

## Supplementary material 3: Included studies for main and sensitivity analyses.

Author	Year	Outcome	Number of studies			Selection discussion	Reason for exclusion	Random effect model performed in the original meta-analysis*	
			Cohort	Case-Control	Total			RR/OR/HR (High vs low)	95%CI
<b>All-cause mortality</b>									
Coenen et al. (1)	2018	All-cause mortality	17	0	17	Included		Males= <b>HR=1.18</b> Females= <b>HR=0.90</b>	Males= <b>(1.05-1.34)</b> Females= <b>(0.80-1.01)</b>
Samitz G et al. (2)	2012	All-cause mortality	6	0	6	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Fewer studies than Coenen et al.	Both <b>OR=0.83</b> Males= <b>OR=0.94</b> Females= <b>OR=0.66</b>	Both <b>(0.71-0.97)</b> Males= <b>(0.75-1.19)</b> Females= <b>(0.49-0.89)</b>
<b>Cardio-vascular diseases</b>									
Wendel-Vos et al. (3)	2004	Stroke	11	0	11	Included		Stroke= <i>Physical active vs inactive</i> <b>RR=0.74</b> <i>Physical active vs moderate</i> <b>RR= 0.92</b> Ischemic stroke= <i>Physical active vs inactive</i> <b>RR= 0.57</b> <i>Physical active vs moderate</i> <b>RR= 0.84</b>	<b>(0.49-1.12)</b> <b>(0.68-1.24)</b> <b>(0.43-0.77)</b> <b>(0.60-0.98)</b>

Sattelmair et al. (4)	2011	Coronary Heart Disease	4	0	4	Included		CHD <b>RR=0.84</b>	<b>0.79-0.90</b>
Li J et al. (5)	2013	CVD/CHD/Unclassified CVD	-	-	-	Excluded	Critically low AMSTAR	-	
<b>Colon cancer</b>									
Mahmood et al. (6)	2017	Colon cancer	10	5	15	Included		<b>RR=0.74</b>	<b>(0.67-0.82)</b>
Robsahm et al. (7)	2013	Proximal Distal	5	0	5	Included		Proximal colon cancer <b>RR=0.59</b> Distal Colon cancer <b>RR=0.61</b>	<b>(0.53-0.66)</b> <b>(0.53-0.70)</b>
Boyle et al. (8)	2012	Proximal Distal	6	4	10	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Lower AMSTAR score than Boyle	Proximal colon <b>RR=0.72</b> Distal colon <b>RR=0.75</b>	<b>(0.61-0.85)</b> <b>(0.66-0.83)</b>
Wolin et al. (9)	2009	Colon cancer	-	-	-	Excluded	Critically low AMSTAR score		
Samad et al. (10)	2005	Colon cancer	-	-	-	Excluded	Critically low AMSTAR score		
<b>Rectal cancer</b>									
Mahmood et al. (6)	2017	Rectal cancer	5	7	12	Included		<b>RR=0.88</b>	<b>(0.79-0.98)</b>
Robsahm et al. (7)	2013	Rectal cancer	3	0	3	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Fewer studies included than Mahmood.	<b>RR=0.80</b>	<b>(0.72-0.89)</b>
<b>Breast cancer</b>									
Pizot et al. (11)	2015	Breast cancer	11	0	11	Included		<b>RR=0.88</b>	<b>(0.82-0.95)</b>
Chen et al (12)	2019	Breast cancer	6	0	6	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Fewer studies included than Pizot.	<b>RR=0.91</b>	<b>(0.84-0.99)</b>
Wu Y et al (13)	2013	Breast cancer	7	0	7	Included sensitivity analyses	Fewer studies included than Pizot	<b>RR=0.90</b>	<b>0.83-0.97)</b>

						Excluded (Funnel plot)			
<b>Endometrial cancer</b>									
Schmid et al. (14)	2015	Endometrial cancer	12	7	19	Included		<b>RR=0.81</b>	<b>0.75-0.87</b>
Voskuil et al. (15)	2007	Endometrial cancer	4	10	14	Included sensitivity analyses Excluded (Funnel plot)	Fewer studies included than Pizot, and lower GRADE score	Case Control studies <b>0.80</b> Cohort studies <b>Not estimated</b>	<b>0.66-0.96</b>
<b>Lymphoma</b>									
Vermaete et al. (16)	2013	Lymphoma	1	4	5	Included		<b>OR=0.98</b>	<b>(0.80-1.21)</b>
<b>Gastric cancer</b>									
Chen et al. (17)	2014	Gastric	3	3	6	Included		<b>RR=0.79</b>	<b>(0.65-0.95)</b>
Behrens et al. (18)	2014	Gastric	4	3	7	Included sensitivity analyses Excluded (Funnel plot)	Lower GRADE score than Chen	<b>RR=0.84</b>	<b>(0.70-1.02)</b>
Singh et al. (19)	2014	Gastric	2	4	6	Included sensitivity analyses Excluded (Funnel plot)	Lower GRADE score than Chen	<b>OR=0.90</b>	<b>(0.69-1.18)</b>
Psaltopoulou et al. (20)	2016	Gastric	2	3	5	Included sensitivity analyses Excluded (Funnel plot)	Lower GRADE score than Chen	<b>RR=0.89</b>	<b>(0.62-1.27)</b>
<b>Oesophageal cancer</b>									
Behrens et al. (18)	2014	Oesophageal	4	2	6	Included		<b>RR=0.91</b>	<b>(0.46-1.81)</b>
Chen et al. (17)	2014	Oesophageal	-	-	-	Excluded	Not enough studies about oesophageal		
<b>Renal</b>									

Behrens et al. (21)	2013	Renal	6	5	11	Included		<b>RR=0.91</b>	<b>(0.79-1.04)</b>
Shephard et al. (22)	2016	Renal	7	7	14	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Did not provide meta-analyses	No meta-analyses only narrative	
<b>Prostate</b>									
Liu et al. (23)	2011	Prostate	9	18	27	Included		Combined <b>RR=0.81</b> Cohort <b>RR= 0.91</b> Case control <b>RR= 0.71</b> High quality studies (13) <b>RR = 0.86</b> Low quality studies <b>RR 0.75</b>	<b>(0.73-0.91)</b> <b>(0.87-0.95)</b> <b>(0.62-0.87)</b> <b>(0.78-0.94)</b> <b>(0.61-0.94)</b>
Benke et al. (24).	2018	Prostate	28	-	-	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Lower GRADE score than Liu	Overall <b>RR=0.91</b> Long term (10 years) <b>RR=0.83</b>	<b>(0.82-1.01)</b> <b>(0.71-0.98)</b>
Shephard et al. (25)	2017	Prostate	19	16	35	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	Lower GRADE score than Liu	No meta analysis	
KrsteV et al. (26)	2019	Prostate	-	-	-	Excluded	Excluded because of critically low AMSTAR	-	
<b>Pancreatic cancer</b>									
O Rorke et al. (27)	2010	Pancreatic	4	-	4	Included		<b>RR=0.75</b>	<b>(0.59-0.96)</b>
Bao et al (28)	2008	Pancreatic	3	-	3	Included sensitivity analyses	Lower included studies	<b>RR=0.75</b>	<b>(0.58-0.96)</b>

						Excluded (funnel plots)			
<b>Bladder cancer</b>									
Keimling et al. (29)	2014	Bladder cancer	-	-	-	Excluded	Excluded because of critically low AMSTAR	-	-
<b>Diabetes Mellitus type 2</b>									
Aune et al. (30)	2015	Diabetes type 2	3	0	3	Included		<b>RR=0.85</b>	<b>(0.79-0.92)</b>
<b>Osteoarthritis</b>									
McWilliams (31)	2011	Knee osteoarthritis	2	6	8	Included		Knee osteoarthritis <b>OR=1.45</b>	<b>(1.20-1.76)</b>
Gignac et al. (32)	2019	Osteoarthritis	6	2	3	Included sensitivity analyses <b>Excluded (Funnel plot)</b>	No-meta analysis	-	
Palmer et al (33)	2012	Osteoarthritis	-	-	-	Excluded	Excluded because of critically low AMSTAR		
<b>Mental Health</b>									
White et al. (34)	2017	Mental-Health Mental-Ill Health	1	12	13	Included		Mental ill-health <b>R=0.10</b> Mental health <b>R=0.13</b>	<b>(0.04-0.16)</b> <b>(0.08-0.18)</b>
<b>Insomnia</b>									
Yang (35)	2018	Insomnia	3	4	7	Included		<b>OR=2.76</b>	<b>(1.71-4.45)</b>
<b>Hypertension</b>									
Hauai (36)	2013	Hypertension	6	0	6	Included		High level OPA <b>RR=0.93</b> Moderate level OPA <b>RR=0.96</b>	<b>(0.81-1.08)</b> <b>(0.87-1.06)</b>

## References

1. Coenen P, Huysmans MA, Holtermann A, Krause N, van Mechelen W, Straker LM, et al. Do highly physically active workers die early? A systematic review with meta-analysis of data from 193 696 participants. *British journal of sports medicine*. 2018;52(20):1320-6.
2. Samitz G, Egger M, Zwahlen M. Domains of physical activity and all-cause mortality. Systematic review and dose-response meta-analysis of cohort studies. *Gynakologische Praxis*. 2012;36(1):137-43.
3. Wendel-Vos GC, Schuit AJ, Feskens EJ, Boshuizen HC, Verschuren WM, Saris WH, et al. Physical activity and stroke. A meta-analysis of observational data. *International journal of epidemiology*. 2004;33(4):787-98.
4. Sattelmair J, Pertman J, Ding EL, Kohl HW, 3rd, Haskell W, Lee IM. Dose response between physical activity and risk of coronary heart disease: a meta-analysis. *Circulation*. 2011;124(7):789-95.
5. Li J, Loerbroeks A, Angerer P. Physical activity and risk of cardiovascular disease: What does the new epidemiological evidence show? *Current opinion in cardiology*. 2013;28(5):575-83.
6. Mahmood S, MacInnis RJ, English DR, Karahalios A, Lynch BM. Domain-specific physical activity and sedentary behaviour in relation to colon and rectal cancer risk: A systematic review and meta-analysis. *International journal of epidemiology*. 2017;46(6):1797-813.
7. Robsahm TE, Aagnes B, Hjartaker A, Langseth H, Bray FI, Larsen IK. Body mass index, physical activity, and colorectal cancer by anatomical subsites: a systematic review and meta-analysis of cohort studies. *European journal of cancer prevention : the official journal of the European Cancer Prevention Organisation (ECP)*. 2013;22(6):492-505.
8. Boyle T, Keegel T, Bull F, Heyworth J, Fritschi L. Physical activity and the risk of proximal colon and distal colon cancers: A systematic review and meta-analysis. *Journal of science and medicine in sport*. 2012;15:S332-S3.
9. Wolin KY, Yan Y, Colditz GA, Lee IM. Physical activity and colon cancer prevention: a meta-analysis. *British journal of cancer*. 2009;100(4):611-6.
10. Samad AK, Taylor RS, Marshall T, Chapman MA. A meta-analysis of the association of physical activity with reduced risk of colorectal cancer. *Colorectal disease : the official journal of the Association of Coloproctology of Great Britain and Ireland*. 2005;7(3):204-13.
11. Pizot C, Boniol M, Mullie P, Koechlin A, Boniol M, Boyle P, et al. Physical activity, hormone replacement therapy and breast cancer risk: A meta-analysis of prospective studies. *European Journal of Cancer*. 2016;52:138-54.
12. Chen X, Wang Q, Zhang Y, Xie Q, Tan X. Physical Activity and Risk of Breast Cancer: A Meta-Analysis of 38 Cohort Studies in 45 Study Reports. *Value in Health*. 2019;22(1):104-28.
13. Wu Y, Zhang D, Kang S. Physical activity and risk of breast cancer: a meta-analysis of prospective studies. *Breast cancer research and treatment*. 2013;137(3):869-82.
14. Schmid D, Behrens G, Keimling M, Jochem C, Ricci C, Leitzmann M. A systematic review and meta-analysis of physical activity and endometrial cancer risk. *European journal of epidemiology*. 2015;30(5):397-412.
15. Voskuil DW, Monninkhof EM, Elias SG, Vlems FA, Van Leeuwen FE. Physical activity and endometrial cancer risk, a systematic review of current evidence. *Cancer Epidemiology Biomarkers and Prevention*. 2007;16(4):639-48.
16. Vermaete NV, Wolter P, Verhoef GE, Kollen BJ, Kwakkel G, Schepers L, et al. Physical activity and risk of lymphoma: a meta-analysis. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*. 2013;22(7):1173-84.
17. Chen Y, Yu C, Li Y. Physical activity and risks of esophageal and gastric cancers: a meta-analysis. *PloS one*. 2014;9(2):e88082.
18. Behrens G, Jochem C, Keimling M, Ricci C, Schmid D, Leitzmann MF. The association between physical activity and gastroesophageal cancer: systematic review and meta-analysis. *European journal of epidemiology*. 2014;29(3):151-70.

19. Singh S, Devanna S, Edakkanambeth Varayil J, Murad MH, Iyer PG. Physical activity is associated with reduced risk of esophageal cancer, particularly esophageal adenocarcinoma: A systematic review and meta-analysis. *BMC gastroenterology*. 2014;14(1).
20. Psaltopoulou T, Ntanasis-Stathopoulos I, Tzanninis I-G, Kantzanou M, Georgiadou D, Sergentanis TN. Physical Activity and Gastric Cancer Risk: A Systematic Review and Meta-Analysis. *Clinical Journal of Sport Medicine*. 2016;26(6):445-64.
21. Behrens G, Leitzmann MF. The association between physical activity and renal cancer: systematic review and meta-analysis. *British journal of cancer*. 2013;108(4):798-811.
22. Shephard RJ. Can habitual physical activity contribute to reducing the health burden of renal cancer? *IJASS(International Journal of Applied Sports Sciences)*. 2016;28(2):148-63.
23. Liu Y, Hu F, Li D, Wang F, Zhu L, Chen W, et al. Does physical activity reduce the risk of prostate cancer? A systematic review and meta-analysis. *European urology*. 2011;60(5):1029-44.
24. Benke IN, Leitzmann MF, Behrens G, Schmid D. Physical activity in relation to risk of prostate cancer: A systematic review and meta-analysis. *Annals of Oncology*. 2018;29(5):1154-79.
25. Shephard R. Physical Activity and Prostate Cancer: An Updated Review. *Sports Medicine*. 2017;47(6):1055-73.
26. Krstev S, Knutsson A. Occupational Risk Factors for Prostate Cancer: A Meta-analysis. *Journal of cancer prevention*. 2019;24(2):91-111.
27. O'Rorke MA, Cantwell MM, Cardwell CR, Mulholland HG, Murray LJ. Can physical activity modulate pancreatic cancer risk? A systematic review and meta-analysis. *International journal of cancer*. 2010;126(12):2957-68.
28. Bao Y, Michaud DS. Physical activity and pancreatic cancer risk: A systematic review. *Cancer Epidemiology Biomarkers and Prevention*. 2008;17(10):2671-82.
29. Keimling M, Behrens G, Schmid D, Jochem C, Leitzmann MF. The association between physical activity and bladder cancer: Systematic review and meta-analysis. *British journal of cancer*. 2014;110(7):1862-70.
30. Aune D, Norat T, Leitzmann M, Tonstad S, Vatten LJ. Physical activity and the risk of type 2 diabetes: A systematic review and dose-response meta-analysis. *European journal of epidemiology*. 2015;30(7):529-42.
31. McWilliams DF, Leeb BF, Muthuri SG, Doherty M, Zhang W. Occupational risk factors for osteoarthritis of the knee: A meta-analysis. *Osteoarthritis and cartilage*. 2011;19(7):829-39.
32. Gignac MAM, Irvin E, Cullen K, Van Eerd D, Beaton DE, Mahood Q, et al. Men and women's occupational activities and the risk of developing osteoarthritis of the knee, hip or hands: A systematic review and recommendations for future research. *Arthritis care & research*. 2019.
33. Palmer KT. Occupational activities and osteoarthritis of the knee. *British Medical Bulletin*. 2012;102(1):147-70.
34. White RL, Babic MJ, Parker PD, Lubans DR, Astell-Burt T, Lonsdale C. Domain-Specific Physical Activity and Mental Health: A Meta-analysis. *American journal of preventive medicine*. 2017;52(5):653-66.
35. Yang B, Wang Y, Cui F, Huang T, Sheng P, Shi T, et al. Association between insomnia and job stress: a meta-analysis. *Sleep & breathing = Schlaf & Atmung*. 2018;22(4):1221-31.
36. Huai P, Xun H, Reilly KH, Wang Y, Ma W, Xi B. Physical Activity and Risk of Hypertension A Meta-Analysis of Prospective Cohort Studies. *Hypertension*. 2013;62(6):1021-6.