</u>: Never; 0-1; 2-3</p> <p><u>Times per week</u>: 1-2; 3-4; 5-6</p> <p><u>Times per day</u>: 1; 2; 3+</p> <p>"How much do you drink on each occasion? Beer (cl); Wine (cl); Spirits (cl)"</p> <p>Open response</p>
VITamins and Lifestyle Study	<p>"How often did you drink these beverages last year? Beer (all types); Red wine; White or rose wine; Liquor and mixed drinks; Medium serving size: Beer = 12-ounce can or bottle; Red wine = 1 medium glass (4 oz); White or rose wine = 1 medium glass (4 oz); Liquor and mixed drinks = 1 shot (1 1/2 oz) or 1 mixed drink"</p> <p>Never or less than once per month; 1-3 per month; 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p> <p>"Amount?"</p> <p>S – M – L</p>
Women's Health Initiative	<p>"During your entire life, have you had at least 12 drinks of any kind of alcoholic beverage?"</p> <p>No; Yes</p> <p>"During the last three (3) months . . . how often did you eat these foods? Beer (medium serving size = 12 ounce can or bottle); Wine (medium serving size = 1 medium glass [6 ounces]); Liquor (medium serving size = 1 shot [1 1/2 ounces])"</p> <p>Never or less than once per month; 1-3 per month; 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p> <p>"Your serving size:"</p> <p>S – M – L</p>
Women's Health Study	<p>"Please record your average consumption of the following beverages over the LAST YEAR: Beer (1 glass, bottle, can); Red wine (include sherry, port) (4 oz. glass); White wine (4 oz. glass); Liquor (e.g. vodka, rum, gin, liqueur, brandy) (one drink or shot)"</p> <p>Never or less than one/month; 1-3 per month; 1 per week; 2-4 per week; 5-6 per week; 1 per day; 2-3 per day; 4-5 per day; 6+ per day</p>
Women's Lifestyle and Health Study	<p>"How much alcohol do you drink per week, month or year? Class II beer (1 glass = 2 dl); Class III beer (1 glass = 2 dl); Wine (1 glass = 1 dl); Fortified wine (1 glass = 4cl); Distilled spirits (1 glass = 4 cl)"</p> <p>Open response: Glass/week, Glass/month, Glass/year</p> <p>"I drink alcoholic beverages seldom or not at all."</p> <p>Checkbox</p>

*Many studies collected additional information on alcohol consumption. The information provided in this table reflects the data that were used for this analysis only.

Supplementary Table 4. Adjusted hazard ratios (HR) and 95% confidence intervals (CI) for associations of cigarette smoking and alcohol consumption with biliary tract cancer risk by anatomic site in the Biliary Tract Cancers Pooling Project – estimates from the pooled dataset

Exposure	No. of noncases ^{†‡}	Gallbladder Cancer		Intrahepatic Bile Duct Cancer		Extrahepatic Bile Duct Cancer		Ampulla of Vater Cancer	
		No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)
Cigarette smoking									
Ever Smoking									
No	1,084,270	596	Reference	263	Reference	348	Reference	189	Reference
Yes	1,191,039	493	1.02 (0.89 to 1.16)	315	1.12 (0.93 to 1.33)	541	1.41 (1.22 to 1.63)	317	1.45 (1.20 to 1.76)
Smoking status									
Never smoker	1,084,270	596	Reference	263	Reference	348	Reference	189	Reference
Former smoker	827,061	332	0.97 (0.84 to 1.12)	211	1.05 (0.86 to 1.28)	351	1.29 (1.10 to 1.52)	209	1.30 (1.05 to 1.61)
Current smoker	362,313	161	1.12 (0.93 to 1.35)	104	1.27 (1.00 to 1.62)	190	1.68 (1.39 to 2.03)	108	1.84 (1.43 to 2.37)
Smoking pack-years									
Never Smoker	984,603	545	Reference	246	Reference	333	Reference	174	Reference
>0 – 20	385,482	165	0.91 (0.76 to 1.10)	78	0.90 (0.68 to 1.17)	146	1.13 (0.92 to 1.39)	94	1.32 (1.01 to 1.71)
>20 – 40	223,798	112	1.11 (0.90 to 1.37)	76	1.30 (0.98 to 1.71)	126	1.46 (1.17 to 1.81)	72	1.55 (1.16 to 2.07)
>40	148,402	68	1.07 (0.82 to 1.39)	48	1.21 (0.87 to 1.69)	93	1.60 (1.25 to 2.06)	46	1.42 (1.00 to 2.00)
<i>P</i> -trend [§]			0.52		0.08		<0.001		0.006
Continuous per 10 pack-years			1.02 (0.98 to 1.06)		1.05 (1.00 to 1.10)		1.08 (1.04 to 1.12)		1.05 (1.00 to 1.10)
Smoking Duration, years									
Never smoker	1,070,496	594	Reference	258	Reference	345	Reference	187	Reference
>0 – 10	164,873	56	0.87 (0.66 to 1.15)	41	1.22 (0.87 to 1.72)	51	1.19 (0.88 to 1.61)	30	1.18 (0.79 to 1.74)
>10 – 20	194,455	57	0.78 (0.59 to 1.03)	39	0.97 (0.68 to 1.37)	56	1.01 (0.75 to 1.35)	37	1.21 (0.84 to 1.74)
>20 – 40	501,925	227	1.08 (0.92 to 1.28)	128	1.03 (0.82 to 1.30)	225	1.27 (1.06 to 1.52)	126	1.30 (1.02 to 1.65)
>40	127,389	64	0.90 (0.69 to 1.17)	41	1.14 (0.80 to 1.61)	93	1.71 (1.33 to 2.18)	55	1.84 (1.34 to 2.53)
<i>P</i> -trend [§]			1.0		0.64		<0.001		<0.001
Continuous per 10 years			1.00 (0.96 to 1.04)		1.00 (0.94 to 1.06)		1.09 (1.04 to 1.14)		1.12 (1.05 to 1.18)
Smoking Intensity, cigarettes/day									
Never smoker	984,603	545	Reference	246	Reference	333	Reference	174	Reference
>0 – 10	316,037	166	1.05 (0.88 to 1.26)	60	0.82 (0.61 to 1.10)	128	1.19 (0.97 to 1.47)	87	1.44 (1.11 to 1.88)
>10 – 20	336,669	151	1.06 (0.87 to 1.28)	108	1.31 (1.03 to 1.67)	185	1.56 (1.29 to 1.89)	97	1.49 (1.15 to 1.94)
>20 – 40	230,576	91	1.07 (0.83 to 1.34)	77	1.43 (1.08 to 1.89)	135	1.77 (1.42 to 2.21)	78	1.73 (1.29 to 2.31)
>40	46,656	17	1.08 (0.66 to 1.77)	19	1.63 (0.99 to 2.66)	24	1.54 (0.99 to 2.40)	13	1.32 (0.72 to 2.41)
<i>P</i> -trend [§]			0.48		0.002		<0.001		<0.001
Continuous per 10 cigarettes			1.02 (0.97 to 1.09)		1.11 (1.04 to 1.19)		1.15 (1.09 to 1.21)		1.12 (1.04 to 1.20)
Alcohol consumption									
Alcoholic Drinks/Day									
0	716,188	456	Reference	230	Reference	326	Reference	161	Reference

>0 – 0.5	865,648	408	1.05 (0.90 to 1.21)	173	0.82 (0.66 to 1.01)	292	0.92 (0.77 to 1.09)	181	1.12 (0.90 to 1.41)
>0.5 – <1	269,152	99	0.97 (0.77 to 1.23)	59	0.77 (0.57 to 1.04)	103	1.05 (0.83 to 1.33)	52	0.90 (0.65 to 1.26)
1 – <3	338,965	112	0.90 (0.72 to 1.13)	95	0.87 (0.67 to 1.13)	140	0.93 (0.75 to 1.16)	95	1.19 (0.90 to 1.57)
3 – <5	110,675	29	0.81 (0.51 to 1.28)	56	1.17 (0.79 to 1.73)	67	1.12 (0.80 to 1.56)	32	1.04 (0.63 to 1.73)
≥5	42,166	9	0.64 (0.33 to 1.24)	24	1.55 (1.00 to 2.41)	22	0.92 (0.59 to 1.43)	14	1.25 (0.71 to 2.20)
<i>P</i> -trend [§]			0.13		0.44		0.99		0.41
Continuous per 1 drink			0.95 (0.90 to 1.01)		1.02 (1.00 to 1.05)		1.01 (0.98 to 1.04)		0.99 (0.93 to 1.04)

*Adjusted for sex (male, female), race (white, black, Asian and Pacific Islander, other), education (<high school graduate, high school graduate, some college or post-high school training), body mass index in kg/m² (<18.5, 18.5-<25, 25-<30, ≥30), history of diabetes (ever vs never diagnosed), and birth cohort (1870-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1982). Smoking models were additionally adjusted for alcoholic drinks per day (0, >0-0.5, >0.5-1, 1-<3, ≥3). Alcohol models were additionally adjusted for smoking status (never, former, current). HR=Hazard ratio; CI=Confidence interval.

[†]No. of noncases: The same noncase group was used for all analyses, except for analyses of intrahepatic bile duct cancer. The Radiation Effects Research Foundation Life Span Study (RERF) did not provide information on intrahepatic bile duct cancer diagnoses, so this study was excluded from these analyses and the maximum noncase group was thus n=2,267,574.

[‡]No. of noncases and No. of cases: Some counts do not add to totals due to missing data.

[§]*P*-trend: Two-sided *P*-value for the ordinal variable, calculated using the Wald test.

Supplementary Table 5. Adjusted hazard ratios (HR) and 95% confidence intervals (CI) for associations of cigarette smoking and alcohol consumption with biliary tract cancer risk by anatomic site in the Biliary Tract Cancers Pooling Project – estimates from the pooled dataset, restricted to ever smokers / participants who consumed >0 alcoholic drinks per day*

Exposure	No. of non cases ^{†‡}	Gallbladder Cancer		Intrahepatic Bile Duct Cancer		Extrahepatic Bile Duct Cancer		Ampulla of Vater Cancer	
		No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)
Cigarette smoking									
Smoking Pack-years									
>0 – 20	385,482	165	Reference	78	Reference	146	Reference	94	Reference
>20 – 40	223,798	112	1.20 (0.94 to 1.54)	76	1.49 (1.07 to 2.08)	126	1.32 (1.03 to 1.69)	72	1.16 (0.84 to 1.60)
>40	148,402	68	1.17 (0.87 to 1.58)	48	1.50 (1.02 to 2.20)	93	1.51 (1.15 to 2.00)	46	1.06 (0.72 to 1.56)
<i>P</i> -trend [§]			0.21		0.02		0.002		0.64
Continuous per 10 pack-years			1.03 (0.98 to 1.08)		1.07 (1.01 to 1.14)		1.08 (1.03 to 1.14)		1.01 (0.95 to 1.08)
Smoking Duration, years									
>0 – 10	164,870	56	Reference	41	Reference	51	Reference	30	Reference
>10 – 20	194,455	57	0.88 (0.61 to 1.28)	39	0.80 (0.51 to 1.25)	56	0.85 (0.58 to 1.24)	37	0.98 (0.61 to 1.61)
>20 – 40	501,925	227	1.28 (0.95 to 1.74)	128	0.88 (0.61 to 1.28)	225	1.10 (0.80 to 1.51)	126	1.10 (0.72 to 1.67)
>40	127,389	64	1.10 (0.75 to 1.62)	41	1.01 (0.63 to 1.62)	93	1.48 (1.03 to 2.14)	55	1.52 (0.94 to 2.46)
<i>P</i> -trend [§]			0.14		0.94		0.01		0.08
Continuous per 10 years			1.04 (0.96 to 1.13)		0.97 (0.88 to 1.08)		1.10 (1.01 to 1.19)		1.11 (1.00 to 1.24)
Smoking Intensity, cigarettes/day									
>0 – 10	315,983	166	Reference	60	Reference	128	Reference	87	Reference
>10 – 20	336,634	151	0.97 (0.77 to 1.22)	108	1.63 (1.18 to 2.26)	185	1.30 (1.03 to 1.64)	97	1.01 (0.75 to 1.36)
>20 – 40	230,554	91	0.97 (0.74 to 1.28)	77	1.80 (1.26 to 2.57)	135	1.52 (1.17 to 1.96)	78	1.19 (0.86 to 1.66)
>40	46,656	17	0.97 (0.58 to 1.64)	19	2.08 (1.21 to 3.59)	24	1.35 (0.85 to 2.14)	13	0.92 (0.49 to 1.72)
<i>P</i> -trend [§]			0.83		<0.001		0.004		0.52
Continuous per 10 cigarettes			1.00 (0.92 to 1.08)		1.13 (1.03 to 1.23)		1.11 (1.04 to 1.19)		1.04 (0.94 to 1.14)
Alcohol consumption									
Alcoholic Drinks/Day									
>0 – 0.5	865,648	408	Reference	173	Reference	292	Reference	181	Reference
>0.5 – <1	269,152	99	0.92 (0.73 to 1.15)	59	0.95 (0.70 to 1.29)	103	1.12 (0.88 to 1.41)	52	0.78 (0.56 to 1.08)
1 – <3	338,965	112	0.86 (0.69 to 1.08)	95	1.05 (0.80 to 1.37)	140	1.00 (0.80 to 1.24)	95	1.04 (0.80 to 1.36)
3 – <5	68,509	20	0.75 (0.47 to 1.20)	32	1.40 (0.93 to 2.11)	45	1.13 (0.80 to 1.59)	18	0.91 (0.55 to 1.50)
≥5	42,166	9	0.61 (0.31 to 1.19)	24	1.85 (1.18 to 2.91)	22	0.95 (0.61 to 1.50)	14	1.10 (0.63 to 1.92)
<i>P</i> -trend [§]			0.04		0.02		0.90		0.86
Continuous per 1 drink			0.95 (0.89 to 1.01)		1.02 (1.00 to 1.05)		1.01 (0.98 to 1.04)		0.98 (0.92 to 1.03)

*Adjusted for sex (male, female), race (white, black, Asian and Pacific Islander, other), education (<high school graduate, high school graduate, some college or post-high school training), body mass index index kg/m² (<18.5, 18.5-<25, 25-<30, ≥30), history of diabetes (ever vs never diagnosed), and birth cohort (1870-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1982). Smoking models were additionally adjusted for alcoholic drinks per day (0, >0-0.5, >0.5-1, 1-<3, ≥3). Alcohol models were additionally adjusted for smoking status (never, former, current). HR=Hazard ratio; CI=Confidence interval.

[†]No. of noncases: The same noncase group was used for all analyses, except for analyses of intrahepatic bile duct cancer. The Radiation Effects Research Foundation Life Span Study (RERF) did not provide information on intrahepatic bile duct cancer diagnoses, so this study was excluded from these analyses and the maximum noncase group was thus n=742,860.

[‡]No. of noncases and No. of cases: Some counts do not add to totals due to missing data.

[§]*P*-trend: Two-sided *P*-value for the ordinal variable, calculated using the Wald test.

Supplementary Table 6. Adjusted hazard ratios (HR) and 95% confidence intervals (CI) for associations of cigarette smoking intensity and duration with biliary tract cancer risk by anatomic site in the Biliary Tract Cancers Pooling Project – estimates from the pooled dataset, adjusting for total exposure (i.e., smoking pack-years) *

Cigarette smoking	No. of non cases ^{†‡}	Gallbladder Cancer		Intrahepatic Bile Duct Cancer		Extrahepatic Bile Duct Cancer		Ampulla of Vater Cancer	
		No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)
Smoking Duration (years) [§]									
Never smoker	984,603	545	Reference	246	Reference	333	Reference	174	Reference
>0 – 10	106,525	39	0.82 (0.51 to 1.31)	29	1.88 (1.03 to 3.46)	40	1.60 (1.00 to 2.54)	24	1.14 (0.62 to 2.11)
>10 – 20	135,772	49	0.89 (0.57 to 1.37)	26	1.27 (0.71 to 2.26)	46	1.35 (0.87 to 2.08)	27	1.04 (0.58 to 1.85)
>20 – 40	405,426	199	1.14 (0.85 to 1.52)	109	1.20 (0.84 to 1.73)	197	1.46 (1.11 to 1.93)	111	1.18 (0.80 to 1.75)
>40	109,959	58	0.97 (0.70 to 1.34)	38	1.27 (0.85 to 1.91)	82	1.84 (1.37 to 2.47)	50	1.68 (1.12 to 2.50)
<i>P</i> -trend			0.30		0.25		0.40		0.14
Continuous per 10 years			1.01 (0.92 to 1.12)		0.87 (0.75 to 1.00)		1.00 (0.91 to 1.12)		1.12 (0.98 to 1.28)
Smoking Intensity (cigarettes/day)									
Never smoker	984,603	545	Reference	246	Reference	333	Reference	174	Reference
>0 – 10	270,294	137	1.22 (0.75 to 1.98)	51	0.81 (0.43 to 1.52)	102	1.43 (0.90 to 2.29)	74	2.06 (1.07 to 3.95)
>10 – 20	280,043	124	1.05 (0.71 to 1.57)	88	1.16 (0.69 to 1.94)	155	1.78 (1.22 to 2.59)	83	1.75 (1.02 to 2.99)
>20 – 40	176,509	72	1.05 (0.78 to 1.41)	51	1.18 (0.82 to 1.70)	92	1.59 (1.21 to 2.09)	48	1.38 (0.95 to 2.02)
>40	30,836	12	1.12 (0.62 to 2.00)	12	1.56 (0.85 to 2.84)	16	1.54 (0.90 to 2.62)	7	1.00 (0.44 to 2.29)
<i>P</i> -trend			0.56		0.12		0.71		0.13
Continuous per 10 cigarettes			1.01 (0.88 to 1.16)		1.11 (0.96 to 1.30)		1.02 (0.89 to 1.15)		0.87 (0.72 to 1.06)

*Adjusted for sex (male, female), race (white, black, Asian and Pacific Islander, other), education (<high school graduate, high school graduate, some college or post-high school training), body mass index in kg/m² (<18.5, 18.5-<25, 25-<30, ≥30), history of diabetes (ever vs never diagnosed), birth cohort (1870-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1982), alcoholic drinks per day (0, >0-0.5, >0.5-1, 1-<3, ≥3), and smoking pack-years (0, >0-20, >20-40, >40). HR=Hazard ratio; CI=Confidence interval.

[†]No. of noncases: The same noncase group was used for all analyses, except for analyses of intrahepatic bile duct cancer. The Radiation Effects Research Foundation Life Span Study (RERF) did not provide information on intrahepatic bile duct cancer diagnoses, so this study was excluded from these analyses and the maximum noncase group was thus n=1,709,329.

[‡]No. of noncases and No. of cases: Some counts do not add to totals due to missing data.

[§]For cigarette smoking duration, these estimates are limited to the 21 studies that had both cigarette smoking duration and pack-years. In the overall pooled analysis (Supplemental Table 5), smoking duration results are shown for all 25 studies containing information on smoking duration. However, when we restricted the overall analyses of smoking duration to only the 21 studies that are included when we additionally adjust for smoking pack-years, the results were consistent (data not shown).

^{||}*P*-trend: Two-sided *P*-value for the ordinal variable, calculated using the Wald test.

Supplementary Table 7. Adjusted hazard ratios (HR) and 95% confidence intervals (CI) for associations of cigarette smoking status with extrahepatic and intrahepatic bile duct cancer risk stratified by race in the Biliary Tract Cancers Pooling Project – estimates from the pooled dataset*

Cancer Site / Cigarette Smoking Status	Whites (n=612 cases/1,913,514 noncases)	Blacks (n=35 cases/86,886 noncases)	Asians and Pacific Islanders (n=241 cases/239,571 noncases)	Other Races (n=35 cases/60,189 noncases)
	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
Extrahepatic Bile Duct Cancer				
Smoking Status				
Never smoker	Reference	Reference	Reference	Reference
Former smoker	1.41 (1.16 to 1.71)	1.38 (0.63 to 3.02)	1.08 (0.75 to 1.57)	0.72 (0.34 to 1.55)
Current smoker	2.01 (1.58 to 2.57)	1.86 (0.70 to 4.97)	1.22 (0.86 to 1.74)	0.52 (0.15 to 1.81)
Intrahepatic Bile Duct Cancer	(n=457 cases/1,913,514 noncases)	(n=13 cases/86,886 noncases)	(n=121 cases/206,444 noncases)	(n=20 cases/60,189 noncases)
Smoking Status				
Never smoker	Reference	Reference	Reference	Reference
Former smoker	1.07 (0.86 to 1.33)	0.38 (0.09 to 1.51)	0.86 (0.49 to 1.51)	2.33 (0.82 to 6.61)
Current smoker	1.13 (0.83 to 1.53)	0.89 (0.17 to 4.56)	1.45 (0.89 to 2.33)	1.95 (0.46 to 8.16)

*Adjusted for sex (male, female), race (white, black, Asian and Pacific Islander, other), education (<high school graduate, high school graduate, some college or post-high school training), body mass index in kg/m² (<18.5, 18.5-<25, 25-<30, ≥30), history of diabetes (ever vs never diagnosed), and birth cohort (1870-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1982). Smoking models were additionally adjusted for alcoholic drinks per day (0, >0-0.5, >0.5-1, 1-<3, ≥3). HR=Hazard ratio; CI=Confidence interval.

Supplementary Table 8. Adjusted hazard ratios (HR) and 95% confidence intervals (CI) for associations of cigarette smoking and alcohol consumption with biliary tract cancer risk by anatomic site in the Biliary Tract Cancers Pooling Project – estimates from the pooled dataset, restricted to 17 studies with information on gallstones.*

Exposure	No. of noncases ^{†‡}	Gallbladder Cancer				Intrahepatic Bile Duct Cancer			
		Standard Adjustments		Standard Adjustments + Adjustment for Gallstones		Standard Adjustments		Standard Adjustments + Adjustment for Gallstones	
		No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)	No. of cases [‡]	HR (95% CI)
Cigarette smoking									
Ever Smoking									
No	873,738	417	Reference	405	Reference	215	Reference	197	Reference
Yes	1,023,429	406	1.06 (0.91 to 1.22)	381	1.02 (0.87 to 1.18)	271	1.08 (0.89 to 1.31)	259	1.08 (0.88 to 1.32)
Smoking Status									
Never smoker	873,738	417	Reference	405	Reference	215	Reference	197	Reference
Former smoker	724,212	293	1.03 (0.87 to 1.20)	281	1.00 (0.85 to 1.18)	190	1.04 (0.84 to 1.29)	185	1.05 (0.84 to 1.30)
Current smoker	296,842	113	1.14 (0.92 to 1.42)	100	1.08 (0.86 to 1.35)	81	1.19 (0.91 to 1.57)	74	1.17 (0.88 to 1.55)
Smoking Pack-years									
Never smoker	807,562	378	Reference	366	Reference	203	Reference	185	Reference
>0 – 20	333,132	134	0.95 (0.77 to 1.16)	129	0.93 (0.75 to 1.15)	65	0.83 (0.62 to 1.12)	62	0.82 (0.61 to 1.12)
>20 – 40	191,569	81	1.08 (0.84 to 1.39)	76	1.04 (0.81 to 1.35)	63	1.26 (0.93 to 1.71)	59	1.21 (0.88 to 1.66)
>40	132,353	58	1.16 (0.87 to 1.55)	56	1.12 (0.83 to 1.51)	42	1.20 (0.84 to 1.72)	42	1.19 (0.83 to 1.70)
<i>P</i> -trend [§]			0.35		0.55		0.17		0.23
Continuous per 10 pack-years			1.02 (0.98 to 1.07)		1.02 (0.97 to 1.06)		1.05 (1.00 to 1.10)		1.05 (1.00 to 1.10)
Smoking Duration (years)									
Never smoker	859,964	415	Reference	403	Reference	210	Reference	192	Reference
>0 – 10	132,393	46	0.89 (0.65 to 1.22)	42	0.85 (0.61 to 1.17)	32	1.11 (0.76 to 1.64)	29	1.10 (0.73 to 1.65)
>10 – 20	161,384	47	0.81 (0.59 to 1.10)	44	0.79 (0.57 to 1.08)	37	1.05 (0.73 to 1.51)	35	1.08 (0.74 to 1.57)
>20 – 40	432,257	180	1.09 (0.99 to 1.32)	166	1.04 (0.86 to 1.26)	105	0.96 (0.74 to 1.23)	99	0.94 (0.73 to 1.23)
>40	109,041	51	1.02 (0.75 to 1.37)	48	0.97 (0.71 to 1.32)	33	1.10 (0.75 to 1.61)	33	1.13 (0.77 to 1.66)
<i>P</i> -trend [§]			0.59		1.00		0.99		0.97
Continuous per 10 years			1.01 (0.97 to 1.06)		1.00 (0.95 to 1.05)		0.99 (0.92 to 1.05)		0.99 (0.92 to 1.05)
Smoking Intensity (cigarettes/day)									
Never smoker	807,562	366	Reference	354	Reference	203	Reference	185	Reference
>0 – 10	278,546	125	1.04 (0.85 to 1.29)	119	1.04 (0.84 to 1.28)	48	0.74 (0.53 to 1.02)	45	0.72 (0.51 to 1.01)
>10 – 20	286,878	118	1.11 (0.89 to 1.38)	114	1.11 (0.89 to 1.38)	91	1.28 (0.98 to 1.67)	87	1.24 (0.95 to 1.64)
>20 – 40	210,291	78	1.11 (0.81 to 1.44)	75	1.04 (0.80 to 1.35)	73	1.46 (1.09 to 1.96)	73	1.45 (1.07 to 1.95)
>40	44,070	14	0.98 (0.57 to 1.69)	14	1.02 (0.60 to 1.74)	18	1.65 (0.99 to 2.75)	18	1.60 (0.96 to 2.67)
<i>P</i> -trend [§]			0.37		0.56		0.002		0.003
Continuous per 10 cigarettes			1.02 (0.96 to 1.09)		1.02 (0.96 to 1.09)		1.12 (1.04 to 1.20)		1.11 (1.03 to 1.19)
Alcohol consumption									
Alcoholic Drinks/Day									
0	543,371	302	Reference	296	Reference	168	Reference	159	Reference
>0 – 0.5	738,752	318	1.04 (0.87 to 1.23)	300	1.04 (0.87 to 1.24)	156	0.87 (0.69 to 1.10)	145	0.88 (0.69 to 1.12)

>0.5 – <1	230,357	88	1.03 (0.80 to 1.33)	81	1.02 (0.79 to 1.33)	54	0.88 (0.64 to 1.23)	48	0.86 (0.61 to 1.21)
1 – <3	305,055	102	0.94 (0.74 to 1.20)	96	0.94 (0.73 to 1.21)	87	0.96 (0.72 to 1.28)	83	0.97 (0.72 to 1.30)
3 – <5	64,882	20	0.86 (0.54 to 1.38)	20	0.91 (0.57 to 1.45)	32	1.31 (0.88 to 1.97)	32	1.34 (0.89 to 2.01)
≥5	40,359	8	0.59 (0.29 to 1.20)	8	0.61 (0.30 to 1.25)	24	1.73 (1.10 to 2.71)	24	1.73 (1.10 to 2.72)
<i>P</i> -trend [§]			0.30		0.37		0.07		0.06
Continuous per 1 drink			0.96 (0.90 to 1.01)		0.96 (0.90 to 1.02)		1.03 (1.00 to 1.05)		1.03 (1.00 to 1.05)

Extrahepatic Bile Duct Cancer

Ampulla of Vater Cancer

Cigarette smoking

Ever Smoking

No	873,738	261	Reference	251	Reference	149	Reference	145	Reference
Yes	1,023,429	449	1.39 (1.18 to 1.64)	438	1.40 (1.18 to 1.65)	271	1.40 (1.13 to 1.73)	258	1.35 (1.09 to 1.67)

Smoking Status

Never smoker	873,738	261	Reference	251	Reference	149	Reference	145	Reference
Former smoker	725,212	313	1.32 (1.10 to 1.57)	310	1.34 (1.12 to 1.60)	188	1.25 (1.00 to 1.57)	183	1.23 (0.97 to 1.54)
Current smoker	296,842	136	1.61 (1.29 to 2.01)	128	1.58 (1.26 to 1.99)	83	1.87 (1.42 to 2.49)	75	1.76 (1.32 to 2.36)

Smoking Pack-years

Never smoker	807,562	253	Reference	243	Reference	137	Reference	133	Reference
>0 – 20	333,132	117	1.09 (0.86 to 1.37)	113	1.06 (0.84 to 1.34)	76	1.23 (0.92 to 1.66)	72	1.17 (0.87 to 1.59)
>20 – 40	191,569	98	1.41 (1.10 to 1.80)	96	1.39 (1.08 to 1.79)	56	1.48 (1.07 to 2.05)	54	1.43 (1.02 to 1.99)
>40	132,353	75	1.51 (1.15 to 2.00)	72	1.45 (1.09 to 1.92)	41	1.37 (0.94 to 2.00)	40	1.30 (0.89 to 1.91)
<i>P</i> -trend [§]			0.001		0.002		0.02		0.05
Continuous per 10 pack-years			1.07 (1.03 to 1.11)		1.06 (1.02 to 1.10)		1.05 (1.00 to 1.10)		1.04 (0.99 to 1.10)

Smoking Duration (years)

Never smoker	859,964	258	Reference	248	Reference	147	Reference	143	Reference
>0 – 10	132,393	44	1.22 (0.88 to 1.70)	44	1.28 (0.92 to 1.79)	25	1.10 (0.71 to 1.69)	21	0.94 (0.59 to 1.51)
>10 – 20	161,384	44	0.94 (0.68 to 1.31)	44	0.98 (0.71 to 1.37)	27	1.00 (0.65 to 1.52)	27	1.02 (0.67 to 1.56)
>20 – 40	432,257	177	1.20 (0.98 to 1.48)	169	1.18 (0.95 to 1.45)	105	1.24 (0.95 to 1.62)	100	1.20 (0.91 to 1.57)
>40	109,041	72	1.77 (1.34 to 2.33)	69	1.72 (1.30 to 2.29)	46	1.88 (1.33 to 2.67)	43	1.76 (1.23 to 2.52)
<i>P</i> -trend [§]			0.002		0.004		0.003		0.01
Continuous per 10 years			1.09 (1.03 to 1.15)		1.08 (1.03 to 1.14)		1.11 (1.04 to 1.19)		1.10 (1.03 to 1.18)

Smoking Intensity

(cigarettes/day)

Never smoker	807,562	253	Reference	243	Reference	137	Reference	133	Reference
>0 – 10	278,546	104	1.19 (0.94 to 1.50)	101	1.17 (0.92 to 1.49)	72	1.41 (1.05 to 1.89)	69	1.37 (1.02 to 1.85)
>10 – 20	286,878	148	1.52 (1.22 to 1.88)	145	1.49 (1.20 to 1.86)	78	1.42 (1.06 to 1.90)	75	1.36 (1.01 to 1.83)
>20 – 40	210,291	122	1.75 (1.39 to 2.22)	119	1.70 (1.34 to 2.16)	74	1.76 (1.29 to 2.40)	73	1.70 (1.24 to 2.32)
>40	44,070	20	1.30 (0.80 to 2.10)	20	1.28 (0.79 to 2.08)	12	1.27 (0.67 to 2.39)	12	1.23 (0.65 to 2.32)
<i>P</i> -trend [§]			<0.001		<0.001		0.001		0.003
Continuous per 10 cigarettes			1.14 (1.08 to 1.20)		1.13 (1.07 to 1.20)		1.12 (1.04 to 1.20)		1.11 (1.03 to 1.20)

Alcohol consumption

Alcoholic Drinks/Day

0	543,371	242	Reference	235	Reference	112	Reference	109	Reference
>0 – 0.5	738,752	224	0.86 (0.70 to 1.04)	214	0.87 (0.71 to 1.06)	161	1.14 (0.89 to 1.48)	151	1.13 (0.87 to 1.47)
>0.5 – <1	230,357	90	1.02 (0.79 to 1.32)	88	1.06 (0.82 to 1.38)	46	0.95 (0.66 to 1.37)	45	0.98 (0.68 to 1.42)

1 – <3	305,055	128	0.92 (0.73 to 1.16)	127	0.95 (0.75 to 1.21)	84	1.19 (0.87 to 1.61)	81	1.19 (0.87 to 1.63)
3 – <5	64,882	43	1.07 (0.76 to 1.51)	42	1.06 (0.75 to 1.21)	18	1.05 (0.62 to 1.76)	18	1.06 (0.63 to 1.79)
≥5	40,359	22	0.91 (0.58 to 1.42)	22	0.93 (0.59 to 1.46)	14	1.25 (0.70 to 2.21)	14	1.26 (0.71 to 2.24)
<i>P</i> -trend [§]			0.99		0.85		0.47		0.41
Continuous per 1 drink			1.01 (0.98 to 1.04)		1.01 (0.98 to 1.04)		0.98 (0.93 to 1.04)		0.98 (0.93 to 1.04)

*Adjusted for sex (male, female), race (white, black, Asian and Pacific Islander, other), education (<high school graduate, high school graduate, some college or post-high school training), body mass index in kg/m² (<18.5, 18.5-<25, 25-<30, ≥30), history of diabetes (ever vs never diagnosed), and birth cohort (1870-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1982). Smoking models were additionally adjusted for alcoholic drinks per day (0, >0-0.5, >0.5-1, 1-<3, ≥3). Alcohol models were additionally adjusted for smoking status (never, former, current). Models were also adjusted for self-reported gallstones (ever vs never diagnosed) where indicated. Restricted to the following 17 studies: Adventist Health Study-2 (AHS-2), Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study (ATBC), Cohort of Swedish Men (COSM), Cancer Prevention Study II Nutrition Cohort (CPS-II NC), European Prospective Investigation into Cancer and Nutrition (EPIC), Japan Public Health Center-based prospective Study 1 and 2 (JPHC), Melbourne Collaborative Cohort Study (MCCS), Multiethnic Cohort Study (MEC), Nurses' Health Study (NHS), National Institutes of Health-American Association of Retired Persons Diet and Health Study (NIH-AARP), New York University Women's Health Study (NYUWHS), Physicians' Health Study (PHS), Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial (PLCO), Sister Study (SISTER), Swedish Mammography Cohort (SMC), Women's Health Initiative (WHI), and Women's Health Study (WHS). HR=Hazard ratio; CI=Confidence interval.

[†]No of noncases: The noncase group represented here is for the standard adjustment models. Models additionally adjusted for gallstones had slightly fewer noncases, but the numbers were not materially altered.

[‡]No. of noncases and No. of cases: Some counts do not add to totals due to missing data.

[§]*P*-trend: Two-sided *P*-value for the ordinal variable, calculated using the Wald test.

Supplementary Table 9. Adjusted hazard ratios (HR) and 95% confidence intervals (CI) for associations of cigarette smoking and alcohol consumption with gallbladder cancer risk in the Biliary Tract Cancers Pooling Project – estimates from the pooled dataset, restricted to 9 studies with information on cholecystectomy.*

Exposure	Overall [†]			No History of Cholecystectomy [‡]		
	No. of noncases [§]	No. of cases [§]	HR (95% CI)	No. of noncases [§]	No. of cases [§]	HR (95% CI)
Cigarette smoking						
Ever Smoking						
No	492,768	262	Reference	352,575	197	Reference
Yes	664,134	296	1.08 (0.91 to 1.28)	426,291	200	1.10 (0.89 to 1.35)
Smoking Status						
Never smoker	492,768	262	Reference	352,575	197	Reference
Former smoker	513,711	234	1.07 (0.89 to 1.29)	327,136	152	1.06 (0.85 to 1.32)
Current smoker	149,226	62	1.12 (0.84 to 1.49)	98,247	48	1.25 (0.90 to 1.74)
Smoking Pack-years						
Never smoker	492,768	262	Reference	352,575	197	Reference
>0 – 20	246,869	107	0.89 (0.71 to 1.12)	209,886	100	1.00 (0.78 to 1.28)
>20 – 40	134,554	59	1.06 (0.79 to 1.41)	108,615	53	1.25 (0.92 to 1.72)
>40	103,824	49	1.22 (0.89 to 1.68)	80,988	38	1.32 (0.92 to 1.91)
<i>P</i> -trend			0.35			0.08
Continuous per 10 pack-years			1.03 (0.99 to 1.08)			1.05 (1.00 to 1.11)
Smoking Duration (years)						
Never smoker	492,768	262	Reference	352,575	197	Reference
>0 – 10	75,752	34	0.89 (0.62 to 1.28)	65,921	32	0.96 (0.65 to 1.40)
>10 – 20	88,185	32	0.79 (0.54 to 1.15)	75,747	30	0.87 (0.59 to 1.29)
>20 – 40	264,676	115	1.04 (0.83 to 1.31)	214,783	98	1.17 (0.91 to 1.51)
>40	69,598	38	1.21 (0.85 to 1.72)	54,450	33	1.42 (0.97 to 2.08)
<i>P</i> -trend			0.53			0.10
Continuous per 10 years			1.02 (0.97 to 1.09)			1.06 (0.99 to 1.13)
Smoking Intensity (cigarettes/day)						
Never smoker	492,768	262	Reference	352,575	197	Reference
>0 – 10	216,568	113	1.06 (0.84 to 1.32)	153,683	83	1.03 (0.79 to 1.34)
>10 – 20	218,247	92	1.06 (0.83 to 1.35)	140,672	62	1.11 (0.82 to 1.49)
>20 – 40	172,004	68	1.12 (0.85 to 1.48)	98,460	42	1.24 (0.87 to 1.76)
>40	38,562	14	1.09 (0.63 to 1.89)	17,558	6	1.14 (0.50 to 2.60)
<i>P</i> -trend			0.42			0.24
Continuous per 10 cigarettes			1.03 (0.97 to 1.11)			1.06 (0.97 to 1.16)
Alcohol consumption						
Alcoholic Drinks/Day						
0	373,771	222	Reference	254,131	166	Reference
>0 – 0.5	450,467	218	0.98 (0.80 to 1.19)	298,306	150	0.96 (0.76 to 1.22)
>0.5 – <1	122,850	50	0.89 (0.65 to 1.23)	88,096	40	0.95 (0.66 to 1.36)
1 – <3	171,144	64	0.86 (0.64 to 1.15)	122,495	44	0.79 (0.55 to 1.13)
3 – <5	64,457	19	0.91 (0.52 to 1.62)	40,590	12	0.79 (0.55 to 1.13)

≥5	28,390	6	0.61 (0.27 to 1.38)	16,155	2	0.36 (0.09 to 1.47)
<i>P</i> -trend			0.16			0.15
Continuous per 1 drink			0.94 (0.87 to 1.01)			0.91 (0.81 to 1.01)

*Adjusted for sex (male, female), race (white, black, Asian and Pacific Islander, other), education (<high school graduate, high school graduate, some college or post-high school training), body mass index in kg/m² (<18.5, 18.5-<25, 25-<30, ≥30), history of diabetes (ever vs never diagnosed) and birth cohort (1870-1899, 1900-1909, 1910-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1982). Smoking models were additionally adjusted for alcoholic drinks per day (0, >0-0.5, >0.5-1, 1-<3, ≥3). Alcohol models were additionally adjusted for smoking status (never, former, current). Restricted to the following 9 studies: Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study (ATBC), Cancer Prevention Study II Nutrition Cohort (CPS-II NC), Health Professionals Follow-up Study (HPFS), Melbourne Collaborative Cohort Study (MCCS), Multiethnic Cohort Study (MEC), Nurses' Health Study (NHS), National Institutes of Health-American Association of Retired Persons Diet and Health Study (NIH-AARP), Sister Study (SISTER), and Women's Health Initiative (WHI). HR=Hazard ratio; CI=Confidence interval.

[†]Overall: Risk estimates for all participants in the 9 studies that provided information on history of cholecystectomy, regardless of cholecystectomy status.

[‡]No History of Cholecystectomy: Risk estimates restricted to participants without a history of cholecystectomy (self-reported).

[§]No. of noncases and No. of cases: Some counts do not add to totals due to missing data.

^{||}*P*-trend: Two-sided *P*-value for the ordinal variable, calculated using the Wald test.