

Supplementary Table S3. Newcastle-Ottawa Scale of included studies

First author	Year	Selection				Comparability		Exposure ^a /Outcome ^b			Total
		(1)	(2)	(3)	(4)	(5A)	(5B)	(6)	(7)	(8)	
Ming-Whei Yu ^{1a}	1993	1	1	1	1	1	1	1	1	1	9
Jian-Min Yuan ^{2a}	1995	1	1	1	1	1	0	1	1	1	8
Nathalie Ganne-Carrie ^{3b}	1997	0	1	1	1	1	0	1	1	1	7
Anthony J. Alberg ^{4a}	2000	1	1	1	1	1	0	1	1	1	8
Keitaro Tanaka ^{5b}	2000	0	1	1	1	1	1	1	1	1	8
Ming-Whei Yu ^{6a}	2001	1	1	1	1	1	1	1	1	1	9
Marc J. Gunter ^{7c}	2008	1	1	1	1	1	1	1	1	0	8
Tess V. Clendenen ^{8a}	2009	1	1	1	1	1	1	1	1	1	9
Jennifer H Lin ^{9a}	2013	0	1	1	1	1	1	1	1	0	7
Annekatriin Lukanova ^{10a}	2014	1	1	1	1	1	1	1	1	0	8
D. D Ørsted ^{11b}	2014	1	1	1	1	1	1	1	1	1	9
Roni T. Falk ^{12c}	2015	1	1	1	0	1	1	1	1	0	7
Neil Murphy ^{13a}	2015	1	1	1	1	1	1	1	1	0	8
Yi X. Chan ^{14b}	2017	1	1	1	1	1	1	1	1	0	8
Yi X. Chan ^{15b}	2018	1	1	1	1	1	1	1	1	0	8
Nagisa Mori ^{16a}	2019	1	1	1	1	1	1	1	1	0	8
Jessica L. Petrick ^{17a}	2019	0	1	1	1	1	1	1	1	1	8
Jessica L. Petrick ^{18a}	2020	1	1	1	0	1	1	1	1	1	8
Rita Peila ^{19b}	2020	0	1	1	1	1	1	1	1	1	8
Rita Peila ^{20b}	2020	0	1	1	1	1	1	1	1	0	7
Shao-Hua Xie ^{21a}	2020	0	1	1	1	1	1	1	1	1	8
Terry Cheuk-Fung Yip ^{22b}	2020	1	1	1	0	1	1	1	1	0	7
Una C. McMenamin ^{23b}	2021	0	1	1	1	1	1	1	1	0	7
Kara A. Michels ^{24c}	2021	1	1	1	0	1	1	1	1	0	7
Nagisa Mori ^{25a}	2021	1	1	1	1	1	1	1	1	1	9
Eleanor L. Watts ^{26b}	2021	0	1	1	1	1	1	1	1	0	7
Zhikai Zhu ^{27a}	2021	1	1	1	1	1	1	1	1	1	9
Justin Harbs ^{28a}	2022	1	1	1	1	1	1	1	1	1	9
Muktar Ahmed ^{29b}	2023	0	1	1	1	1	1	1	1	0	7

^a Nested case-control study: (1) Is the case definition adequate? (2) Representativeness of the cases; (3) Selection of controls; (4) Definition of controls; (5) Comparability of cases and controls on the basis of the design or analysis: (5A) control age (or other important factors); (5B) Control other factors; (6) Ascertainment of exposure; (7) Same method of ascertainment for cases and controls; (8) Non-response rate.

^b Cohort study: (1) Representativeness of the exposed cohort; (2) Selection of the non-exposed cohort; (3) Ascertainment of exposure; (4) Demonstration that outcome of interest was not present at start of study; (5) Comparability of cohorts on the basis of the design or analysis: (5A) control age (or other important factors); (5B) control other factors; (6) Assessment of outcome; (7) Was follow-up long enough for outcomes to occur; (8) Adequacy of follow up of cohorts.

^c Case-cohort study: according to the items of the nested case-control study.

References

1. Yu MW, Chen CJ. Elevated serum testosterone levels and risk of hepatocellular carcinoma. *Cancer Res* 1993;53(4):790–4.
2. Yuan JM, Ross RK, Stanczyk FZ, et al. A cohort study of serum testosterone and hepatocellular carcinoma in Shanghai, China. *Int J Cancer* 1995;63(4):491–3.
3. Ganne-Carrie N, Chastang C, Uzzan B, et al. Predictive value of serum sex hormone binding globulin for the occurrence of hepatocellular carcinoma in male patients with cirrhosis. *J Hepatol* 1997;26(1):96–102.
4. Alberg AJ, Gordon GB, Hoffman SC, et al. Serum dehydroepiandrosterone and dehydroepiandrosterone sulfate and the subsequent risk of developing colon cancer. *Cancer Epidemiol Biomarkers Prev* 2000;9(5):517–21.
5. Tanaka K, Sakai H, Hashizume M, et al. Serum testosterone:estradiol ratio and the development of hepatocellular carcinoma among male cirrhotic patients. *Cancer Res* 2000;60(18):5106–10.
6. Yu MW, Yang YC, Yang SY, et al. Hormonal markers and hepatitis B virus-related hepatocellular carcinoma risk: a nested case-control study among men. *J Natl Cancer Inst* 2001;93(21):1644–51.
7. Gunter MJ, Hoover DR, Yu H, et al. Insulin, insulin-like growth factor-I, endogenous estradiol, and risk of colorectal cancer in postmenopausal women. *Cancer Res* 2008;68(1):329–37.
8. Clendenen TV, Koenig KL, Shore RE, et al. Postmenopausal levels of endogenous sex hormones and risk of colorectal cancer. *Cancer Epidemiol Biomarkers Prev* 2009;18(1):275–81.
9. Lin JH, Zhang SM, Rexrode KM, et al. Association between sex hormones and colorectal cancer risk in men and women. *Clin Gastroenterol Hepatol* 2013;11(4):419-424.e1.
10. Lukanova A, Becker S, Husing A, et al. Prediagnostic plasma testosterone, sex hormone-binding globulin, IGF-I and hepatocellular carcinoma: etiological factors or risk markers? *Int J Cancer* 2014;134(1):164–73.
11. Orsted DD, Nordestgaard BG, Bojesen SE. Plasma testosterone in the general population, cancer prognosis and cancer risk: a prospective cohort study. *Ann Oncol* 2014;25(3):712–8.
12. Falk RT, Dallal CM, Lacey JV, et al. Estrogen Metabolites Are Not Associated with Colorectal Cancer Risk in Postmenopausal Women. *Cancer Epidemiol Biomarkers Prev* 2015;24(9):1419–22.
13. Murphy N, Strickler HD, Stanczyk FZ, et al. A Prospective Evaluation of Endogenous Sex Hormone Levels and Colorectal Cancer Risk in Postmenopausal Women. *J Natl Cancer Inst* 2015;107(10):djv210.
14. Chan YX, Alfonso H, Chubb SAP, et al. Higher Dihydrotestosterone Is Associated with the Incidence of Lung Cancer in Older Men. *Horm Cancer* 2017;8(2):119–26.
15. Chan YX, Knuijan MW, Divitini ML, et al. Lower Circulating Androgens Are Associated with Overall Cancer Risk and Prostate Cancer Risk in Men Aged 25-84 Years from the Busselton Health Study. *Horm Cancer* 2018;9(6):391–8.
16. Mori N, Sawada N, Iwasaki M, et al. Circulating sex hormone levels and colorectal cancer

- risk in Japanese postmenopausal women: The JPHC nested case-control study. *Int J Cancer* 2019;145(5):1238–44.
17. Petrick JL, Hyland PL, Caron P, et al. Associations Between Prediagnostic Concentrations of Circulating Sex Steroid Hormones and Esophageal/Gastric Cardia Adenocarcinoma Among Men. *J Natl Cancer Inst* 2019;111(1):34–41.
 18. Petrick JL, Florio AA, Zhang X, et al. Associations Between Prediagnostic Concentrations of Circulating Sex Steroid Hormones and Liver Cancer Among Postmenopausal Women. *Hepatology* 2020;72(2):535–47.
 19. Peila R, Arthur RS, Rohan TE. Sex hormones, SHBG and risk of colon and rectal cancer among men and women in the UK Biobank. *Cancer Epidemiol* 2020;69:101831.
 20. Peila R, Arthur RS, Rohan TE. Association of Sex Hormones with Risk of Cancers of the Pancreas, Kidney, and Brain in the UK Biobank Cohort Study. *Cancer Epidemiol Biomarkers Prev* 2020;29(9):1832–6.
 21. Xie SH, Ness-Jensen E, Rabbani S, et al. Circulating Sex Hormone Levels and Risk of Esophageal Adenocarcinoma in a Prospective Study in Men. *Am J Gastroenterol* 2020;115(2):216–23.
 22. Yip TC, Wong GL, Chan HL, et al. Elevated testosterone increases risk of hepatocellular carcinoma in men with chronic hepatitis B and diabetes mellitus. *J Gastroenterol Hepatol* 2020;35(12):2210–9.
 23. McMenamin UC, Liu P, Kunzmann AT, et al. Circulating Sex Hormones Are Associated With Gastric and Colorectal Cancers but Not Esophageal Adenocarcinoma in the UK Biobank. *Am J Gastroenterol* 2021;116(3):522–9.
 24. Michels KA, Geczik AM, Bauer DC, et al. Endogenous Progestogens and Colorectal Cancer Risk among Postmenopausal Women. *Cancer Epidemiol Biomarkers Prev* 2021;30(6):1100–5.
 25. Mori N, Keski-Rahkonen P, Gicquiau A, et al. Endogenous Circulating Sex Hormone Concentrations and Colon Cancer Risk in Postmenopausal Women: A Prospective Study and Meta-Analysis. *JNCI Cancer Spectr* 2021;5(6):pkab084.
 26. Watts EL, Perez-Cornago A, Knuppel A, et al. Prospective analyses of testosterone and sex hormone-binding globulin with the risk of 19 types of cancer in men and postmenopausal women in UK Biobank. *Int J Cancer* 2021;149(3):573–84.
 27. Zhu Z, Chen Y, Ren J, et al. Serum Levels of Androgens, Estrogens, and Sex Hormone Binding Globulin and Risk of Primary Gastric Cancer in Chinese Men: A Nested Case-Control Study. *Cancer Prev Res (Phila)* 2021;14(6):659–66.
 28. Harbs J, Rinaldi S, Gicquiau A, et al. Circulating Sex Hormone Levels and Colon Cancer Risk in Men: A Nested Case-Control Study and Meta-Analysis. *Cancer Epidemiol Biomarkers Prev* 2022;31(4):793–803.
 29. Ahmed M, Mäkinen V-P, Lumsden A, et al. Metabolic profile predicts incident cancer: A large-scale population study in the UK Biobank. *Metabolism* 2023;138:155342.