

## APPENDIX A. DATA EXTRACTIONS OF INCLUDED EVIDENCE (IN ALPHABETICAL ORDER BY AUTHOR)

<b>SR/MA</b> <b>Citation:</b> Ahmad S, Shanmugasegaram S, Walker KL, Prince SA. Examining sedentary time as a risk factor for cardiometabolic diseases and their markers in South Asian adults: a systematic review. <i>Int J Public Health</i> . 2017 May;62(4):503-515	
<b>Purpose:</b> To systematically review the literature to determine whether sedentary time was associated with cardiometabolic diseases and their risk factors among South Asian adults.	<b>Abstract:</b> <b>OBJECTIVES:</b> The objective was to systematically review the literature to determine whether sedentary time was associated with cardiometabolic diseases and their risk factors among South Asian adults. <b>METHODS:</b> Six electronic databases were searched to identify all studies that examined the association between sedentary time and cardiometabolic diseases (e.g., diabetes, cardiovascular disease) and their risk factors [e.g., body mass index (BMI), waist circumference (WC), lipids, blood pressure (BP), glucose] among South Asian adults. Two independent reviewers performed abstract/full-text screening, data abstraction, and quality assessments.
<b>Timeframe:</b> N/A	<b>RESULTS:</b> Searching identified 1757 potential articles; 22 were used in the analysis. Greater sedentary time was associated with an increased likelihood of diabetes (n = 5), higher BMI (n = 13), WC (n = 3), BP (n = 2), and glucose (n = 4). Thirteen out of 22 studies were of higher quality.
<b>Total # studies included:</b> 22 (one prospective study on incident diabetes)	<b>CONCLUSION:</b> Results identified a trend whereby greater sedentary time was associated with an increased risk for diabetes, and several other cardiometabolic risk factors among South Asian adults. High quality studies are needed to identify whether risk factors are independent of physical activity levels to inform culturally-specific interventions for South Asians.
<b>Other details (e.g. definitions used, exclusions etc)</b> studies in South East Asian adults included. Results from one prospective study indicating 84% higher risk for developing diabetes in top vs bottom quartile for sedentary time. No dose-response and no meta-analysis	
<b>Outcomes addressed:</b> Type 2 diabetes and CVD risk factors	

<b>SR/MA</b>	
<b>Citation:</b> Bailey DP, Hewson DJ, Champion RB, Sayegh SM. Sitting time and risk of cardiovascular disease and diabetes: a systematic review and meta-analysis. American journal of preventive medicine. 2019 Aug 1.	
<b>Purpose: Sitting time and CVD and Diabetes</b>	<b>Abstract:</b> Context: Whether physical activity attenuates the association of total daily sitting time with cardiovascular disease and diabetes incidence is unclear. This systematic review and meta-analysis examined the association of total daily sitting time with cardiovascular disease and diabetes with and without adjustment for physical activity. Evidence acquisition: PubMed, Web of Science, BASE, MEDLINE, Academic Search Elite, and ScienceDirect were searched for prospective studies, published between January 1, 1989, and February 15, 2019, examining the association of total daily sitting time with cardiovascular disease or diabetes outcomes. Data extraction and study quality assessments were conducted by 2 independent reviewers. Pooled hazard ratios (HRs) were calculated using a fixed-effects model. The quality assessment and meta-analysis procedures were completed in 2018. Evidence synthesis: Nine studies with 448,285 participants were included. A higher total daily sitting time was associated with a significantly increased risk of cardiovascular disease (HR=1.29, 95% CI=1.27, 1.30, p<0.001) and diabetes (HR=1.13, 95% CI=1.04, 1.22, p<0.001) incidence when not adjusted for physical activity. The increased risk for diabetes was unaffected when adjusting for physical activity (HR=1.11, 95% CI=1.01, 1.19, p<0.001). For cardiovascular disease, the increased risk was attenuated but remained significant (HR=1.14, 95% CI=1.04, 1.23, p<0.001). Conclusions: Higher levels of total daily sitting time are associated with an increased risk of cardiovascular disease and diabetes, independent of physical activity. Reductions in total daily sitting may be recommended in public health guidelines.
<b>Timeframe: Jan 1989 to Feb 2019</b>	
<b>Total # studies included: 9</b>	
<b>Other details (e.g. definitions used, exclusions etc)</b>	
<b>Outcomes addressed: Incidence of CVD Incidence of Diabetes</b>	

<b>SR/MA</b>	
<b>Citation:</b> Berger FF, Leitzmann MF, Hillreiner A, Sedlmeier AM, Prokopidi-Danisch ME, Burger M, Jochem C. Sedentary Behaviour and Prostate Cancer: A Systematic Review and Meta-Analysis of Prospective Cohort Studies. <i>Cancer Prev Res (Phila)</i> . 2019 Oct;12(10):675-688. doi: 10.1158/1940-6207.CAPR-19-0271. Epub 2019 Jul 30. PMID: 31362941.	
<b>Purpose:</b> To examine sedentary behaviour and total, advanced, and fatal prostate cancer with particular attention paid to aggressive prostate cancer because obesity (a correlate of SB) is linked to advanced prostate cancer only.	<b>Abstract:</b> Prostate cancer is the second most common cancer in men worldwide, and sedentary behaviour is widespread, yet reviews and meta-analyses summarizing the role of sedentary behaviour as a potential risk factor for prostate cancer are scarce. We searched PubMed, Web of Science, and Cochrane databases for relevant articles up to January 2019. We pooled maximally adjusted risk estimates in a random effects model and performed meta-regression meta-analysis, assessed heterogeneity and publication bias using $I^2$ , funnel plots, Egger's and Begg's tests, and conducted sensitivity analyses and influence diagnostics. Data from 12 prospective cohort studies including a total of 30,810 prostate cancer cases were analyzed. We found no statistically significant association between high versus low sedentary behaviour and prostate cancer incidence (relative risk (RR)=1.07, 95% confidence interval (CI)=0.99-1.16, P=0.10). We noted that adjustment for body mass index (BMI) modified the relation of sedentary behaviour to prostate cancer, particularly aggressive cancer. Sedentary behaviour was related to a statistically significant increased risk of aggressive prostate cancer in analyses not adjusted for BMI (RR=1.21, 95% CI=1.03-1.43), whereas no association was apparent in BMI-adjusted analyses (RR=0.98, 95% CI=0.90-1.07), and the difference between those summary risk estimates was statistically significant (P(difference)=0.02). Sedentary behaviour is not independently associated with prostate cancer. However, prolonged sedentary behaviour may be related to increased risk of aggressive prostate cancer through a mechanism involving obesity. This finding represents a potentially important step towards considering sedentary behaviour as a modifiable behavioural risk factor for aggressive prostate cancer.
<b>Timeframe:</b> Inception to January 2019	
<b>Total # studies included:</b> 12	
<b>Other details (e.g. definitions used, exclusions etc)</b> Inclusion criteria included use of total daily sitting time or sedentary behaviours during occupation, leisure time, or transportation as exposure variables.	
<b>Outcomes addressed:</b> Incidence of total prostate cancer and aggressive prostate cancer (the latter includes prostate cancer mortality)	

<b>SR/MA</b>	
<b>Citation:</b> Chan DS, Abar L, Cariolou M, Nanu N, Greenwood DC, Bandera EV, McTiernan A, Norat T. World Cancer Research Fund International: Continuous Update Project—systematic literature review and meta-analysis of observational cohort studies on physical activity, sedentary behavior, adiposity, and weight change and breast cancer risk. <i>Cancer Causes &amp; Control</i> . 2019 Aug 30:1-8.	
<b>Purpose: Incidence of breast cancer</b>	<b>Abstract:</b> <b>Purpose</b> The purpose of the present study was to systematically review the complex associations between energy balance related factors and breast cancer risk, for which previous evidence has suggested different associations in the life course of women and by hormone receptor (HR) status of the tumour. <b>Methods</b> Relevant publications on adulthood physical activity, sedentary behaviour, body mass index (BMI), waist and hip circumferences, waist-to-hip ratio, and weight change and pre- and postmenopausal breast cancer risk were identified in PubMed up to 30 April 2017. Random-effects meta-analyses were conducted to summarize the relative risks across studies. <b>Results</b> One hundred and twenty-six observational cohort studies comprising over 22,900 premenopausal and 103,000 postmenopausal breast cancer cases were meta-analyzed. Higher physical activity was inversely associated with both pre- and postmenopausal breast cancers, whereas increased sitting time was positively associated with postmenopausal breast cancer. <b>Conclusion</b> Better understanding on the impact of these factors on pre- and postmenopausal breast cancers and their subtypes along the life course is needed.
<b>Timeframe: inception to Apr 2017</b>	
<b>Total # studies included: 126</b>	
<b>Other details (e.g. definitions used, exclusions etc) mixture of physical activity, sedentary, and diet studies</b>	
<b>Outcomes addressed: Incidence of breast cancer</b>	

<b>MA</b>	
<b>Citation:</b> Del Pozo-Cruz J, García-Hermoso A, Alfonso-Rosa RM, Alvarez-Barbosa F, Owen N, Chastin S, Del Pozo-Cruz B. Replacing Sedentary Time: Meta-analysis of Objective-Assessment Studies. Am J Prev Med. 2018 Sep;55(3):395-402. doi: 10.1016/j.amepre.2018.04.042. PMID: 30122216.	
<b>Purpose:</b> To examine replacing time spent sedentary with physical activity in relation to cardiometabolic risk markers and all-cause mortality using device-based measurement.	<b>Abstract:</b> Context: The aim was to summarize estimates of the potential benefits for cardiometabolic risk markers and all-cause mortality of replacing time spent in sedentary behaviours with light-intensity physical activity or with moderate to vigorous physical activity, from studies using device-based measurement. Evidence acquisition: Four databases covering the period up to December 2016 were searched and analyzed (February 2017). Data were extracted by two independent reviewers. For the meta- analyses, the estimated regression coefficients (b) and 95% CIs were analyzed for BMI, waist circumference, and high-density lipoprotein cholesterol. Pooled relative rate and 95% CIs were calculated for fasting glucose, fasting insulin, and homeostatic model assessment-insulin resistance values.
<b>Timeframe:</b> Inception to December 2016.	Hazard ratios were extracted from studies of all-cause mortality risk.
<b>Total # studies included:</b> 10	Evidence synthesis: Ten studies (with 17,390 participants) met the inclusion criteria. Reallocation of 30 minutes of sedentary time to light-intensity physical activity was associated with reductions in waist circumference, fasting insulin, and all-cause mortality risk; and with an increase in high-density lipoprotein cholesterol. Reallocating 30 minutes of sedentary time to moderate to vigorous physical activity was associated with reductions in BMI, waist circumference, fasting glucose, fasting insulin, and all-cause mortality (not pooled) and with an increase in high-density lipoprotein cholesterol. Conclusions: Replacing sedentary time with either light-intensity physical activity or moderate to vigorous physical activity may be beneficial, but when sedentary time is replaced with moderate to vigorous physical activity, the predicted impacts are stronger and apparent for a broader range of risk markers. These findings point to potential benefits of replacing sedentary time with light-intensity physical activity, which may benefit those less able to tolerate or accommodate higher-intensity activities, including many older adults.
<b>Other details (e.g. definitions used, exclusions etc)</b> Inclusion criteria: reported objective measure of activity and sedentary behaviour; used isotemporal models of the effects of replacing sedentary behaviour with LIPA or MVPA on at least one cardiometabolic factor or mortality.	
<b>Outcomes addressed:</b> BMI, waist circumference, fasting glucose, fasting insulin, high-density lipoprotein, and all-cause mortality.	

**SR/MA**

**Citation:** Ekelund U, Tarp J, Steene-Johannessen J, Hansen BH, Jefferis B, Fagerland MW, Whincup P, Diaz KM, Hooker SP, Chernofsky A, Larson MG. Dose-response associations between accelerometry measured physical activity and sedentary time and all cause mortality: systematic review and harmonised meta-analysis. *bmj*. 2019 Aug 21;366:l4570. <https://doi.org/10.1136/bmj.l4570>

**Purpose:** to examine the association between accelerometer measured physical activity and sedentary time and all-cause mortality.

**Abstract:**

**Objective:** To examine the dose-response associations between accelerometer assessed total physical activity, different intensities of physical activity, and sedentary time and all cause mortality.

**Design:** Systematic review and harmonised meta-analysis.

**Data sources:** PubMed, PsycINFO, Embase, Web of Science, Sport Discus from inception to 31 July 2018.

**Eligibility criteria:** Prospective cohort studies assessing physical activity and sedentary time by accelerometry and associations with all cause mortality and reported effect estimates as hazard ratios, odds ratios, or relative risks with 95% confidence intervals.

**Data extraction and analysis** Guidelines for meta-analyses and systematic reviews for observational studies and PRISMA guidelines were followed. Two authors independently screened the titles and abstracts. One author performed a full text review and another extracted the data. Two authors independently assessed the risk of bias. Individual level participant data were harmonised and analysed at study level. Data on physical activity were categorised by quarters at study level, and study specific associations with all cause mortality were analysed using Cox proportional hazards regression analyses. Study specific results were summarised using random effects meta-analysis.

**Main outcome measure:** All-cause mortality.

**Results:** 39 studies were retrieved for full text review; 10 were eligible for inclusion, three were excluded owing to harmonisation challenges (e.g., wrist placement of the accelerometer), and one study did not participate. Two additional studies with unpublished mortality data were also included. Thus, individual level data from eight studies (n=36 383; mean age 62.6 years; 72.8% women), with median follow-up of 5.8 years (range 3.0-14.5 years) and 2149 (5.9%) deaths were analysed. Any physical activity, regardless of intensity, was associated with lower risk of mortality, with a non-linear dose-response. Hazards ratios for mortality were 1.00 (referent) in the first quarter (least active), 0.48 (95% confidence interval 0.43 to 0.54) in the second quarter, 0.34 (0.26 to 0.45) in the third quarter, and 0.27 (0.23 to 0.32) in the fourth quarter (most active). Corresponding hazards ratios for light physical activity were 1.00, 0.60 (0.54 to 0.68), 0.44 (0.38 to 0.51), and 0.38 (0.28 to 0.51), and for moderate-to-vigorous physical activity were 1.00, 0.64 (0.55 to 0.74), 0.55 (0.40 to 0.74), and 0.52 (0.43 to 0.61). For sedentary time, hazards ratios were 1.00 (referent; least sedentary), 1.28 (1.09 to 1.51), 1.71 (1.36 to 2.15), and 2.63 (1.94 to 3.56).

**Conclusion**

Higher levels of total physical activity, at any intensity, and less time spent sedentary, are associated with substantially reduced risk for premature mortality, with evidence of a non-linear dose-response pattern in middle aged and older adults.

<b>SR/MA</b>	
<b>Citation:</b> Ekelund U, Brown WJ, Steene-Johannessen J, Fagerland MW, Owen N, Powell KE, Bauman AE, Lee IM. Do the associations of sedentary behaviour with cardiovascular disease mortality and cancer mortality differ by physical activity level? A systematic review and harmonised meta-analysis of data from 850 060 participants. <i>British Journal of Sports Medicine</i> . 2019 Jul 1;53(14):886-94. <a href="https://doi.org/10.1136/bjsports-2017-098963">https://doi.org/10.1136/bjsports-2017-098963</a>	
<b>Purpose:</b> to examine whether these modifying effects of physical activity exist for relationships between sitting and cause-specific mortality	<b>Abstract:</b> Objective To examine whether the associations between sedentary behaviours (i.e., daily sitting/TV viewing time) and mortality from cardiovascular disease (CVD) and cancer differ by different levels of physical activity (PA). Design Harmonised meta-analysis of prospective cohort studies. Data on exposure variables were harmonised according to a predefined protocol and categorised into four groups for sedentary behaviours and into quartiles of PA (MET-hour/week).
<b>Timeframe:</b> inception to 10 Nov 2014	Data sources PubMed, PsycINFO, Embase, Web of Science, Sport Discus and Scopus.
<b>Total # studies included:</b> 14 prospective cohort studies	Eligibility criteria for selecting studies Individual level data on both sedentary behaviours and PA and reported effect estimates for CVD or cancer mortality.
<b>Other details (e.g. definitions used, exclusions etc)</b> In the end, only subjective measures were included. Sitting exposures distinguished sitting time or TV time.	Results Nine studies (n=850 060; deaths=25 730) and eight studies (n=777 696; deaths=30 851) provided data on sitting time and CVD and cancer mortality, respectively. Five studies had data on TV-viewing time and CVD (n=458 127; deaths=13 230) and cancer (n=458 091; deaths=16 430) mortality. A dose-response association between sitting time (9%–32% higher risk; p for trend <0.001) and TV time (3%–59% higher risk; p for trend <0.001) with CVD mortality was observed in the 'inactive', lowest quartile of PA. Associations were less consistent in the second and third quartiles of PA, and there was no increased risk for CVD mortality with increasing sedentary behaviours in the most active quartile. Associations between sedentary behaviours and cancer mortality were generally weaker; 6%–21% higher risk with longer sitting time observed only in the lowest quartile of PA.
<b>Outcomes addressed:</b> CVD mortality, cancer mortality	Conclusion PA modifies the associations between sedentary behaviours and CVD and cancer mortality. These findings emphasise the importance of higher volumes of moderate and vigorous activity to reduce, or even eliminate these risks, especially for those who sit a lot in their daily lives.

<b>SR/MA</b>	
<b>Citation:</b> Ku PW, Steptoe A, Liao Y, Hsueh MC, Chen LJ. A cut-off of daily sedentary time and all-cause mortality in adults: a meta-regression analysis involving more than 1 million participants. <i>BMC medicine</i> . 2018 Dec;16(1):74. <a href="https://doi.org/10.1186/s12916-018-1062-2">https://doi.org/10.1186/s12916-018-1062-2</a>	
<b>Purpose:</b> to explore the cut-off duration associated with elevating the risk of all-cause mortality.	<b>Abstract:</b> Background: The appropriate limit to the amount of daily sedentary time (ST) required to minimize mortality is uncertain. This meta-analysis aimed to quantify the dose-response association between daily ST and all-cause mortality and to explore the cut-off point above which health is impaired in adults aged 18–64 years old. We also examined whether there are differences between studies using self-report ST and those with device-based ST. Methods: Prospective cohort studies providing effect estimates of daily ST (exposure) on all-cause mortality (outcome) were identified via MEDLINE, PubMed, Scopus, Web of Science, and Google Scholar databases until January 2018. Dose-response relationships between daily ST and all-cause mortality were examined using random-effects meta-regression models. Results: Based on the pooled data for more than 1 million participants from 19 studies, the results showed a log-linear dose-response association between daily ST and all-cause mortality. Overall, more time spent in sedentary behaviours is associated with increased mortality risks. However, the method of measuring ST moderated the association between daily ST and mortality risk ( $p < 0.05$ ). The cut-off of daily ST in studies with self-report ST was 7 h/day in comparison with 9 h/day for those with device-based ST. Conclusions: Higher amounts of daily ST are log-linearly associated with increased risk of all-cause mortality in adults. On the basis of a limited number of studies using device-based measures, the findings suggest that it may be appropriate to encourage adults to engage in less sedentary behaviours, with fewer than 9 h a day being relevant for all-cause mortality
<b>Timeframe:</b> inception to 31 Jan 2018	
<b>Total # studies included: 19 cohort studies</b>	
<b>Other details (e.g. definitions used, exclusions etc) included only with PA adjustment.</b>	
<b>Outcomes addressed:</b> all-cause mortality	



<b>SR/MA</b>	
<b>Citation:</b> Ku PW, Steptoe A, Liao Y, Hsueh MC, Chen LJ. A Threshold of Objectively-Assessed Daily Sedentary Time for All-Cause Mortality in Older Adults: A Meta-Regression of Prospective Cohort Studies. Journal of clinical medicine. 2019 Apr;8(4):564. <a href="https://doi.org/10.3390/jcm8040564">https://doi.org/10.3390/jcm8040564</a>	
<b>Purpose:</b> to explore the dose-response relationship between daily ST and all-cause mortality in older adults.	<b>Abstract:</b> Background: This meta-analysis aimed to estimate the shape of the dose-response association between objectively-assessed daily sedentary time (ST) and all-cause mortality, and to explore whether there is a threshold of ST above which there is an increase in mortality risk in older adults.
<b>Timeframe:</b> inception to 31 March 2019	<b>Methods:</b> Searches for prospective cohort studies providing effect estimates of daily ST (exposure) on all-cause mortality (outcome) were undertaken in five databases up to 31 March 2019. A random-effects meta-regression model was conducted to quantify the dose-response relationship between daily ST and all-cause mortality. Sensitivity analyses were also performed to test the stability of the results.
<b>Total # studies included:</b> 11 cohort studies	<b>Results:</b> Our analysis of pooled data from 11 eligible studies did not reveal a consistent shape of association between ST and mortality. After excluding three studies with potential confounding bias, there was a log-linear dose-response relationship between daily ST and all-cause mortality. Overall, higher amounts of time spent in sedentary behaviours were associated with elevated mortality risks in older adults. Visual assessments of dose-response relationships based on meta-regression analyses indicated that increased mortality risks became significant when total ST exceeded approximately 9 h/day.
<b>Other details</b> (e.g. definitions used, exclusions etc) healthy aged 65 or above; included only with device-based measures.	<b>Conclusions:</b> Based on a limited number of studies, this meta-analysis provides a starting point for considering a cut-off daily sedentary time, suggesting older adults spend less time in daily sitting.
<b>Outcomes addressed:</b> all-cause mortality	

<b>SR/MA</b>	
<b>Citation:</b> S. Mahmood; R. J. Maclnnis; D. R. English; A. Karahalios; B. M. Lynch. Domain-specific physical activity and sedentary behaviour in relation to colon and rectal cancer risk: a systematic review and meta-analysis. <i>Int J Epidemiol.</i> 2017 Dec 1;46(6):1797-1813.	
<b>Purpose:</b> to examine the associations between physical activity, sedentary behaviour and the risk of colon and rectal cancers separately for occupational, recreational, transport and household domains	<b>Abstract:</b> Background: Physical activity is associated with reduced risk of colorectal cancer, but most epidemiological studies have focused on occupational and recreational physical activity. The evidence for other domains of activity, and for sedentary behaviour, is limited. Methods: Medline, Embase and Web of Science were searched from inception to December 2015 for studies examining domain-specific physical activity or sedentary behaviour and the risk of colon and/or rectal cancer. We extracted maximally adjusted relative risks (RRs) except when RRs not adjusted for body mass index, were also presented. We used random-effects meta-analysis to compute pooled RRs comparing the highest versus the lowest level of exposure. We used meta-regression to assess sources of heterogeneity in estimates. Results: We identified 17 cohort and 21 case-control studies, of which 17 had occupational data, 23 had recreational data, three each had data on transport and household physical activity domains, and 6 studies had data on occupational sedentary behaviour. The pooled relative risks (RRs) for colon cancer were 0.74 (95% confidence interval (CI): 0.67, 0.82) for occupational activity, 0.80 (95% CI: 0.71, 0.89) for recreational activity, 0.66 (95% CI: 0.45, 0.98) for transport-related physical activity, 0.85 (95% CI: 0.71, 1.02) for household physical activity, and 1.44 (95% CI: 1.28, 1.62) for occupational sedentary behaviour. For rectal cancer, the pooled RRs were 0.88 (95% CI: 0.79, 0.98) for occupational activity, 0.87 (95% CI: 0.75, 1.01) for recreational activity, 0.88 (95% CI: 0.70, 1.12) for transport-related physical activity, 1.01 (95% CI: 0.80, 1.27) for household physical activity, and 1.02 (95% CI: 0.82, 1.28) for occupational sedentary behaviour. Conclusions: In addition to increasing occupational and recreational physical activity, promoting physical activity during transport and reducing sedentary behaviour in the workplace may also be useful colorectal cancer prevention strategies.
<b>Timeframe:</b> Inception to 31 December 2015	
<b>Total # studies included:</b> 38 (6 studies on occupational sedentary behaviours)	
<b>Other details (e.g. definitions used, exclusions etc)</b> Cohort and case-control studies included that specifically examined domain specific behaviours; Six studies of interest for sedentary behaviour; data reported as comparing the highest vs lowest category. No dose-response	
<b>Outcomes addressed:</b> Colorectal cancer	

<b>SR &amp; MA</b>	
<b>Citation:</b> Patterson R, McNamara E, Tainio M, de Sá TH, Smith AD, Sharp SJ, Edwards P, Woodcock J, Brage S, Wijndaele K. Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: a systematic review and dose response meta-analysis. <i>Eur J Epidemiol.</i> 2018 Sep;33(9):811-829. doi: 10.1007/s10654-018-0380-1. Epub 2018 Mar 28. PMID: 29589226.	
<b>Purpose:</b> To examine the relation of sedentary behaviour to all-cause mortality, cardiovascular disease mortality and cancer mortality, and incident type 2 diabetes	<b>Abstract:</b> Purpose: To estimate the strength and shape of the dose–response relationship between sedentary behaviour and all-cause, cardiovascular disease (CVD) and cancer mortality, and incident type 2 diabetes (T2D), adjusted for physical activity (PA). Data Sources: Pubmed, Web of Knowledge, Medline, Embase, Cochrane Library and Google Scholar (through September-2016); reference lists. Study Selection: Prospective studies reporting associations between total daily sedentary time or TV viewing time, and C one outcome of interest. Data Extraction: Two independent reviewers extracted data, study quality was assessed; corresponding authors were approached where needed. Data Synthesis: Thirty-four studies (1,331,468 unique participants; good study quality) covering 8 exposure-outcome combinations were included. For total sedentary behaviour, the PA-adjusted relationship was non-linear for all-cause mortality (RR per 1 h/day: were 1.01 (1.00–1.01) B 8 h/day; 1.04 (1.03–1.05)[8 h/day of exposure), and for CVD mortality (1.01 (0.99–1.02) B 6 h/day; 1.04 (1.03–1.04)[6 h/day). The association was linear (1.01 (1.00–1.01)) with T2D and non-significant with cancer mortality. Stronger PA-adjusted associations were found for TV viewing (h/day); non-linear for all-cause mortality (1.03 (1.01–1.04) B 3.5 h/day; 1.06 (1.05–1.08)[3.5 h/day) and for CVD mortality (1.02 (0.99–1.04) B 4 h/day; 1.08 (1.05–1.12)[4 h/day). Associations with cancer mortality (1.03 (1.02–1.04)) and T2D were linear (1.09 (1.07–1.12)). Conclusions: Independent of PA, total sitting and TV viewing time are associated with greater risk for several major chronic disease outcomes. For all-cause and CVD mortality, a threshold of 6–8 h/day of total sitting and 3–4 h/day of TV viewing was identified, above which the risk is increased.
<b>Timeframe:</b> Inception to September 2016	
<b>Total # studies included:</b> 34	
<b>Other details (e.g. definitions used, exclusions etc)</b> Analyses of dose–response associations and for different types of sedentary behaviour. Also, dose–response curves with and without adjustment for PA were compared. In addition, PAFs were calculated.	
<b>Outcomes addressed:</b> All-cause mortality, cardiovascular disease mortality, cancer mortality, and type 2 diabetes incidence.	

<b>SR/MA</b> <b>Citation:</b> J. Wang; L. Huang; Y. Gao; Y. Wang; S. Chen; J. Huang; W. Zheng; P. Bao; Y. Gong; Y. Zhang; M. Wang; M. C. S. Wong. Physically active individuals have a 23% lower risk of any colorectal neoplasia and a 27% lower risk of advanced colorectal neoplasia than their non-active counterparts: systematic review and meta-analysis of observational studies. Br J Sports Med Epub ahead of print: [please include Day Month Year]. doi:10.1136/bjsports-2018-100350	
<b>Purpose:</b> Examine the associations between physical activity (PA), sedentary behaviour (SB) and risk of colorectal neoplasia (CN).	<b>Abstract:</b> BACKGROUND: Few studies have examined the associations between physical activity (PA), sedentary behaviour (SB) and risk of colorectal neoplasia (CN). METHODS: We systematically searched Medline, Embase, PsylInfo, Cochrane and other sources from their inception to 30 September 2018 for cohort, case-control and cross-sectional studies that evaluated these associations in asymptomatic, average-risk subjects. Random-effect models were used to estimate relative risks (RRs) of any-type CN, advanced CN, and non-advanced CN, respectively, in individuals with the highest versus the lowest level of PA and SB. Dose-response analyses and subgroup analyses were conducted. The I(2) statistic was used to examine heterogeneity among studies. RESULTS: We identified 32 observational studies, including 17 cross-sectional studies, 10 case-control studies and five longitudinal studies. PA (highest vs lowest) was inversely associated with risk for any-type CN (n=23 studies) and advanced CN (n=15 studies), with a RR of 0.77 (95% CI=0.71 to 0.83, I(2)=57.5%) and 0.73 (95% CI=0.63 to 0.82, I(2)=45.5%), respectively. There was no association between PA and non-advanced CN (n=5 studies). There was an association between PA and any-type CN in both sexes, and also for the distal colon. We found no dose-response relationship between PA and any-type or advanced CN. Based on three studies identified, SB time (longest vs shortest) was associated with an increased risk of advanced CN (RR=1.24, 95% CI 1.04 to 1.49, I(2)=14.4%). No publication bias was detected by Begg's test. CONCLUSION: We report a 23% lower relative risk of any type of CN and a 27% lower risk of advanced CN in people with the highest level of PA compared with those in the lowest.
<b>Timeframe:</b> Inception to 30 September 2018	
<b>Total # studies included:</b> 32 including 17 cross-sectional studies, 10 case-control studies and five longitudinal studies (3 studies on sedentary)	
<b>Other details (e.g. definitions used, exclusions etc)</b> Three studies reported data on sedentary behaviours and colorectal neoplasia (potential for overlap between two of these studies derived from the same cohort). meta-analysis of three studies. Comparator unclear and no dose-response reported	
<b>Outcomes addressed:</b> colorectal neoplasia	

<b>Harmonized MA</b>	
<b>Citation:</b> Xu C, Furuya-Kanamori L, Liu Y, Færch K, Aadahl M, A Seguin R, LaCroix A, Basterra-Gortari FJ, Dunstan DW, Owen N, Doi SAR. Sedentary Behavior, Physical Activity, and All-Cause Mortality: Dose-Response and Intensity Weighted Time-Use Meta-analysis. J Am Med Dir Assoc. 2019 Oct;20(10):1206-1212.e3. doi: 10.1016/j.jamda.2019.05.001. Epub 2019 Jul 2. PMID: 31272857.	
<b>Purpose:</b> To examine whether sedentary behaviour-related mortality risk can be offset by MVPA considered in a time-use fashion.	<b>Abstract:</b> Objectives: Previous studies have placed those with excessive sedentary behavior at increased risk of all-cause mortality. There is evidence of interdependency of sedentary behaviour with physical activity, and its elucidation will have implications for guidelines and practice. This study investigated if sedentary behaviour-related mortality risk can be offset by moderate- to vigorous-intensity physical activity (MVPA) considered in a time-use fashion. Design: PubMed was searched (from its inception till May 2018) for studies or meta-analyses that used data harmonized for MVPA. Of the 17 data-custodians located, 7 provided data on sitting time or TV viewing time, or both. A dose-response meta-analysis modelling log relative risks of all-cause mortality against uncompensated sedentary behaviour metabolic equivalent hours (USMh) was run using the robust error meta-regression method. (Registration: CRD42017062439) Setting: Individual subject data held by data custodians on this topic. Participants: General adults. Measurements: Sedentary time, MVPA. Results: Five harmonized cohorts of sitting time (258,688 participants) and 4 of TV viewing time (156,593 participants) demonstrated that sedentary behaviour was significantly associated with mortality, but this risk was attenuated with increasing energy expenditure through MVPA modelled in a time-use fashion. The average increment in mortality per USMh spent on sitting was 1% [relative risk (RR) 1.01, 95% confidence interval (CI) 1.00, 1.02; P=.01] and that per USMh spent on TV viewing was 7% (RR 1.07, 95% CI 1.04, 1.10; P < .001). The thresholds for risk started at 7 USMh for sitting and 3 USMh for TV viewing. Conclusions/Implications: Our findings suggest that overall daily sitting time energy expenditure of 7 MET-hours (or TV viewing of 3 MET-hours) in excess of that expended on MVPA is independently related to all-cause mortality. These findings support the view that sitting is strongly influenced by consideration of concurrent MVPA in its impact on adverse health consequences and that the USMh is a more practical metric of sedentary behaviour.
<b>Timeframe:</b> Inception to May 2018	
<b>Total # studies included:</b> 9	
<b>Other details (e.g. definitions used, exclusions etc)</b> Use of harmonized data from the authors of the cohort studies included in the 2016 Lancet meta-analysis by Ekelund et al.	
<b>Outcomes addressed:</b> Total mortality	