Web appendices

NEWCASTLE-OTTAWA QUALITY ASSESSMENT SCALE

COHORT STUDIES

<u>Note</u>: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability.

Selection

1) <u>Representativeness of the exposed cohort</u>

    a) truly representative of the average current drinker in the community *****

    b) somewhat representative of the average current drinker in the community *****

    c) selected group of users, e.g. nurses, volunteers

    d) no description of the derivation of the cohort

2) <u>Selection of the non-exposed cohort</u>

    a) drawn from the same community as the exposed cohort *****

    b) drawn from a different source

    c) no description of the derivation of the non-exposed cohort

3) <u>Ascertainment of exposure</u>

    a) secure record, e.g. surgical records *****

    b) structured interview *****

    c) written self-report, e.g. postal questionnaire

    d) no description

4) <u>Demonstration that outcome of interest was not present at start of study</u>

    a) yes *****

    b) no

Comparability

1) <u>Comparability of cohorts on the basis of the design or analysis</u>

    a) study controls for a measure of adiposity *****

b) study controls for any additional factor *****

Outcome

1) <u>Assessment of outcome</u>

    a) independent blind assessment or objective ascertainment *****

    b) record linkage *****

    c) self report

    d) no description

2) <u>Was follow-up long enough for outcomes to occur</u>

    a) yes, at least six years duration *****

    b) no

3) <u>Adequacy of follow up of cohorts</u>

    a) complete follow up: all subjects accounted for *****

    b) subjects lost to follow up unlikely to introduce bias: >5% lost, or description of those lost ▯

    c) follow up rate <95% and no description of those lost

    d) no statement

Supplemental Table S2 Characteristics of selected studies

First author	Year	Country	Dataset	Study design	Population	Baseline age (years)	Follow-up (years)[a]	Study size (n)	Exposure ascertainment	Case ascertainment
Holbrook[1]	1990	United States	Rancho Bernardo Study	Cohort	Community	40-79	14	Men: 221 Women: 303	Alcohol intake was based on reported average weekly consumption of all alcoholic drinks obtained by a trained interviewer.	A fasting plasma glucose (FPG) level of >140 mg/dl or a 2-hour post challenge glucose reading of >200 mg/dl, or a self-reported history of diabetes diagnosed by a physician.
Kawakami[2]	1997	Japan	Large electrical company	Cohort	Occupational	18-53	7.9	2,312	Men were asked whether they regularly drank any alcoholic beverages. Drinkers were asked to recall mean amounts of alcoholic beverages usually consumed per week during the past year. The amount of ethanol consumed per week was then estimated by multiplying the amount of each beverage by its ethanol concentration and adding data for all beverages together.	All participants received a 'semi-quantitative test for glucose in a urine sample'. Fasting plasma glucose was measured for men found to have glycosuria. Those with a FPG level ≥110 mg/dl were subject to a 75-g oral glucose tolerance test (OGTT) with T2DM diagnosis made according to World Health Organization criteria of the time.
Tsumura[3]	1999	Japan	Osaka Health Survey	Cohort	Occupational	35-61	9.7	6,362	Questions concerned the type of alcoholic beverages consumed, the weekly frequency of alcohol consumption, and the usual amount of alcohol consumed daily.	A FPG level of ≥140mg/dl (7.8mmol/l) or OGTT of ≥200mg/dl (11.1mmol/l). An OGTT could not be administered to all participants. For these participants, T2DM was defined according to a FPG level of ≥126mg/dl (7.0mmol/l) as per American Diabetes Association (ADA) criteria.
Ajani[4]	2000	United States	Physicians' Health Study	Cohort	Occupational	40-85	12.1	20,951	Participants were asked "how often do you usually consume alcoholic beverages?" The response categories were: "rarely/never", "1-3 times/month", "1 times/week", "2-4 times/week", "5-6 times/week", "daily", "≥2 times/day". Responses were interpreted as the number of drinks consumed in the specified period.	Self-reports of T2DM diagnosis as disclosed via mailed questionnaires. Because participants were physicians, medical records were not requested to confirm self-reports.
Wei[5]	2000	United States	Cooper Clinic Study	Cohort	Community	30-79	6.1	8,633	Participants were asked "How many 12-ounce drinks of beer, 3-ounce drinks of wine (5-ounce drinks of wine in more recent data), and/or 1.5-ounce drinks of hard liquor do you consume per week?" The alcohol content was estimated as 1.1g for 1 ounce of beer, 2.7g for 1 ounce of wine, and 15.1g for 1 ounce of liquor.	FPG level of ≥126mg/dl (7.0mmol/l). Subjects who did not meet this criterion but who reported a history of diabetes and current therapy with insulin also were also defined as cases.
Conigrave[6]	2001	United States	Health Professionals' Follow-up Study	Cohort	Occupational	40-75	10.9	48,733	Beverage-specific consumption frequency was recorded using nine intake categories, ranging from "never" or "less than monthly" to "six or more times per day". To estimate beverage-specific alcohol consumption in average grams per day, consumption for each beverage type was multiplied by estimated ethanol content: 12.8g per can/bottle/glass of beer; 11.0g per glass of white or red wine; 14.0g per glass of liquor. Intake for each beverage was then summed to give total average grams of alcohol per day.	Before 1996, T2DM was diagnosed according to any one of the following criteria, provided the participant did not fulfil criteria for T1DM (i.e., two or more of the following: repeated ketonuria, not obese, onset at age ≥30 years): (1) one or more classic symptoms of diabetes with an elevated plasma glucose (i.e., FPG of ≥7.8mmol/l (140mg/dl), non-FPG of ≥11.1mmol/l (200mg/dl), or OGTT of ≥11.1mmol/l; (2) elevated plasma glucose levels on two different occasions; or (3) self-reported hypoglycaemic treatment. From 1996 onward, a lower FPG threshold was applied (≥7.0mmol/l, 126.0mg/dl).

Author	Year	Country	Study	Design	Setting	Age	%	N	Alcohol assessment	T2DM case definition
Hu[7]	2001	United States	Nurses' Health Study	Cohort	Occupational	30-55	15.3	84,093	As part of a semi-quantitative food frequency questionnaire, interviewers asked how often, on average, a participant had consumed a particular amount of a specific type of food during the previous year. The intake of nutrients was computed by multiplying the frequency of consumption of each unit of food by its nutrient content. Questions about the consumption of beer, wine, and liquor were included in each questionnaire.	After a self-report of T2DM, cases were considered confirmed if at least one of the following criteria was reported on a supplementary questionnaire: classic symptoms plus FPG of ≥140mg/dl (7.8mmol/l) or a randomly measured plasma glucose concentration of ≥200mg/dl (11.1mmol/l); at least two elevated plasma glucose concentrations on different occasions (FPG of ≥140mg/dl, or a randomly measured concentration of ≥200mg/dl, or ≥200mg/dl following OGTT) in the absence of symptoms; or treatment with hypoglycaemic medication.
Kao[8]	2001	United States	ARIC Study	Cohort	Community	45-64	Men: 5.3 Women: 5.4	Men: 5,423 Women: 6,839	Two questions were used to determine the current drinking status of participants: "Do you presently drink alcoholic beverages?" and "Have you ever consumed alcoholic beverages?" Participants were classified as lifetime abstainers if they answered "no" to both questions. Those who answered "no" to the first question and "yes" to the second question were classified as former drinkers. Participants who answered "yes" to both questions were considered current drinkers. Current drinkers were then asked about the amount of drinks consumed per week. Researchers assumed one generic drink to be equal to 12.0g of ethanol.	Cases defined by the presence of any one of the following: (1) FPG of ≥7.0mmol/l, (2) non-FPG of ≥11.1mmol/l, (3) diabetic medication, or (4) a positive response to the question, "Has a doctor ever told you that you had diabetes (sugar in the blood)?"
Meisinger[9]	2002	Germany	MONICA Study	Cohort	Community	35-74	Men: 7.5 Women: 7.6	Men: 3,052 Women: 3,114	As part of a standardised face-to-face interview, each participant was asked how much beer, wine and spirits he or she had consumed on the previous workday and during the previous weekend.	Self-report of T2DM diagnosis or the reported use of anti-diabetic medication.
Wannamethee[10]	2002	United Kingdom	British Regional Heart Study	Cohort	Community	40-59	16.8	5,221	Alcohol consumption was recorded at initial screening using questions on frequency, quantity, and type.	Self-reported T2DM, confirmed via primary care records.
Carlsson[11]	2003	Finland	Finnish Twin Cohort	Cohort	Community	≥18	28	Men: 9,816 Women: 11,803	Using seven-point scales, questions were asked concerning the quantity of beer, wine, and spirits consumed during an average week (beer, wine) or month (spirits). Reported consumption of each drink type was converted into grams of ethanol and summed to estimate total alcohol consumption in grams per day. The midpoint of each response category was used for calculations except for the highest consumption category for which we used the lower limit in the calculations to obtain a conservative estimate. Lifetime abstainers were defined as non-drinkers at baseline (1975) who reported that their alcohol consumption had not been greater at any time prior.	T2DM information for 1976-1996 was collected from death certificates, the National Hospital Discharge Register and the Medication Register of the Social Insurance Institution. Diabetes information for 1996-2004 was collected solely from the Medication Register and individuals were presumed cases according to their age.
Lee[12]	2003	Korea	Korean steel company	Cohort	Occupational	25-55	4	4,055	Self-administered questionnaire. No further detail published.	Cases were defined according to the updated ADA criteria (FPG of ≥126 mg/dl or taking diabetes medication). Cases were assumed to be T2DM given the age of onset within the cohort.
Nakanishi[13]	2003	Japan	Japanese building contractor	Cohort	Occupational	35-59	6.1	2,953	Questions concerning alcohol intake included items regarding the frequency of alcohol consumption per week, type of alcoholic beverage, and usual amount consumed daily in units of "go" (a Japanese unit of measurement, corresponding to 23 g ethanol). Weekly alcohol intake was calculated and then converted to daily alcohol consumption. One go was considered equal to 180ml sake, one bottle (663ml) of beer, two shots (75ml) of whiskey, or two glasses (180ml) of wine.	Cases were defined according to the ADA criteria: FPG of ≥7.0mmol/l or receipt of hypoglycaemic medications.

Author	Year	Country	Study	Design	Setting	Age	%	N	Alcohol assessment	Diabetes ascertainment
Sawada[14]	2003	Japan	Tokyo gas company	Cohort	Occupational	20-40	13.6	4,745	Self-administered questionnaire. No further detail published.	Cases were defined according to any one of the following three diagnostic parameters: OGTT of >11.1mmol/l (200mg/dl), conducted in men with urinary glucose detected at a follow-up annual health examination; self-reported prescription of hypoglycaemic medication; FPG according to ADA criteria (FPG of ≥7.0mmol/l).
Wannamethee[15]	2003	United States	Nurses' Health Study II	Cohort	Occupational	25-42	8.1	104,885	Questions were asked about the beverage-specific frequency of consumption (beer, wine and liquor) during the past year, according to nine categories. Intake in g/day was then calculated assuming the following ethanol contents: 12.8g per 360ml can of beer; 11.0g per 120ml glass of wine; 14.0g per standard drink of liquor. Participants were also asked about their consumption when aged 15-17, 18-22, 23-30, and 31-40 years. Baseline non-drinkers who reported drinking during any of these periods were classified as ex-drinkers, and lifetime abstainers as those who reported abstention at all intervals.	Before 1996, T2DM was diagnosed according to any one of the following criteria, provided the participant did not fulfil criteria for T1DM (i.e., two or more of the following: repeated ketonuria, not obese, onset at age ≥30 years): (1) one or more classic symptoms of diabetes with an elevated plasma glucose (i.e., FPG of ≥7.8mmol/l (140mg/dl), non-FPG of ≥11.1mmol/l (200mg/dl), or OGTT of ≥11.1mmol/l; (2) elevated plasma glucose levels on two different occasions; or (3) self-reported hypoglycaemic treatment. From 1996 onward, a lower FPG threshold was applied (≥7.0mmol/l, 126 mg/dl).
Lee[16]	2004	United States	Iowa Women's Health Study	Cohort	Community	55-69	9.3	35,698	Self-administered questionnaire. No further detail published.	T2DM was defined according to an affirmative response to the following follow-up survey question: "since baseline (or last follow-up), were you diagnosed for the first time by a doctor as having sugar diabetes?"'
Waki[17]	2005	Japan	JPHC Study	Cohort	Community	40-59	10	Men: 12,913 Women: 15,980	Questions on alcohol intake included items about the types of alcoholic beverages consumed, the frequency of alcohol consumption per week, and the usual amount of alcohol consumed per day. Total daily intake was calculated by multiplying the frequency of consumption by the assumed ethanol content of each beverage: 23.0g per 180ml of sake; 36.0g per 180ml shochu or awamori (distilled liquors); 10.0g per 30ml whisky or brandy; 6.0g per 60ml wine; 23.0g per 633ml beer. Lifetime abstainers were defined as non-drinkers and infrequent occasional drinkers who consumed alcohol on ≤3 days per month.	Cases of T2DM were self-reported via questionnaires and an affirmative response to the question "has a doctor ever told you that you have diabetes?" All cases were classified as T2DM given the age of onset within the cohort.
Hodge[18]	2006	Australia	Melbourne Collaborative Cohort Study	Cohort	Community	40-69	4	Men: 12,214 Women: 19,208	Non-lifetime abstainers reported their current average frequency and quantity of consumption of specific alcoholic beverages, and their consumption on each day during the previous week via a seven-day diary. Lifetime abstainers defined as never and consistently light drinkers – i.e. those who had never drunk at least 12 alcoholic drinks in any year.	Self-reported diagnosis, confirmed by physician verification.
Hu[19]	2006	Finland	FINMONICA	Cohort	Community	35-74	Men: 13.0 Women: 13.8	Men: 10,118 Women: 11,197	Self-administered questionnaire. No further detail published.	Cases were identified via the National Hospital Discharge Register and the National Social Insurance Institution's Drug Register, confirmed according to World Health Organization criteria: one or more classic symptoms plus FPG of ≥7.8mmol/l (≥7.0mmol/l from 1998) or an OGTT of ≥11.1mmol/l; at least 1 raised plasma glucose concentration with a FPG of ≥7.8mmol/l (≥7.0mmol/l from 1998) or an OGTT of 11.1mmol/l in the absence of symptoms; or treatment with a hypoglycaemic drug.

Author	Year	Country	Study	Design	Setting	Age	Follow-up	Sample size	Exposure assessment	Case definition
Strodl[20]	2006	Australia	Australian Women's Health Survey	Cohort	Community	70-74	3	8,582	Self-administered questionnaire. No further detail published.	Cases were defined according to self-reported diagnosis via survey. No distinction was made between T1DM and T2DM.
Burke[21]	2007	Australia	Kimberley Aborigines	Cohort	Community	15-88	12.9	Men: 229 Women: 225	Questionnaires were administered by interviewers experienced in communicating with Aboriginal people. Alcohol intake, based on a contextualised diary of the last two 48h drinking periods, was converted to g/day of alcohol.	Participants were linked to records of death and hospital admission.
Djoussé[22]	2007	United States	Cardiovascular Health Study	Cohort	Community	63-95	6.3	Men: 1,899 Women: 2,756	Participant were asked to report their usual frequency of beer, wine and liquor consumption, as well as the usual number of 12-ounce cans/bottles of beer, 6-ounce glasses of wine, and shots of liquor consumed on each occasion. Participants reported whether they had (a) changed consumption behaviour during the preceding 5 years and (b) ever regularly consumed ≥5 or more drinks per day. Those who reported abstention at baseline but reported (a) any alcohol consumption during the previous 5 years or (b) ever regularly consuming ≥5 or more drinks per day were classified as former drinkers. Never drinkers thus comprised baseline abstainers who had not changed consumption during the preceding five years and never regularly consumed ≥5 drinks/day.	Cases were identified if participants reported the use of insulin or oral hypoglycaemic agents, or had a FPG of ≥7.0mmol/l (≥126mg/dl).
Maty[23]	2008	United States	Alameda County Study	Cohort	Community	17-94	34	Men: 2,756 Women: 3,157	Alcohol consumption was estimated following questions concerning beverage type (beer, wine, or liquor), frequency (never, <1 time per week, 1–2 times per week, >2 times per week), and quantity at each sitting (none, 1–2 drinks, 3–4 drinks, ≥5 drinks).	Self-reported diabetes status was assessed at each study wave using two questions: "have you had any of these conditions [e.g., diabetes] during the past 12 months (yes/no)" and "when did it start (year)?"'
Onat[24]	2009	Turkey	Turkish Adult Risk Factor Study	Cohort	Community	≥18	7.4	Men: 1,603 Women: 1,610	Self-administered questionnaire. No further detail published.	Cases were determined according to the ADA criteria: FPG ≥126 mg/dl (or OGTT >200mg/dl) and/or the current use of diabetes medication.
Roh[25]	2009	Korea	Annual health evaluation	Cohort	Community	Not reported	4	1,717	Exposure was assessed by frequency (none, 2-3 times per month, 1-2 times per week, 3-4 times per week, or everyday) and quantity of intake when drinking. Questions were asked in reference to Soju, a popular Korean alcoholic beverage estimated to contain 65.0g ethanol per bottle. Total alcohol intake was calculated by multiplying frequency by quantity.	T2DM was determined when FPG ≥126 mg/dl at follow-up and <100mg/dl at baseline.
Boggs[26]	2010	United States	Black Women's Health Study	Cohort	Community	21-69	9.4	46,401	As part of a self-administered food-frequency questionnaire, participants were asked if they ever drank alcoholic beverages "at least once a week for at least a year," with response categories of "yes, I drink currently," "yes, but I no longer drink," and "no." Current drinkers were asked to report their average frequency of beer, wine, and liquor consumption during the previous year according to five categories ranging from <1 drink to >21 drinks per week. Total alcohol intake was calculated by summing responses. Researchers assumed each drink was equivalent to 12.0g alcohol.	Incident cases of T2DM were ascertained through self-report on biennial follow-up questionnaires. Participants who reported a diagnosis of diabetes before the age 30 years were excluded to limit the probability of including T1DM cases.
Jee[27]	2010	Korea	Korean Cancer Prevention Study	Cohort	Community	30-95	14	Men: 787,764 Women: 448,660	Self-administered questionnaire. No further detail published.	Outpatient treatment for diabetes (at least three visits for diabetes care per 365 days).
Nagaya[28]	2010	Japan	Gifu Prefectural Center for Health Check and Health Promotion	Cohort	Community	30-59	Men:8.2 Women: 7.7	Men: 16,828 Women: 8,368	Self-administered questionnaire partially supported and reconfirmed by a personal interview with a public health nurse. No further detail published.	T2DM defined according to FPG ≥7.00mmol/l (126mg/dl) and/or a self-report of diabetic medication usage.

Study	Year	Country	Study name	Study design	Setting	Age	Follow-up (years)	Participants	Alcohol assessment	Case definition
Balkau[29]	2011	France	DESIR	Cohort	Community	30-65	9	Men: 1,876 Women: 1,797	Alcohol consumption was estimated from a self-administered questionnaire which asked the usual daily intake of wine, beer, cider and spirits. Spirits were reported in glasses per week, and all remaining drink types according to six pre-defined categories: non-drinker, <0.5, 0.5-1, 1-2, 2-3, or >3 litres per day. The following strengths were assumed: 10.0g ethanol per 125ml wine or 250ml of beer/cider; 7.0g ethanol per glass of spirits (20ml).	Cases defined as FPG ≥7.0mmol/l and/or HbA1c ≥6.5% and/or treatment.
Beulens[30]	2012	Denmark, France, Germany, Italy, Netherlands, Spain, Sweden, United Kingdom	EPIC–InterAct study	Nested case–cohort	Community	35-70	9.9	Men: 11,535 Women: 15,282	Via a food frequency questionnaire, participants reported the frequency and number of glasses of beer, cider, wine, sweet liquor, distilled spirits or fortified wines consumed during the 12 months prior to recruitment. Country-specific intake was calculated based on estimated average glass volume and ethanol content for each type of alcoholic beverage.	Incident T2DM was ascertained using from multiple sources: self-reported diabetes from follow-up questionnaires (self-reported history of diabetes, physician-diagnosed diabetes and anti-diabetic drug use), linkage to primary or secondary care registers, medication use (drug registers), or hospital admission and mortality data. Cases in Denmark and Sweden were not ascertained by self-report, but identified via local and national diabetes and pharmaceutical registers. In Denmark and Sweden, for all cases with information from <2 independent sources, individual medical records were examined in some centres.
Cullmann[31]	2012	Sweden	Stockholm Diabetes Prevention Program	Cohort	Community	35-56	8-10	Men: 2,217 Women: 3,176	Participants completed a questionnaire enquiring into the frequency and quantity of medium and strong beer, wine, dessert wine and spirits. Each item was then converted into pure alcohol assuming the following ethanol concentrations per ml of drink: 0.035ml for medium-strong beer; 0.055ml for strong-beer; 0.12ml for wine; 0.19ml for dessert wine and 0.4ml for spirits. These figures were them converted into grams per day by the conversion factor 0.789g/ml.	Cases were defined according to an FPG reading of ≥7.0mmol/l and/or 2-h post-load OGTT of ≥11.1mmol/l.
Sato[32]	2012	Japan	Kansai Healthcare Study	Cohort	Occupational	40-55	3.5	10,631	A self-administered questionnaire included questions about the weekly frequency of alcohol consumption and the quantity consumed per drinking day according to a Japanese standard drink equivalent to 23.0g ethanol per 180ml of Japanese sake. Average daily consumption was calculated as ((the quantity consumed per drinking day)*(the weekly frequency of alcohol consumption)/7).	T2DM was diagnosed if a FPG was ≥7.0mmol/l or if participants were taking hypoglycaemic medications or insulin. All cases were diagnosed after the age of 40 years thus classified as T2DM.
Stringhini[33]	2012	United Kingdom	Whitehall II	Cohort	Occupational	35-55	14.2	8,423	Alcohol consumption was assessed using questions concerning the number of alcoholic drinks consumed in the previous week, then converted to number of alcohol units consumed per week. No further detail published.	Diabetes was defined by WHO criteria based on FPG of ≥7.0mmol/l or 2-hour post-load OGTT of ≥11.1mmol/l. Participants reporting doctor-diagnosed diabetes or the use of anti-diabetic drugs were classified as having diabetes regardless of test results.
Teratani[34]	2012	Japan	Japanese steel company	Cohort	Occupational	Not reported	4.4	Men: 5,041 Women: 2,196	Beverage-specific quantities of alcohol consumption were calculated according to data reported via self-administered questionnaires. The following ethanol concentrations were assumed: 22.0g per 180ml of Japanese sake, 500ml of beer, 60ml of whiskey, 180ml of wine, or 110ml of shochu (white spirits).	Diagnosis of diabetes mellitus was based on two data sources: results of the annual health examination (HbAlc ≥6.1% or taking anti-diabetic medication) and individual medical histories (self-completion questionnaire, with response confirmed during interviews conducted by occupational physicians).

Abbasi[35]	2013	Netherlands	PREVEND	Cohort	Community	28-75	8	Men: 3,247 Women: 3,573	Self-administered questionnaire. No further detail published.	T2DM was ascertained if one or more of the following criteria were met: (1) FPG of ≥7.0mmol/l (126 mg/dl); (2) random plasma glucose ≥11.1mmol/L (200 mg/dl); (3) self-report of a physician diagnosis; and (4) use of glucose-lowering medication as retrieved from a central pharmacy registry.
Heianza[36]	2013	Japan	TOPICS 11	Cohort	Community	26-80	10.2	1,610	Alcohol consumption was determined using a questionnaire at the baseline examination. The participants were asked about their current drinking status (non-drinkers, past drinkers, or current drinkers) and the patterning of consumption. Lifetime abstainers were defined as those who had never consumed alcohol, and former drinkers as those who had ever consumed alcohol but currently did not. We calculated the average alcohol consumption was ascertained by multiplying the usual quantity of alcohol consumed per occasion by the frequency of alcohol consumption.	Diagnosis of T2DM was made according to three criteria: a FPG of ≥7.0mmol/l, self-reported doctor-diagnosed diabetes, or HbA1c ≥6.5%.
Rasouli[37]	2013	Norway	Nord-Trøndelag Health Survey	Cohort	Community	≥20	11	Men: 19,403 Women: 22,282	Total daily amount of alcohol consumption and also type of alcoholic drinks were derived from the answers to the following question: 'How many drinks of beer, wine or spirits do you usually drink in the course of 2 weeks?' To compute total grams of alcohol per day for each type of beverage, the reported consumed amount was multiplied by alcohol content of the specified beverage (16g for one can/bottle/glass of beer, 12g for one glass of wine and 12g for one standard drink of spirits) and the numbers summed.	T1DM was tested for using a marker of autoimmune damage to pancreatic beta-cells (glutamic acid decarboxylase, anti-GAD). Those who were anti-GAD negative (<0.08, antibody index) were classified as having T2DM.
Shi[38]	2013	China	Shanghai Men's Health Study	Cohort	Community	40-74	5.4	50,090	In-person interviews were conducted by trained interviewers. Participants who reported alcohol consumption at least once per week for more than 6 months were defined as current drinkers and asked about the types, frequencies, and usual quantity of alcohol consumed (rice wine, grape wine, beer, and liquor). One unit was defined as a 4-ounce glass of wine, 12-ounce can of beer, or one ounce of liquor. Total alcohol consumption was calculated by summing units of intake for all beverage types. Former drinkers were excluded from the analysis. Non-drinkers were therefore defined as participants who reported never having consumed alcohol on a regular basis (at least once per week) for more than 6 months.	Participants were asked if they had been diagnosed with diabetes by a physician. Those who reported having T2DM were also asked about their blood glucose levels. Cases of T2DM were confirmed if the participant's reported glucose level met at least one of the ADA's recommended criteria: (1) FPG of ≥7mmol/l on at least two separate occasions, (2) an OGTT ≥11.1mmol/l, or (3) use of hypoglycaemic medication.

[a] Where data were available, average follow-up was calculated as [person-years/reported sample size]. Otherwise listed as the maximum duration of the study.

Supplemental Table S3 Measures of alcohol consumption, confounder adjustment and effect estimates reported by selected studies

First author	Sex	Alcohol consumption		Risk of T2DM				Confounder adjustment	Quality assessment score
		Reported exposure categories[a]	Estimated g/day[b]	Cases (n)	Non-cases (n)	Measure of association	Effect estimates		
Holbrook[1]	Men	Non-drinkers	Non-drinkers	6	31	Relative risk	1.00 (reference)	Age	7
		0.1-84.3g/week	6.0	7	53		0.72 (95% CI 0.26-1.98)		
		84.4-176.0g/week	18.6	6	55		0.61 (95% CI 0.21-1.74)		
		176.1-750g/week	66.2	16	47		1.57 (95% CI 0.67-3.65)		
	Women	Non-drinkers	Non-drinkers	16	68		1.00 (reference)		
		0.1-41.3g/week	6.0	7	67		0.50 (95% CI 0.22-1.14)		
		41.4-117.4g/week	18.6	12	60		0.88 (95% CI 0.44-1.73)		
		117.5-750g/week	66.2	12	61		0.86 (95% CI 0.44-1.70)		
Kawakami[2]	Men	0ml/week	0.0	11[c]	590[c]	Hazard ratio	1.00 (reference)	Age; BMI; education status; family history of diabetes mellitus; occupation; physical activity; smoking status; work shift pattern	7
		<300ml/week	16.9	23[c]	1,595[c]		1.04 (95% CI 0.47-2.32)		
		≥300ml/week	40.6	12[c]	533[c]		1.09 (95% CI 0.44-2.67)		
Tsumura[3]	Men	Non-drinkers	Non-drinkers	76	1,058	Relative risk	1.00 (reference)	Age	6
		0.1-19.0ml/day	7.5	95	1,226		0.98 (95% CI 0.73-1.33)		
		19.1-29.0ml/day	19.0	120	1,386		1.08 (95% CI 0.81-1.44)		
		29.1-50.0ml/day	31.2	60	1,057		0.80 (95% CI 0.57-1.12)		
		≥50.1ml/day	47.4	105	1,179		1.40 (95% CI 1.04-1.88)		
Ajani[4] Error! Bookmark not defined.	Men	Rarely/Never drinkers	Rarely/Never drinkers	145	2,900	Relative risk	1.00 (reference)	Age; BMI; physical activity; smoking status; treatment assignment group	6
		1-3 drinks/month	0.9	111	2,189		1.03 (95% CI 0.80-1.33)		
		1 drinks/week	2.0	122	2,806		0.89 (95% CI 0.70-1.14)		
		2-4 drinks/week	6.0	157	4,614		0.74 (95% CI 0.59-0.93)		
		5-6 drinks/week	11.0	80	2,613		0.67 (95% CI 0.51-0.88)		
		≥1 drink/day	16.8	151	5,063		0.57 (95% CI 0.45-0.73)		
Wei[5]	Men	Non-drinkers	Non-drinkers	36	1,811	Relative risk[d,e]	1.00 (reference)	Age; family history of diabetes; years of follow-up	6
		1-61.8g/week	4.8	21	1,675		0.78 (95% CI 0.44-1.37)		
		61.9-122.7g/week	13.1	16	1,682		0.56 (95% CI 0.31-1.00)		
		122.8-276.6g/week	26.6	35	1,655		1.22 (95% CI 0.75-1.98)		
		≥276.6g/week	83.5	41	1,661		1.32 (95% CI 0.83-2.11)		

Study	Sex	Category	Value	Cases	Total	Measure	Relative risk	Adjustments	Score
Conigrave[6]	Men	0g/day	0.0	416	10,656	Relative risk	1.00 (reference)	Age; BMI	5
		0.1-4.9g/day	2.3	450	11,356		1.09 (95% CI 0.95–1.24)		
		5.0-9.9g/day	7.3	214	6,941		0.88 (95% CI 0.74–1.04)		
		10.0-14.9g/day	12.3	163	6,050		0.77 (95% CI 0.64–0.92)		
		15.0-29.9g/day	19.7	174	6,321		0.80 (95% CI 0.67–0.96)		
		30.0-49.9g/day	38.1	116	4,419		0.72 (95% CI 0.58–0.88)		
		≥50.0g/day	70.1	38	1,419		0.64 (95% CI 0.46–0.89)		
Hu[7]	Women	0g/day	0.0	1,715	27,165	Relative risk	1.00 (reference)	Age; family history of DM; menopausal status; time; use of postmenopausal hormone therapy	6
		0.1-5g/day	2.6	1,034	26,997		0.78 (95% CI 0.72–0.84)		
		5.1-10.0g/day	7.6	189	9,155		0.56 (95% CI 0.48–0.65)		
		>10g/day	12.0	358	17,480		0.59 (95% CI 0.52–0.66)		
Kao[8]	Men	Lifetime abstainers	Lifetime abstainers	69	600	Relative risk[d,e]	1.00 (reference)	Age; BMI; education; ethnicity; family history of DM; history of hypertension; physical activity; smoking status; total energy intake; waist-hip ratio	7
		Former drinkers	Former drinkers				0.93 (95% CI 0.70-1.24)		
		≤1 drink/week	0.1	74	741		0.88 (95% CI 0.64-1.23)		
		1.1-7 drinks/week	6.1	139	1,227		0.98 (95% CI 0.74-1.30)		
		7.1-14 drinks/week	17.7	55	670		0.72 (95% CI 0.50-1.02)		
		14.1-21 drinks/week	29.3	32	281		0.94 (95% CI 0.62-1.41)		
		>21 drinks/week	57.4	60	379		1.75 (95% CI 1.26-2.44)		
	Women	Lifetime abstainers	Lifetime abstainers	236	1,987		1.00 (reference)		
		Former drinkers	Former drinkers				1.00 (95% CI 0.75-1.34)		
		≤1 drink/week	0.1	110	1,626		0.92 (95% CI 0.72-1.17)		
		1.1-7 drinks/week	5.7	90	1,226		0.99 (95% CI 0.74-1.33)		
		7.1-14 drinks/week	16.7	18	378		0.75 (95% CI 0.45-1.25)		
		14.1-21 drinks/week	28.9	5	125		0.60 (95% CI 0.24-1.47)		
		>21 drinks/week	49.6	2	56		0.39 (95% CI 0.10-1.55)		
Meisinger[9]	Men	0g/day	0.0	23	439	Relative risk	1.00 (reference)	None	6
		0.1-39.9g/day	20.0	46	1,518		0.59 (95% CI 0.36-0.96)		
		≥40g/day	48.0	58	968		1.14 (95% CI 0.71-1.82)		
	Women	0g/day	0.0	48	1,212		1.00 (reference)		
		0.1-19.9g/day	10.0	26	1,199		0.56 (95% CI 0.35-0.89)		
		≥20g/day	24.0	12	618		0.50 (95% CI 0.27-0.93)		

Study	Sex	Category	Value	Cases	n	Measure	Risk estimate (95% CI)	Adjustments	Score
Wannamethee[10]	Men	Non-drinkers	Non-drinkers	4	285	Relative risk[e]	1.00 (reference)	Age; BMI; history of CHD; physical activity; smoking status; social class	9
		<1 unit/week	0.6	62	1,150		0.91 (95% CI 0.50-1.65)		
		1-15 units/week	7.9	99	1,612		0.74 (95% CI 0.45-1.20)		
		15-42 units/week	32.7	64	1,361		0.60 (95% CI 0.36-0.99)		
		>42 units/week	63.2	18	566		0.87 (95% CI 0.50-1.51)		
Carlsson[11,f]	Men	Lifetime abstainers	Lifetime abstainers	64	1,045		1.00 (reference)	Age; BMI; smoking status	8
		Former drinkers	Former drinkers				0.91 (95% CI 0.46-1.80)		
		<5g/day	3.1	181	2,525		1.06 (95% CI 0.78-1.42)		
		5–30g/day	10.7	261	4,480		0.86 (95% CI 0.63-1.16)		
		>30g/day	42.8	75	1,023	Hazard ratio	0.90 (95% CI 0.61-1.32)		
	Women	Lifetime abstainers	Lifetime abstainers	280	2,977		1.00 (reference)		
		Former drinkers	Former drinkers				0.93 (95% CI 0.23-3.73)		
		<5g/day	2.3	273	5,655		0.79 (95% CI 0.66-0.95)		
		5–20g/day	6.9	55	2,173		0.66 (95% CI 0.47-0.91)		
		>20g/day	25.9	10	303		0.79 (95% CI 0.40-1.55)		
Lee[12]	Men	Non-drinkers	Non-drinkers	23	816	Relative risk	1.00 (reference)	None	3
		≤90g/week	6.5	33	1,793		0.66 (95% CI 0.39-1.12)		
		91-180g/week	19.4	11	733		0.54 (95% CI 0.26-1.10)		
		181-360g/week	38.6	11	497		0.79 (95% CI 0.39-1.61)		
		>360g/week	61.7	5	133		1.32 (95% CI 0.51-3.42)		
Nakanishi[13]	Men	0g/day	0.0	63	358		1.00 (reference)	Age; BMI; family history of diabetes; physical activity; smoking status	7
		0.1-22.9g/day	11.5	67	467		0.87 (95% CI 0.60-1.26)		
		23.0-45.9g/day	34.5	66	632	Relative risk[e]	0.66 (95% CI 0.47-0.93)		
		46.0-68.9g/day	57.5	107	774		0.78 (95% CI 0.56-1.10)		
		≥69g/day	82.8	67	352		0.95 (95% CI 0.65-1.38)		
Sawada[14]	Men	Non-drinkers	Non-drinkers	50	1,412	Relative risk	1.00 (reference)	Age; BMI; cardiorespiratory fitness; family history of T2DM; high blood pressure; smoking status	7
		1-45g/day	23.5	206	2,814		1.59 (95% CI 1.16-2.17)		
		≥46g/day	55.2	24	239		1.68 (95% CI 1.03-2.76)		

Study	Sex	Category	Intake (g/day)	Cases	Total	Measure	Risk estimate	Adjustments	Score
Wannamethee[15]	Women	Lifelong abstainers	Lifelong abstainers	181	14,736	Relative risk	1.00 (reference)	Age	4
		Former drinkers	Former drinkers				1.18 (95% CI 0.98-1.41)		
		0.1-4.9g/day	2.5	336	44,048		0.67 (95% CI 0.56-0.80)		
		5.0-14.9g/day	10.0	70	18,309		0.34 (95% CI 0.25-0.44)		
		15.0-29.9g/day	22.5	8	2,308		0.29 (95% CI 0.15-0.60)		
		≥30g/day	36.0	6	758		0.63 (95% CI 0.28-1.42)		
Lee[16]	Women	Non-drinkers	Non-drinkers	1,168	15,829	Rate ratio	1.00 (reference)	None	4
		1-14g/day	8.0	675	15,592		0.60 (95% CI 0.55-0.66)		
		≥15g/day	18.0	78	2,356		0.47 (95% CI 0.37-0.59)		
Waki[17]	Men	Non/infrequent drinkers	Non/infrequent drinkers	196	3,834	Relative risk[d]	1.00 (reference)	Age; BMI; family history of T2DM; hypertension; physical activity; smoking status	6
		≤23.0g/day	11.55	169	3,162		1.08 (95% CI 0.88-1.32)		
		23.1-46.0g/day	34.55	174	2,735		1.24 (95% CI 1.02-1.52)		
		>46.0g/day	55.32	164	2,479		1.23 (95% CI 1.00-1.52)		
	Women	Non/infrequent drinkers	Non/infrequent drinkers	436	13,919		1.00 (reference)		
		≤4.9g/day	2.5	15	465		1.14 (95% CI 0.69-1.90)		
		5.0-11.5g/day	8.25	16	636		0.81 (95% CI 0.49-1.34)		
		>11.5g/day	13.92	13	481		0.79 (95% CI 0.45-1.38)		
Hodge[18]	Men	Lifetime abstainer	Lifetime abstainer	25	1,795	Relative risk[d]	1.00 (reference)	Age; BMI; country of birth; dietary glycaemic index; dietary energy intake; waist-hip ratio	8
		Former drinkers	Former drinkers				2.44 (95% CI 1.29-4.52)		
		<10g/day	4.3	56	3,031		1.55 (95% CI 0.95-2.50)		
		10-19.9g/day	15.0	30	2,247		1.21 (95% CI 0.69-2.07)		
		20-29.9g/day	24.2	13	1,333		0.80 (95% CI 0.40-1.59)		
		≥30g/day	45.0	38	3,129		0.86 (95% CI 0.50-1.57)		
	Women	Lifetime abstainers	Lifetime abstainers	114	7,729		1.00 (reference)		
		Ex-drinkers	Ex-drinkers				1.12 (95% CI 0.55-2.24)		
		<10g/day	3.5	32	5,659		0.66 (95% CI 0.44-1.00)		
		10-19.9g/day	15.0	18	2,838		0.82 (95% CI 0.49-1.37)		
		≥20g/day	30.2	10	2,210		0.60 (95% CI 0.30-1.17)		

Study	Sex	Category	Dose	Cases	N	Measure	Estimate	Adjustments	Score
Hu[19]	Men	Non-drinkers	Non-drinkers	223	3,608	Hazard ratio	1.00 (reference)	Age; BMI; food consumption (bread; coffee, fruit, tea, sausage, vegetable); education status; physical activity; smoking status; study year; systolic blood pressure	8
		1-100g/week	7.2	190	3,661		0.91 (95% CI 0.75-1.11)		
		>100g/week	17.1	104	2,402		0.74 (95% CI 0.58-0.95)		
	Women	Non-drinkers	Non-drinkers	357	6,350		1.00 (reference)		
		1-100g/week	7.2	87	3,877		0.74 (95% CI 0.57-0.94)		
		>100g/week	17.1	3	523		0.23 (95% CI 0.07-0.73)		
Strodl[20]	Women	Non-drinkers	Non-drinkers	87	2,698	Relative risk[d]	1.00 (reference)	None	3
		Rarely drinkers	Rarely drinkers				1.00 (95% CI 0.74-1.35)		
		1-2 drinks/day	15.0	54	2,922		0.58 (95% CI 0.42-0.82)		
		≥3 drinks/day	36.0	12	306		1.21 (95% CI 0.67-2.17)		
Burke[21]	Men	Life-long abstainers	Life-long abstainers	7	14	Relative risk	1.00 (reference)	None	6
		Ex-drinkers	Ex-drinkers				0.78 (95% CI 0.37-1.65)		
		<150g/day	88.0	12	86		0.37 (95% CI 0.16-0.82)		
		≥150 g/day	209.0	8	48		0.43 (95% CI 0.18-1.04)		
	Women	Life-long abstainers	Life-long abstainers	25	66		1.00 (reference)		
		Ex-drinkers	Ex-drinkers				0.82 (95% CI 0.44-1.52)		
		<100 g/day	57.0	10	48		0.63 (95% CI 0.33-1.21)		
		≥100 g/day	136.0	9	18		1.21 (95% CI 0.65-2.28)		
Djoussé[22]	Men	Never drinkers	Never drinkers	37	476	Relative risk	1.00 (reference)	Age; BMI; education status; smoking status	8
		Former drinkers	Former drinkers				0.7 (95% CI 0.3-1.4)		
		<1 drink/week	0.4	13	326		0.5 (95% CI 0.3-0.9)		
		1-6 drinks/week	4.0	24	421		0.6 (95% CI 0.4-1.1)		
		≥7drinks/week	30.0	25	384		0.8 (95% CI 0.4-1.3)		
	Women	Never drinkers	Never drinkers	74	1,221		1.00 (reference)		
		Former drinkers	Former drinkers				1.2 (95% CI 0.6-2.3)		
		<1 drink/week	0.4	23	582		0.7 (95% CI 0.4-1.1)		
		1-6 drinks/week	4.0	13	400		0.6 (95% CI 0.3- 1.1)		
		≥7drinks/week	30.0	5	285		0.4 (95% CI 0.2-1.0)		

Study	Sex	Category	Dose	Cases	Total	Measure	Estimate	Adjustments	Score
Maty[23]	Men	0 drinks/month	0.0	21	373		1.00 (reference)		
		1-45 drinks/month	10.6	85	1,652		0.92 (95% CI 0.58-1.46)		
		≥46 drinks/month	25.4	34	591		1.02 (95% CI 0.60-1.73)		
						Relative risk		None	4
	Women	0 drinks/month	0.0	42	771		1.00 (reference)		
		1-45 drinks/month	10.6	116	1,969		1.08 (95% CI 0.76-1.52)		
		≥46 drinks/month	25.4	9	250		0.67 (95% CI 0.33-1.36)		
Onat[24,f]	Men	Non-drinkers	Non-drinkers	102	936		1.00 (reference)		
		<3 drinks/day	16.0	46	434		1.23 (95% CI 0.88-1.73)		
		>3 drinks/day	38.4	14	71		1.91 (95% CI 1.06-3.45)		
						Relative risk		Age; physical activity; smoking status	6
	Women	Non-drinkers	Non-drinkers	157	1,384		1.00 (reference)		
		<3 drinks/day	16.0	2	63		0.38 (95% CI 0.11-1.23)		
		>3 drinks/day	38.4	0	4		Too few data		
Roh[25]	Men	Non-drinkers	Non-drinkers	150	276		1.00 (reference)		
		1-14g/day	8.0	251	412		1.08 (95% CI 0.91-1.26)		
		15-29g/day	22.5	166	200	Relative risk	1.29 (95% CI 1.09-1.53)	None	5
		≥30g/day	36.0	123	139		1.33 (95% CI 1.11-1.60)		
Boggs[26]	Women	Never drinkers	Never drinkers	1,669	20,457		1.00 (reference)		
		Former drinkers	Former drinkers				1.22 (95% CI 1.13-1.31)		
		1-3 drinks/week	4.0	552	7,658		0.84 (95% CI 0.76-0.93)		
		4-6 drinks/week	10.0	132	2,530	Relative risk	0.60 (95% CI 0.51-0.72)	Age; questionnaire cycle; energy intake	5
		7-13 drinks/week	20.0	97	1,484		0.70 (95% CI 0.57-0.86)		
		≥14 drinks/week	33.6	43	654		0.71 (95% CI 0.52-0.96)		
Jee[27,f]	Men	0g/day	0.0	14,407	172,786		1.00 (reference)		
		1-24g/day	13.0	33,332	418,536		0.95 (95% CI 0.93–0.97)		
		25-49g/day	37.5	7,588	80,680		0.99 (95% CI 0.96–1.02)		
		50-99g/day	75.0	4,188	41,104		1.05 (95% CI 1.01–1.08)		
		≥100g/day	120.0	1,440	13,703	Hazard ratio	1.04 (95% CI 0.99–1.10)	Age; age^2; BMI; physical activity	8
	Women	0g/day	0.0	24,860	359,916		1.00 (reference)		
		1-24g/day	13.0	3,596	60,024		0.90 (95% CI 0.87–0.93)		
		25-49g/day	37.5	6	210		1.85 (95% CI 0.77–4.43)		
		≥50g/day	60.0	2	46		1.03 (95% CI 1.00–1.06)		

Nagaya[28]	Men	0g/day	0.0	212	3,940	Relative risk	1.00 (reference)	None	6
		<25g/day	12.5	198	4,035		0.92 (95% CI 0.76-1.11)		
		25-40g/day	32.5	223	4,071		1.02 (95% CI 0.85-1.22)		
		≥40g/day	48.0	236	3,913		1.11 (95% CI 0.93-1.33)		
	Women	0g/day	0.0	188	6,434		1.00 (reference)		
		<25g/day	12.5	30	1,413		0.73 (95% CI 0.50-1.07)		
		≥25g/day	30.0	6	297		0.70 (95% CI 0.31-1.56)		
Balkau[29,f]	Men	0g/day	0.0	18	206	Relative risk[d]	1.00 (reference)	Education; physical activity; smoking status	5
		<20g/day	2.0	27	411		0.77 (95% CI 0.42-1.40)		
		20-39g/day	23.0	79	844		0.84 (95% CI 0.49-1.40)		
		≥40g/day	67.0	47	244		1.27 (95% CI 0.73-2.16)		
	Women	0g/day	0.0	35	206		1.00 (reference)		
		<20g/day	1.0	35	411		0.95 (95% CI 0.59-1.48)		
		≥20g/day	21.0	22	1088		0.87 (95% CI 0.51-1.43)		
Beulens[30]	Men	0g/day	0.0	485	452	Hazard ratio[e]	1.00 (reference)	Age; BMI; coffee consumption; education status; fruit consumption; energy consumption; processed meat consumption; physical activity; red meat consumption; smoking status; vegetable consumption	8
		0.1-6.0g/day	3.1	1,303	1,262		1.03 (95% CI 0.86-1.24)		
		6.1-12.0g/day	9.1	890	891		0.93 (95% CI 0.79-1.09)		
		12.1-24.0g/day	18.1	1,116	1,166		0.97 (95% CI 0.83-1.13)		
		24.1-60.0g/day	42.1	1,448	1,555		0.89 (95% CI 0.77-1.02)		
		60.1-96.0g/day	78.1	393	363		0.80 (95% CI 0.65-0.99)		
		>96.0g/day	115.2	126	85		1.10 (95% CI 0.79-1.54)		
	Women	0g/day	0.0	1,601	2,013		1.00 (reference)		
		0.1-6.0g/day	3.1	2,429	3,828		0.91 (95% CI 0.86-0.96)		
		6.1-12.0g/day	9.1	743	1,483		0.75 (95% CI 0.66-0.84)		
		12.1-24.0g/day	18.1	623	1,322		0.79 (95% CI 0.70-0.90)		
		>24g/day	28.8	402	838		0.81 (95% CI 0.69-0.95)		

Study	Sex	Alcohol intake	g/day	Cases	Total	Effect measure	Effect (95% CI)	Adjustments	Score
Cullmann[31]	Men	Non-drinkers	Non-drinkers	10	62		1.00 (reference)		
		0.01-6.79g/day	3.4	46	501		0.62 (95% CI 0.32-1.19)		
		6.80-13.01g/day	9.9	28	488		0.41 (95% CI 0.23-0.73)		
		13.02-22.13g/day	17.6	41	505		0.56 (95% CI 0.33-0.96)		
		≥22.14g/day	26.6	50	486	Relative risk[d,e]	0.56 (95% CI 0.33-0.96)	Age; BMI; education; family history of diabetes; physical activity; smoking status	8
	Women	Non-drinkers	Non-drinkers	6	94		1.00 (reference)		
		0.01-1.49g/day	0.8	34	724		0.92 (95% CI 0.37-2.26)		
		1.50-4.71g/day	3.1	14	766		0.39 (95% CI 0.18-0.83)		
		4.72-8.75g/day	6.7	20	739		0.69 (95% CI 0.34-1.41)		
		≥8.76g/day	10.5	24	755		0.87 (95% CI 0.43-1.75)		
Sato[32]	Men	Non-drinkers	Non-drinkers	142	1,479		1.00 (reference)		
		0.1-2.0 standard drinks/day	14.7	350	4,055	Hazard ratio	0.94 (95% CI 0.78-1.15)	Age	5
		2.1-4.0 standard drinks/day	42.7	268	3,093		0.94 (95% CI 0.77-1.15)		
		≥4.1 standard drinks/day	68.9	118	1,126		1.16 (95% CI 0.91-1.48)		
Stringhini[33,f]	Men	0 units/week	0.0	85	623		1.00 (reference)		
		1-21 units/week	12.4	369	3,037		0.96 (95% CI 0.75-1.22)		
		≥21 units/week	25.2	102	825	Hazard ratio	1.04 (95% CI 0.77-1.39)	Age; ethnicity	5
	Women	0 units/week	0.0	111	540		1.00 (reference)		
		1-14 units/week	8.5	139	1,198		0.73 (95% CI 0.56-0.94)		
		≥14 units/week	16.8	13	195		0.51 (95% CI 0.28-0.92)		
Teratani[34,f]	Men	Non-drinkers	Non-drinkers	131	2,287		1.00 (reference)		
		1-76g/week	6.3	71	1,677		0.81 (95% CI 0.61, 1.08)		
		77-153g/week	15.7	73	1,243	Hazard ratio	0.94 (95% CI 0.70, 1.26)	None	4
		154-307g/week	22.0	85	1,469		0.95 (95% CI 0.72, 1.25)		
		≥308g/week	44.0	104	1,283		1.14 (95% CI 0.88, 1.49)		

Study	Sex	Exposure category	Dose (g/day)	Cases	Non-cases	Effect measure	Effect estimate	Adjustments	Score
Abbasi[35,f]	Men	No/Almost never	No/Almost never	47	496		1.00 (reference)	None	6
		1-4 drinks/month	0.8	32	379		0.90 (95% CI 0.58-1.38)		
		2-7 drinks/week	6.3	76	1,121		0.73 (95% CI 0.52-1.04)		
		1-3 drinks/day	19.8	53	768		0.75 (95% CI 0.51-1.09)		
		≥4 drinks/day	47.5	18	257	Relative risk	0.76 (95% CI 0.45-1.28)		
	Women	No/Almost never	No/Almost never	70	1,106		1.00 (reference)		
		1-4 drinks/month	0.8	39	655		0.94 (95% CI 0.65-1.38)		
		2-7 drinks/week	6.3	34	1,084		0.51 (95% CI 0.34-0.76)		
		1-3 drinks/day	19.8	22	491		0.72 (95% CI 0.45-1.15)		
		≥4 drinks/day	47.5	3	69		0.70 (95% CI 0.23-2.17)		
Heianza[36,f]	Men	Lifetime abstainers	Lifetime abstainers	15	138		1.00 (reference)	Age	7
		Former drinkers	Former drinkers				2.83 (95% CI 1.27-6.31)		
		8-54g/week	2.9	35	199		1.74 (95% CI 0.95-3.19)		
		55-98g/week	10.9	31	214		1.54 (95% CI 0.83-2.86)		
		99-160g/week	17.6	23	221	Relative risk	0.94 (95% CI 0.49-1.80)		
		161-229g/week	24.7	30	230		1.43 (95% CI 0.76-2.66)		
		230-287g/week	32.9	37	236		1.61 (95% CI 0.88-2.93)		
		288-748g/week	66.3	35	166		2.38 (95% CI 1.29-4.38)		
Rasouli[37,f]	Men	Abstainers	0.0	44	1,513		1.00 (reference)	Age; BMI; education status; family history of diabetes mellitus; physical activity; smoking status	7
		0.01-4.9g/day	1.7	324	11,343		0.94 (95% CI 0.66-1.35)		
		5.0-9.9g/day	6.9	96	3,855		0.81 (95% CI 0.54-1.22)		
		10.0-14.9g/day	11.7	18	1,387		0.46 (95% CI 0.25-0.85)		
		≥15g/day	19.7	16	807	Hazard ratio	0.79 (95% CI 0.42-1.46)		
	Women	Abstainers	0.0	74	3,342		1.00 (reference)		
		0.01-4.9g/day	1.1	330	15,774		1.34 (95% CI 0.99-1.83)		
		5.0-9.9g/day	6.6	33	2,220		1.37 (95% CI 0.86-2.20)		
		≥10g/day	12.0	5	504		1.12 (95% CI 0.44-2.85)		
Shi[38,f]	Men	Non-drinker	Non drinker	894	33,415		1.00 (reference)	Age; BMI; education status; energy intake; family history of diabetes mellitus; hypertension; income; occupation; physical activity; smoking status; waist-hip ratio	6
		<1 drink/day	9.6	74	3,115		0.88 (95% CI 0.70-1.12)		
		1-2.9 drinks/day	26.0	169	8,349	Hazard ratio	0.80 (95% CI 0.67-0.94)		
		≥3 drinks/day	53.6	101	3,973		0.91 (95% CI 0.74-1.13)		

[a] The upper limit of the highest exposure category conservatively defined as the lower bound multiplied by 1.2, unless explicitly defined within each publication.

[b] Conversions into g/day were undertaken according to average intake in each consumption category. Averages were equal to category-specific means/medians. Where unreported, the median of the upper and lower bounds were used.

[c] Figures from personal correspondence and reflect the crude number of cases/non-cases in each exposure category. These figures therefore differ slightly from the numbers contained within the analytical sample of the original study from which relative risks were reported. Figures reported in the 2x2 table used only for the estimation of covariance between coefficients. The sum total of cases and non-cases in the analytical sample was 41 and 2,271 respectively.

[d] Relative risks estimated from reported odds ratios according to the Zhang and Yu formula $\sim RR=OR/(1-p_u)+(p_u*OR)$, where p_u was equal to the incidence of T2DM among unexposed referent participants.

[e] Effect estimates recalculated according to a referent group other than that originally reported. This was undertaken using the Hamling method, as described in-text.

[f] Additional, updated or recalculated data provided via personal correspondence and may differ from that reported within the original published document.
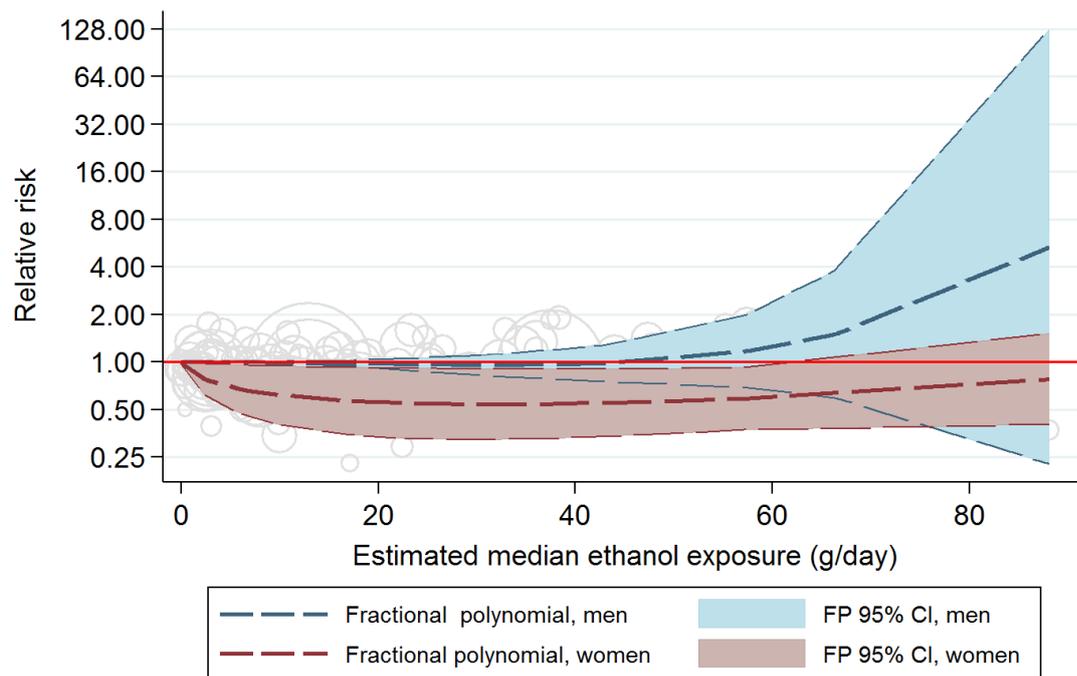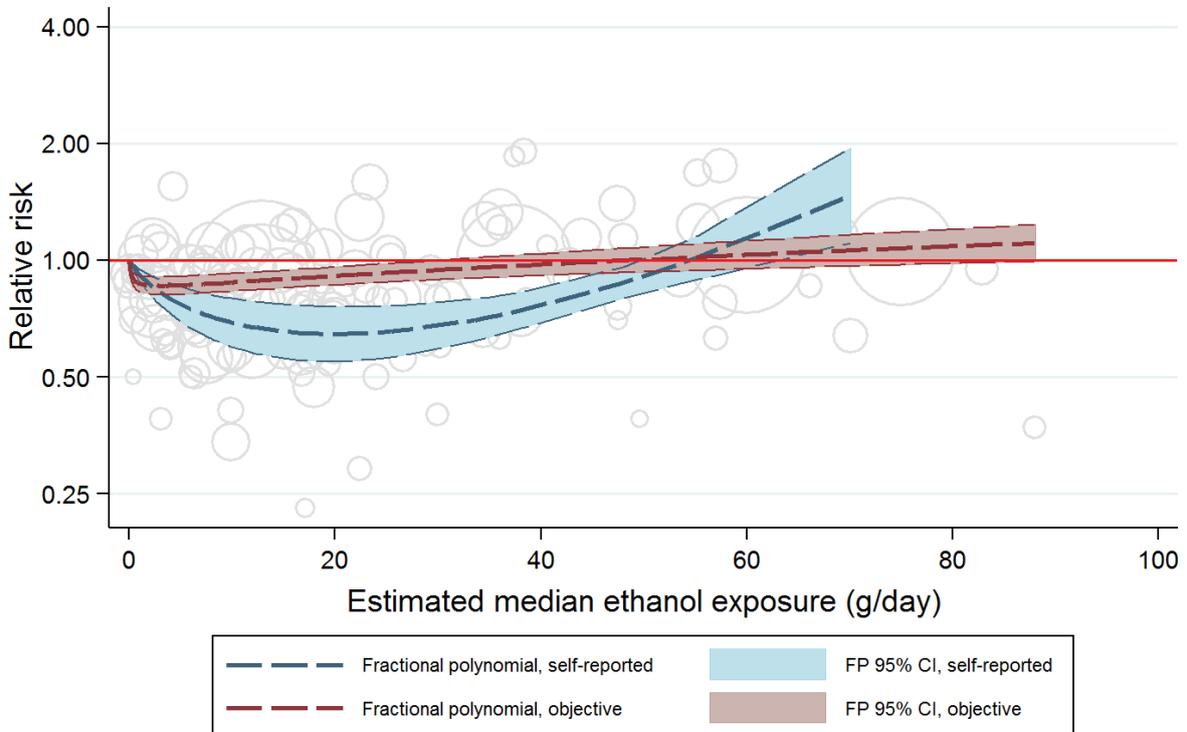
Supplemental Figure S1 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus, stratified by sex and limited to studies utilising a strictly-defined never drinking reference group
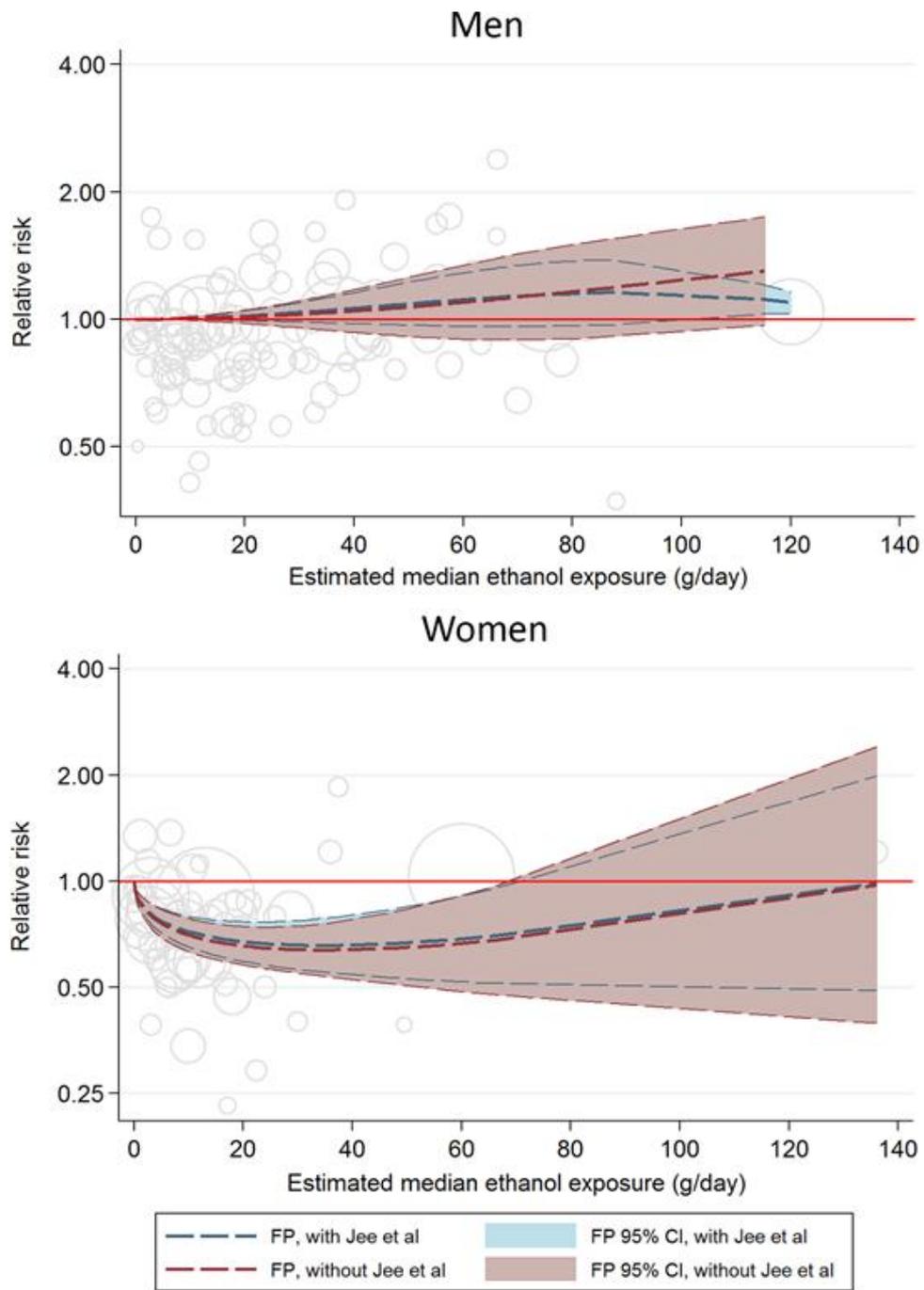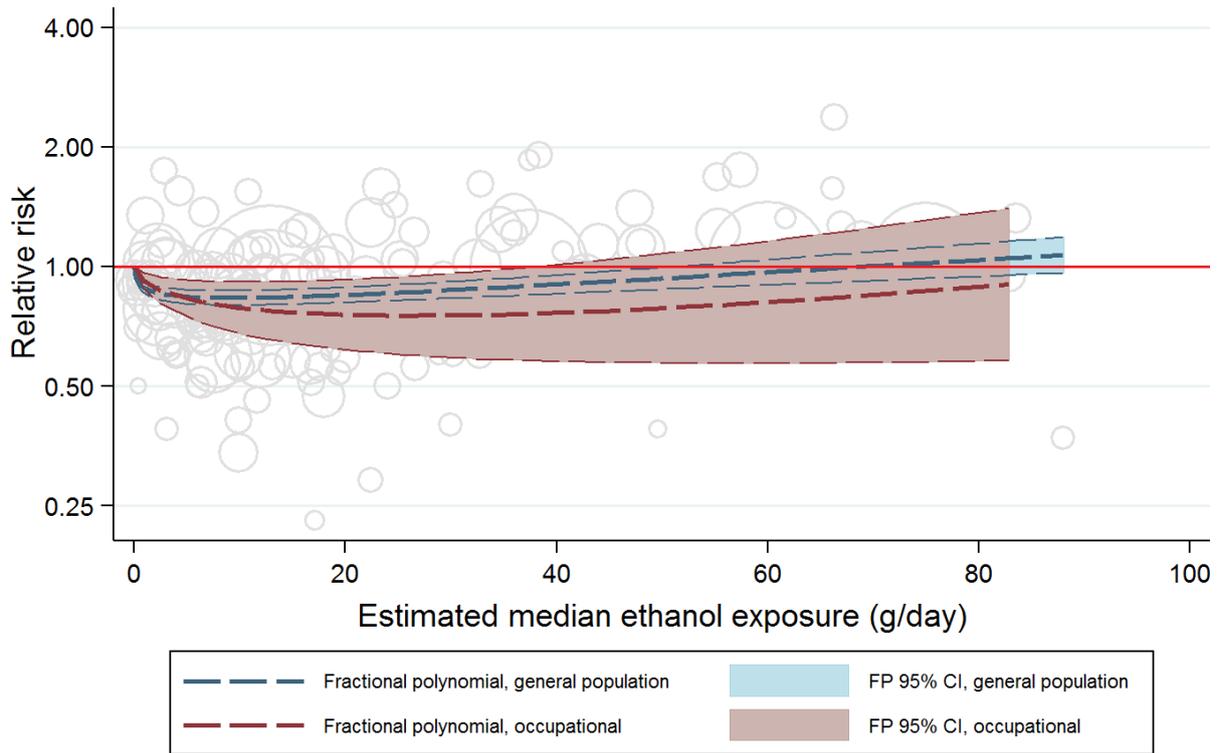
Supplemental Figure S2 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus: sex-specific data stratified according to whether data from Jee and colleagues (27) were included
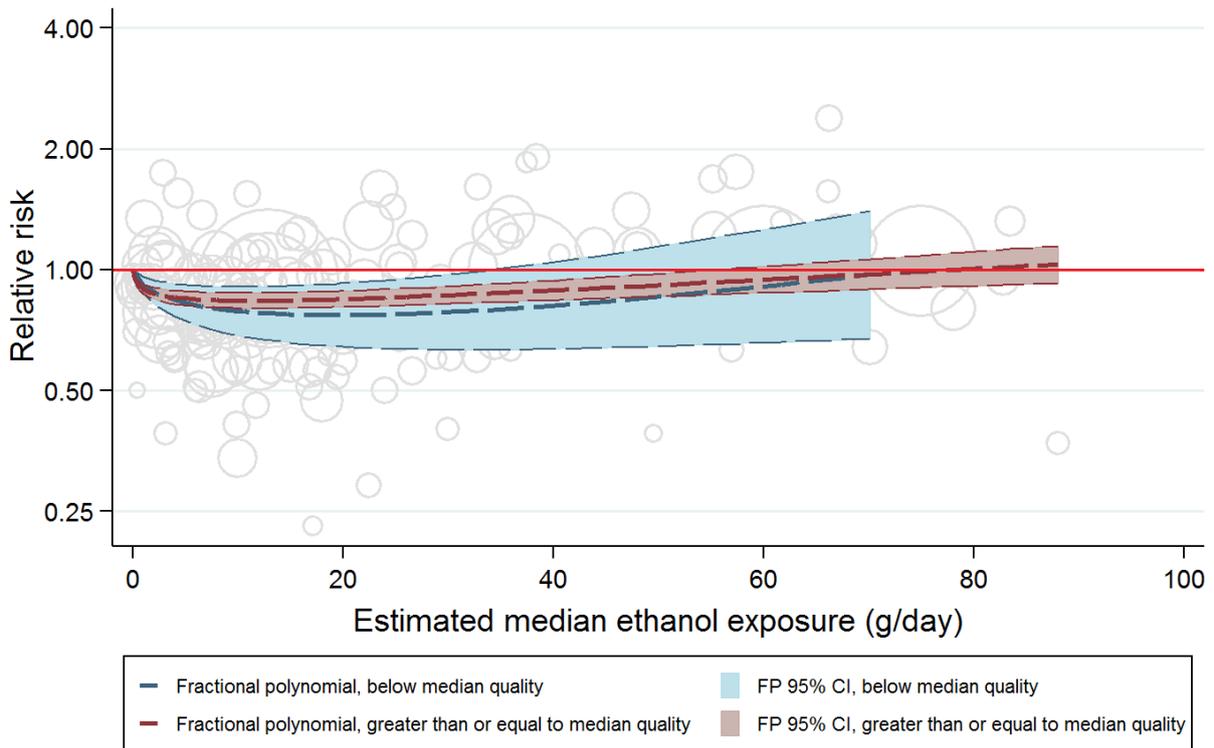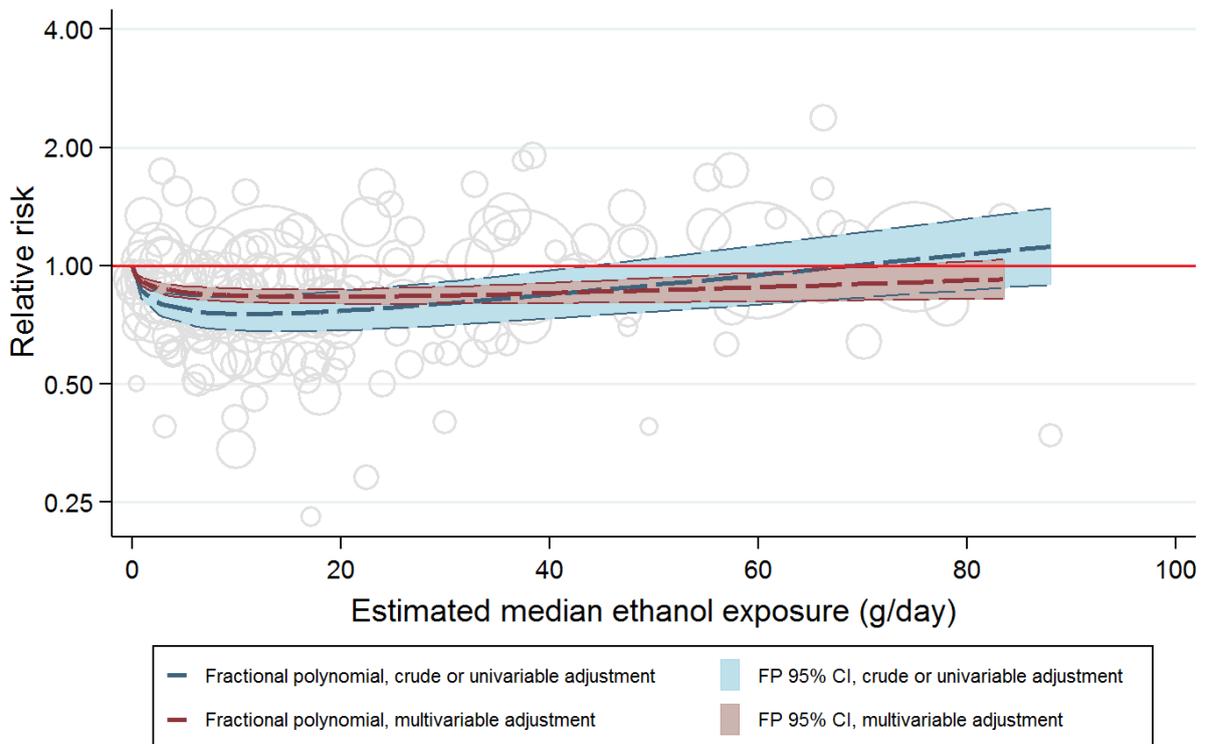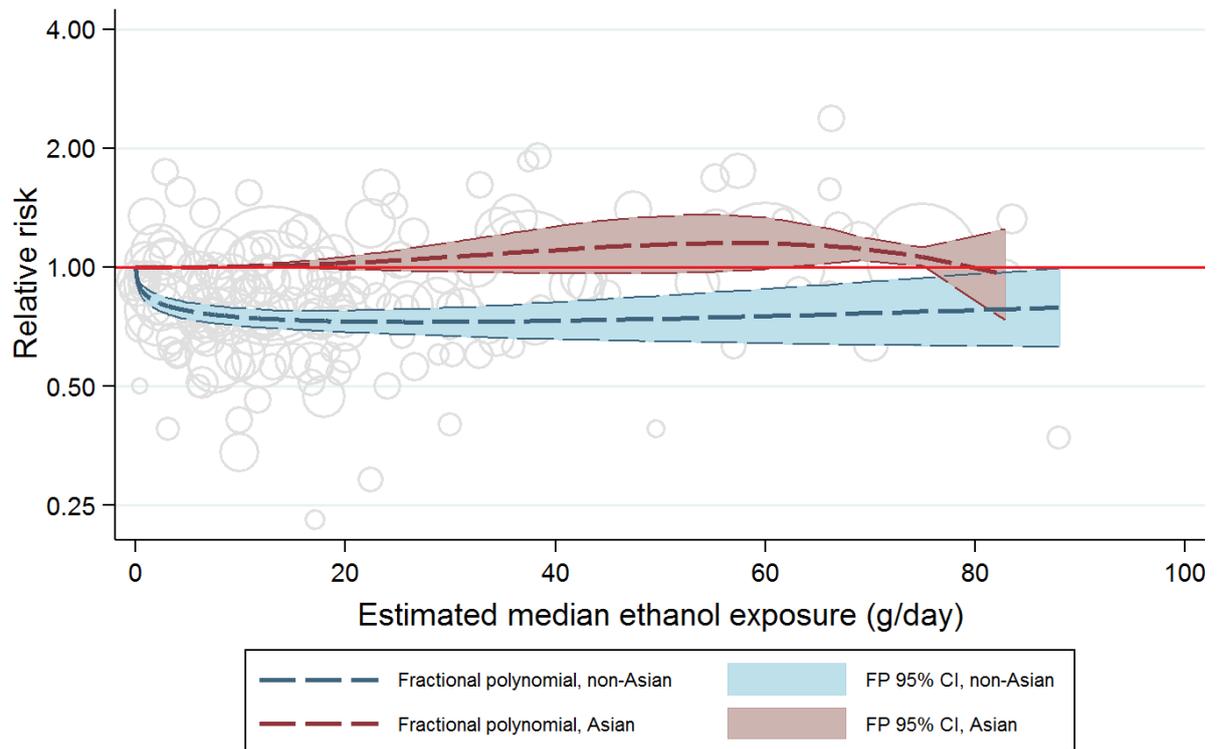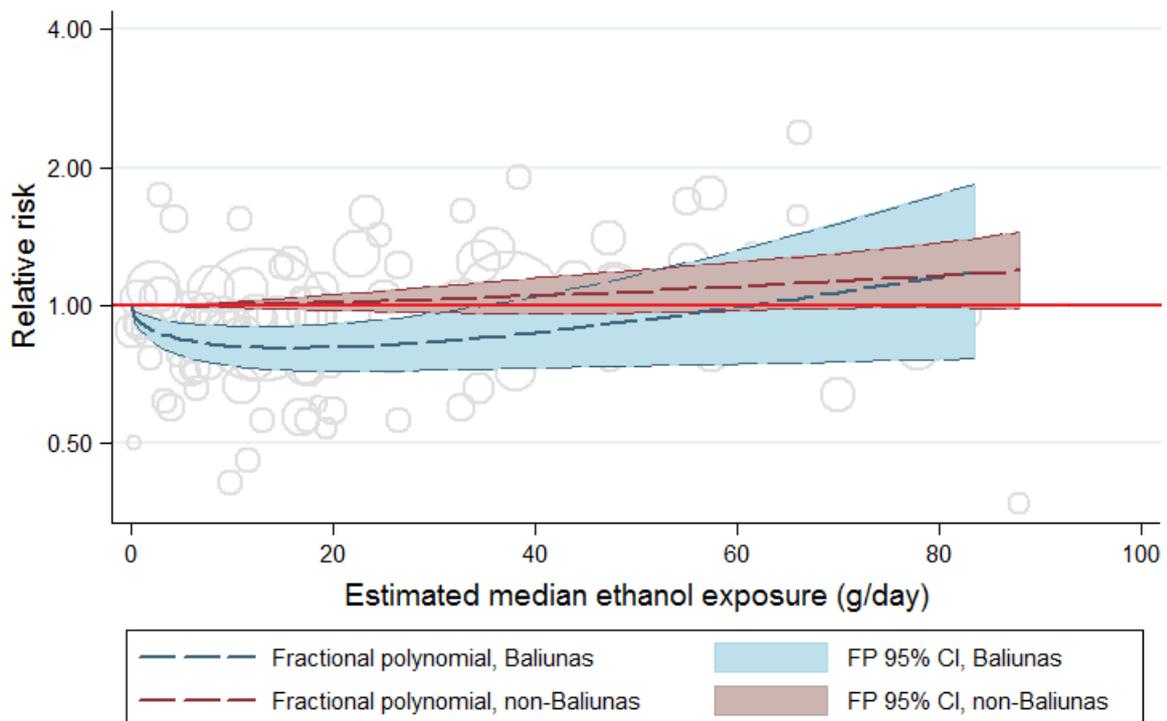
Supplemental Figure S3 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus, stratified according to whether studies were above or below median quality as judged using the Newcastle-Ottawa assessment tool

Supplemental Figure S4 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus, stratified by method of case ascertainment

Supplemental Figure S5 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus, stratified by population type

Supplemental Figure S6 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus, stratified by the degree of confounder adjustment

Supplemental Figure S7 Dose-response relationship between average daily alcohol consumption and incident type 2 diabetes mellitus, stratified by population region

Supplemental Figure S8 Dose-response relationship between average daily alcohol consumption and incident T2DM: male data stratified by whether or not the data had been included in the 2009 meta-analysis undertaken by Baliunas et al.

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