

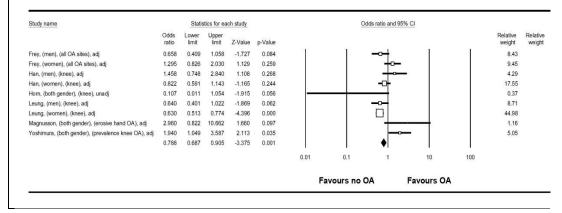
Supplementary Figure 1. Funnel plots for main meta-analysis

A. Funnel plot for model 1, risk of diabetes mellitus comparing subjects with to without osteoarthritis. **B.** Funnel plot for model 2, risk of osteoarthritis comparing subjects with to without diabetes mellitus. White: observed studies; Black: imputed studies adjusted for publication bias.

A. All Studies with BMI adjustment in statistical models. Odds ratio and 95% CI Study name Statistics for each study Odds ratio Lower limit Upper limit Relative weight Relative weight Z-Value p-Value Al-Jarallah, (both gender), (knee), adj 0.098 0.042 -5.355 0.000 0.55 0.229 Bagge, (men), (knee), adj Bagge, (women), (knee), adj Dahaghin, (both), (hand), adj 1.080 0.511 2.284 0.201 0.840 0.71 1.440 0.611 3.394 0.834 0.405 0.55 Davies-Tuck, (men), (prevalence BML), adj 2.670 0.119 60.119 0.618 0.537 0.04 Davies-Tuck, (women), (prevalence BML), adj 3.590 0.741 17.388 1.588 0.112 0.857 0.409 0.826 2.288 1.058 2.030 1.67 1.77 1.98 Engstrom, (both gender), (knee), adj Frey, (men), (all QA sites), adj 1.400 1.345 0.179 0.658 -1.727 0.084 Frey, (women), (all OA sites), adj 0.748 0.591 1.133 0.401 0.513 Han, (men), (knee), adj 1,458 2.840 1.108 0.268 0.90 Han, (women), (knee), adj Hart, (women), (knee), adj Leung, (men), (knee), adj 0.822 2.770 0.640 1.143 6.775 1.022 -1.165 2.233 -1.869 0.244 0.026 0.062 3.68 0.50 1.83 Leung, (women), (k nee), adj 0.630 0.774 -4.398 0.000 9.45 0.822 0.349 0.140 0.880 0.24 0.71 0.21 Magnusson, (both gender), (erosive hand OA), adj Martin, (men), (knee), adj 10.662 2,960 1 660 0.097 0.740 -0.786 0.432 Martin, (women), (knee), adj 0.560 2.240 -0.820 0.412 Monira Hussain, (both gender), (knee), adj 1.070 0.680 10.53 Nielen, (both gender), (knee), adj Nieves-Plaza, (both gender), (knad and knee), adj Reid, (men 33-44 yrs), (all OA sites), adj 0.769 1.120 0.660 0.621 0.850 0.939 -3.193 0.001 40.28 4.242 2.801 1.742 1.019 2.180 1.360 2.295 0.834 0.022 0.90 Reid, (men 45-54 yrs), (all OA sites), adj 1.040 0.149 0.882 1.51 Reid, (men 55-64 yrs), (all CA sites), adj Reid, (men 55-64 yrs), (all CA sites), adj Reid, (men 85+ yrs), (all CA sites), adj Reid, (women 35-44 yrs), (all CA sites), adj Reid, (women 45-54 yrs), (all CA sites), adj 0.600 0.353 0.998 1.061 1.087 1.43 1.66 1.18 2.52 -1.889 0.059 2.663 0.051 1.950 2.159 1.620 2.414 2.371 0.018 Reid, (women 55-64 yrs), (all OA sites), adj 1.310 Reid, (women 65-yrs), (all OA sites), adj 1.250 Schett, (both gender), (knee and hip), adj 2.090 Siverio, (both gender, schooling <5 yrs), (shoulder), adj 1.140 0.866 1.981 1.279 0.201 234 0.803 1.097 0.632 1.947 3.980 2.058 0.987 2.243 0.435 0.323 0.025 0.663 2.04 0.97 1.15 Siverio, (both gender, schooling >5 yrs), (shoulder), adj 2.890 1.366 6.113 1.871 2.778 0.005 0.71 Sturmer, (both gender), (generalized OA), adj Wang, (both gender) (knee), adj 0.970 -0.091 0.928 0.93 0.503 0.552 9.150 Yoshimura, (both gender), (prevalence knee OA), adj 1.06 1.940 1.049 3.587 2.113 0.035 0.961 0.903 1.024 -1.216 0.224 0.0 Favours no OA **Favours OA**

Supplementary Figure 2. Forest plots for risk of OA comparing DM to non-DM, sensitivity analysis stratified by BMI compatibility

B. Studies with comparable baseline BMI between subjects with or without DM



Study name Statistics for each study Odds ratio and 95% CI Odds ratio Relative weight Relative weight Upper limit Lower limit Z-Value p-Value Davies-Tuck, men (prevalence BML), adj 2.670 0.119 60.119 0.618 0.537 0.84 Davies-Tuck, women (prevalence BML), adj 3.590 0.741 17.388 1.588 0.112 2 84 Engstrom, (knee), adj 1.400 0.857 2.286 1.345 0.179 11.34 Frey, age adj only, men (all OA sites) 0.706 0.441 1.132 -1.446 0.148 11.62 Frey, age adj only, women (all OA sites) 1.102 0.707 1.718 0.430 0.667 12.03 Leung, men (knee), adj 0.640 0.401 1.022 -1.869 0.062 11.67 0.513 0.774 Leung, women (knee), adj 0.630 -4.396 0.000 15.38 Monira Hussain, (knee), adj 1.070 0.880 1.301 0.680 0.497 15.50 Schett, (knee and hip), adj 2.090 1.097 3.980 2.243 0.025 9.20 3.587 2.113 0.035 Yoshimura, (prevalence knee OA), adj 1.940 1.049 9.59 1.075 0.803 1.440 0.488 0.626 0.01 0.1 10 100 Favours no OA Favours OA **B.** Case control studies Study name Statistics for each study Odds ratio and 95% CI Odds ratio Lower limit Upper limit Relative weight Relative weight p-Value Z-Value Al-Jarallah, (knee), adj 0.098 0.042 0.229 -5.355 0.000 13.63 Han, men (knee), adj 1.458 0.748 2.840 1.108 0.268 15.87 Han, women (knee), adj 0.822 0.591 1.143 -1.165 0.244 19.81 Horn, (knee), unadj 0.107 0.011 1.054 -1.915 0.056 4.15 Magnusson, (erosive hand OA), adi 2.960 0.822 10.662 1.660 0.097 9.29 21.37 0.850 0.769 0.939 -3,193 0.001 Nielen, (knee), adj Nieves-Plaza, (hand and knee), adj 2.180 1.120 4.242 0.022 15.89 2.295 0.820 0.489 1.377 -0.750 0.453 0.01 0.1 10 100 Favours no OA Favours OA C. Cross-sectional studies Statistics for each study Odds ratio and 95% Cl Study name Odds ratio Lower limit Upper limit Relative weight Relative weight Z-Value p-Value Anderson (men) (knee) unadi 2 140 0.922 4 969 1770 0.077 3.01 2.140 1.020 1.080 1.440 0.520 0.511 0.611 2.000 2.284 3.394 0.058 0.201 0.834 0.954 0.840 0.405 4.30 3.64 2.92 11.45 Anderson, (women), (knee), Bagge, (men), (knee), adj Bagge, (women), (knee), adj Dahaghin, (both), (hand), adj 0.900 1.133 0.349 1.200 1.600 1.242 0.214 Hart, (women), (knee), adj 2.770 6.775 2.233 0.026 2.72 Hart, (women), (knee), adj Martin, (women), (knee), adj Martin, (women), (knee), adj Reid, (men 33-44 yrs), (all OA sites), adj Reid, (men 45-54 yrs), (all OA sites), adj Reid, (men 55-64 yrs), (all OA sites), adj 3.63 1.24 3.86 6.28 0 740 -0 786 0 432 0.740 0.560 1.360 1.040 0.349 0.140 0.660 0.621 2.240 0.432 0.412 0.404 0.882 -0.820 0.834 1.742 0.149 0.600 0.353 1.019 -1.889 0.059 6.07 Reid, (mon 63 -4 yrs), (all OA sites), adj Reid, (women 35-44 yrs), (all OA sites), adj Reid, (women 45-54 yrs), (all OA sites), adj Reid, (women 55-64 yrs), (all OA sites), adj 1.630 1.900 1.620 1.310 0.998 1.061 1.087 0.866 2 663 1 950 0.051 670 2.663 3.403 2.414 1.981 2.159 2.371 1.279 0.031 0.018 0.201 5.32 8.53 8.20 Reid, (women 65+ yrs), (all OA sites), adj 1.250 0.803 1.947 0.987 0.323 7.59 0.632 1.366 0.503 0.552 Siverio, (both gender, schooling <5 yrs), (shoulder), ad 1.140 2 056 0 4 3 5 0.663 5 23 Siverio, (both gender, schooling <5 yrs), (shoulder), ad Siverio, (both gender, schooling >5 yrs), (shoulder), ad Sturmer, (both gender), (generalized OA), adj Wang, (both gender) (knee), adj 2.056 6.113 1.871 9.150 0.435 2.776 -0.091 1.130 3.090 5.23 3.64 4.47 1.21 2.890 0.005 0.970 0.928 1.287 1.097 1.510 0.002 0.01 100 Favours OA Favours no OA

Supplementary Figure 3. Forest plots for risk of OA comparing DM to non-DM, sensitivity analysis stratified by study design

A. Prospective cohort studies

A. Men

Study name Statistics for each study Odds ratio and 95% CI Odds ratio Relative weight Lower limit Upper limit Relative weight Z-Value p-Value Anderson, (men), (knee), unadj 2.140 0.922 4.969 1770 0.077 6.79 Bagge, (men), (knee), adj Davies-Tuck, (men), (prevalence BML), adj 0.840 7.88 1.080 0.511 2.284 0.201 0.119 2.670 60.119 0.618 Frey, (men), (all OA sites), adj Han, (men), (knee), adj Leung, (men), (knee), adj Martin, (men), (knee), adj 12.29 0.658 0.409 1.058 -1.727 0.084 1.458 0.640 0.748 0.401 2.840 1.022 1.108 0.268 9.00 12.44 7.86 0.740 0.349 1.567 -0.786 0.432 Reid, (men 33-44 yrs), (all OA sites), adj Reid, (men 45-54 yrs), (all OA sites), adj 1.360 1.040 0.660 2.801 1.742 0.834 0.149 0.404 8.22 11.52 Reid, (men 55-64 yrs), (all OA sites), adj Reid, (men 65+ yrs), (all OA sites), adj 0.600 0.353 1.019 -1.889 0.059 11.26 1.630 0.999 0.998 2.663 1.310 1.950 0.051 11.99 0.994 0.01 0.1 10 100 Favours OA Favours no OA B. Women Odds ratio and 95% CI Study name Statistics for each study Odds ratio Lower limit Upper limit Relative weight Relative weight Z-Value p-Value 1.020 0.520 2.000 0.058 0.954 7.85 Anderson, (women), (knee), unadj Bagge, (women), (knee), adj Davies-Tuck, (women), (incidence BML), adj Frey, (women), (all OA sites), adj 1.440 0.611 3.394 0.834 0.405 6.28 5.760 1.295 1.062 0.826 2.029 1.129 31,255 0.042 2.49 2.030 0.259 10.13 Han, (women), (knee), adi 0.822 0.591 1.143 -1.165 0.244 11.35 Hart, (women), (knee), adj Leung, (women), (knee), adj 2.770 0.630 1.133 0.513 6.775 0.774 2.233 -4.396 0.026 6.00 12.41 0.000 Martin, (women), (knee), adi 0.560 0.140 2.240 -0.820 0.412 3.40 Reid, (women 35-44 yrs), (all OA sites), adj Reid, (women 45-54 yrs), (all OA sites), adj 1.061 1.087 3.403 2.414 2.159 2.371 0.031 1.900 8.74 1.620 10.66 Reid, (women 55-64 yrs), (all OA sites), adj 1.310 0.866 1.981 1.279 0.201 10.50 1.250 1.240 0.803 0.921 1.947 1.667 0.987 1.420 0.323 0.156 Reid, (women 65+ yrs), (all OA sites), adj 10.20 0.01 0.1 10 100

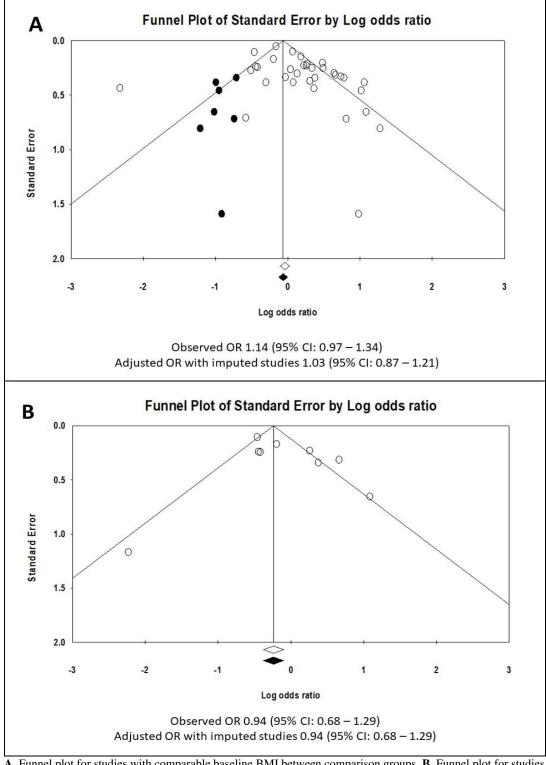
Favours no OA

Favours OA

Supplementary Figure 4. Forest plots for risk of OA comparing DM to non-DM, sensitivity analysis stratified by genders

A. Hand OA Study name Statistics for each study Odds ratio and 95% CI Relative Relative Odds Lower limit Upper limit Z-Value p-Value ratio weight weight Dahaghin, (both), (hand), adj 1.200 0.900 1.600 1.242 0.214 31.00 0.539 0.310 0.937 -2.189 0.029 24.05 Frey, (men), (hand), adj Frey, (women), (hand), adj 1.641 1.052 2.560 2.182 0.029 26.98 Magnusson, (both gender), (erosive hand OA), adj 2.960 0.822 10.662 1.660 0.097 10.27 0.572 12.839 1.257 7.70 Wang, (both gender), (hand), adj 2.711 0.209 0.771 2.053 1.258 0.920 0.357 0.01 0.1 100 10 Favours no OA Favours OA B. Hip OA Odds ratio and 95% CI Study name Statistics for each study Odds Lower Upper Relative Relative ratio limit limit Z-Value p-Value weight weight 0.404 -1.273 0.203 9.97 Engstrom, (both gender), (hip), adj 0.700 1.212 Frey, (men), (hip), adj 0.413 0.183 0.931 -2.131 0.033 5.16 1.038 Frey, (women), (hip), adj 0.627 1.718 0.144 0.886 11.38 Monira Hussain, (both gender), (hip), adj 1,100 0.882 1.372 0.844 0.399 29.15 Nielen, (both gender), (hip), adj 0.870 0.817 0.927 -4.337 0.000 44.34 0.895 0.736 1.088 -1.111 0.267 0.01 0.1 10 100 Favours no OA **Favours OA** C. Knee OA Odds ratio and 95% CI Statistics for each study Study name Relative weight Odds ratio Lower limit Upper limit Relative weight Z-Value p-Value Al-Jarallah, (both gender), (knee), adj 0.098 0.042 0.229 -5.355 0.000 3.58 0.077 Anderson, (men), (knee), unadj 2.140 0.922 4,969 1.770 3.63 Anderson, (women), (knee), unadj Bagge, (men), (knee), adj 1.020 1.080 2.000 2.284 4.75 4.21 0.520 0.058 0.954 0.511 0.201 0.840 Bagge, (women), (knee), adj 1.440 0.611 3.394 0.834 0.405 3.54 Davies-Tuck, (men), (prevalence BML), adj Davies-Tuck, (women), (prevalence BML), adj 2.670 3.590 0.119 60.119 17.388 0.618 0.39 0.537 0.112 Engstrom, (both gender), (knee), adj 1.400 0.857 2.286 1.345 0.179 6.39 Frey, (men), (knee), adj Frey, (women), (knee), adj 0.715 0.691 2.140 1.747 0.762 0.398 0.446 0.690 1.237 5.83 6.67 1.099 Han, (men), (knee), adj Han, (women), (knee), adj Hart, (women), (knee), adj 1.458 0.748 2.840 1.108 0.268 4.80 0.822 2.770 0.591 1.133 1.143 6.775 -1.165 2.233 0.244 8.13 3.35 Leung, (men), (knee), adj 0.640 0.401 1.022 -1.869 0.062 6.62 Leung, (women), (knee), adj Martin, (men), (knee), adj 0.630 0.740 0.774 1.567 0.513 -4.396 0.000 9.42 0.349 -0.786 0.432 4.19 Martin, (women), (knee), adj 0.560 0.140 2.240 -0.820 0.412 1.71 Monira Hussain, (both gender), (knee), adj Nielen, (both gender), (knee), adj 0.880 0.769 1.301 0.939 0.680 0.497 0.001 1.070 9.52 0.850 10.21 Wang, (both gender) (knee), adj 0.552 0.258 2.247 9,150 1.130 1.68 0.968 0.794 1.180 -0.325 0.745 0.01 0 1 100 Favours OA Favours no OA

Supplementary Figure 5. Forest plots for risk of OA comparing DM to non-DM, sensitivity analysis stratified by site of OA



Supplementary Figure 6. Funnel plots for sensitivity analysis stratified by BMI adjustment

A. Funnel plot for studies with comparable baseline BMI between comparison groups. **B.** Funnel plot for studies with any form of adjustment of BMI.