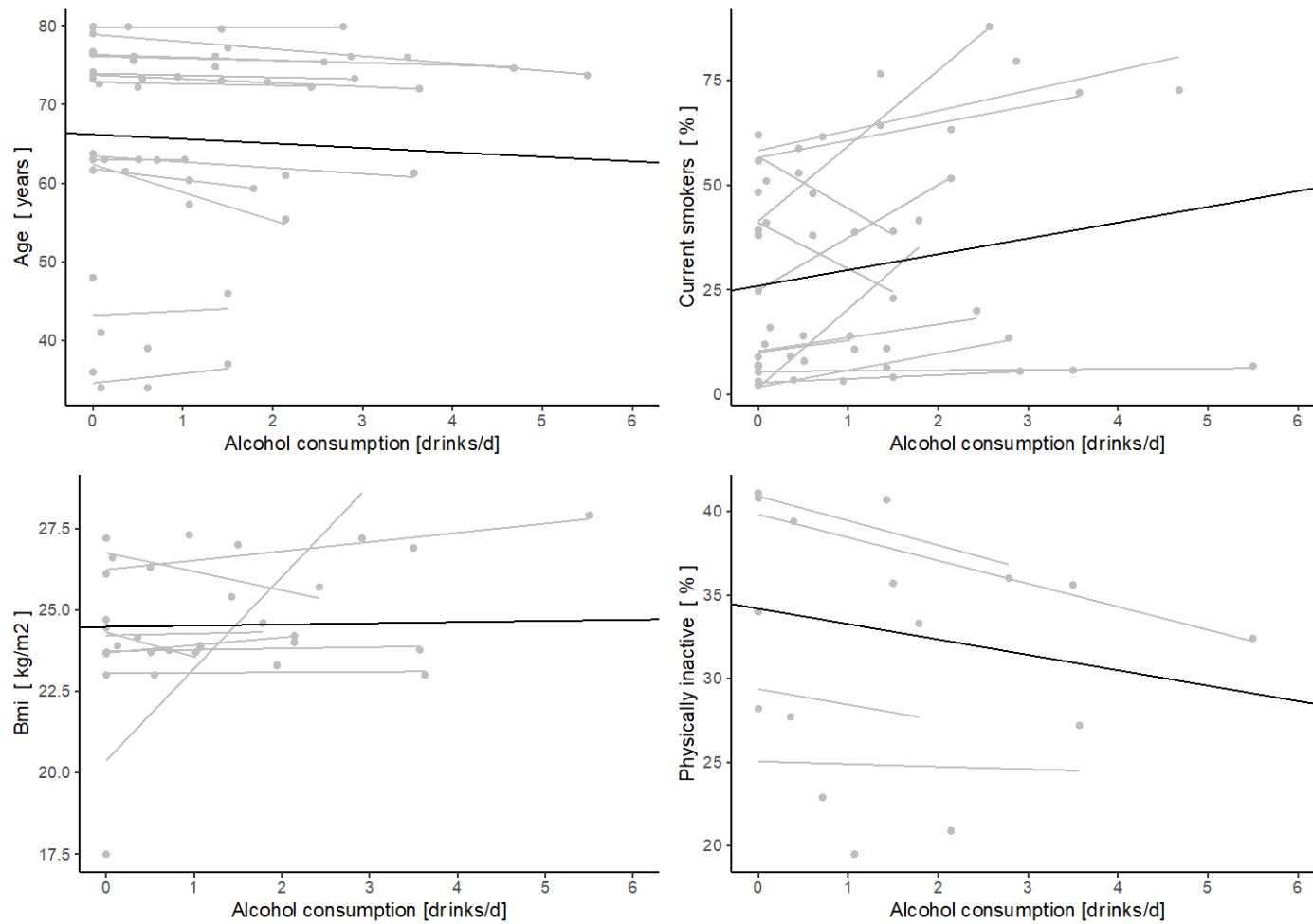
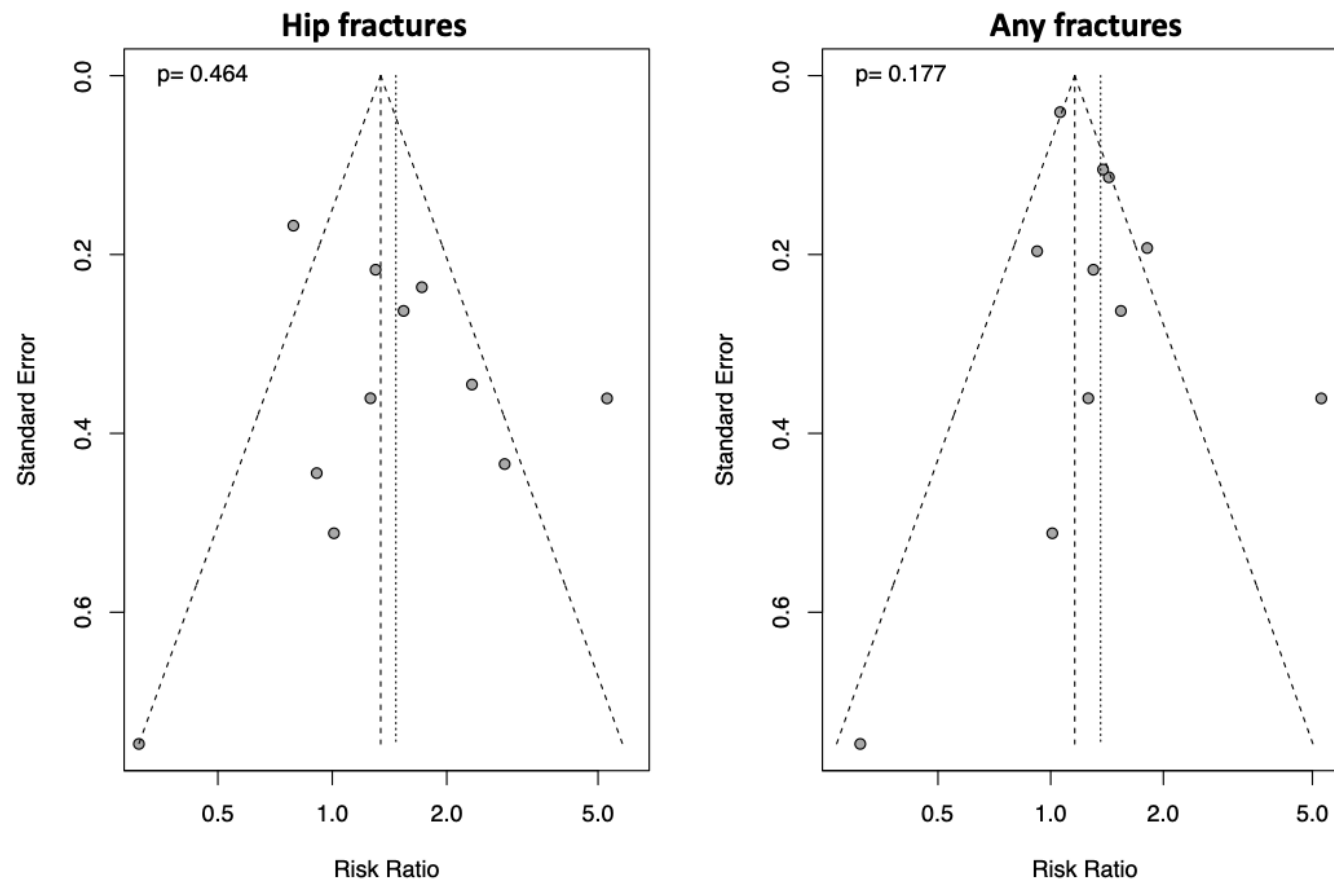


Supplementary Figure S1. Graphical representation of intercepts and slopes of the linear regression examining the relationship between alcohol consumption and age, BMI, percentage of current smokers and physically inactive individuals.

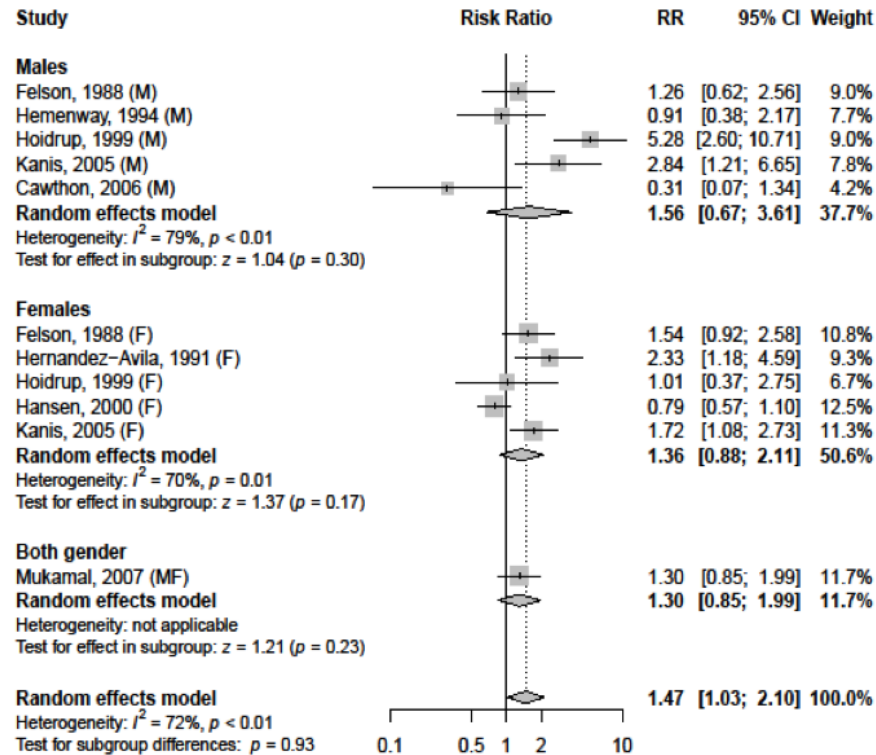


Supplementary Figure S2. Funnel plots of risk of hip and any fractures for the highest vs. the lowest category of alcohol consumption.

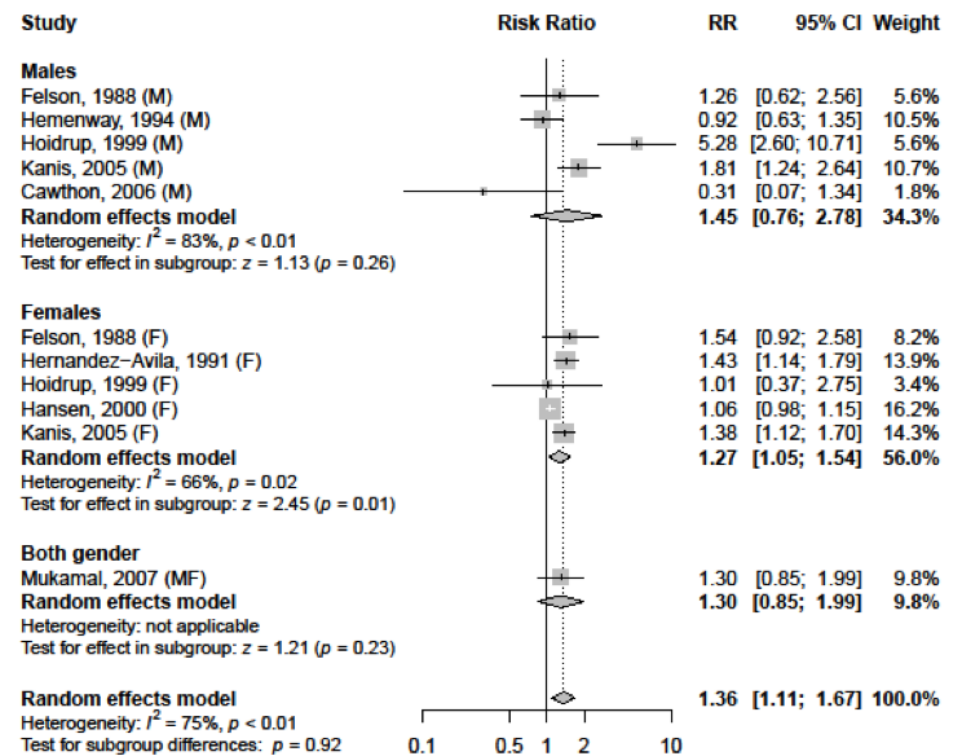


Supplementary Figure S3. Meta-analysis of risk of hip and any fracture for the highest vs. lowest category of alcohol consumption by sex.

Hip fractures by sex

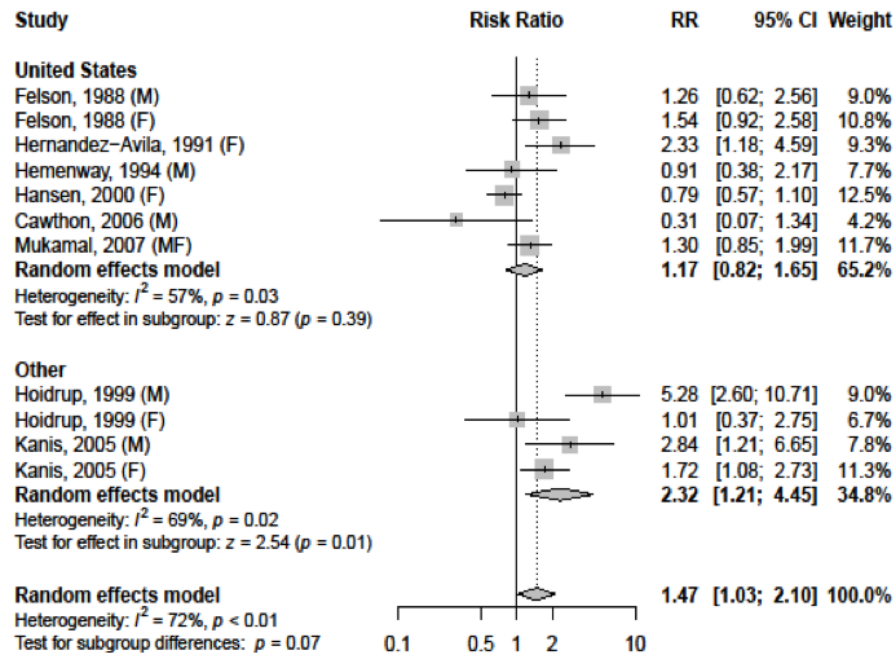


Any fractures by sex

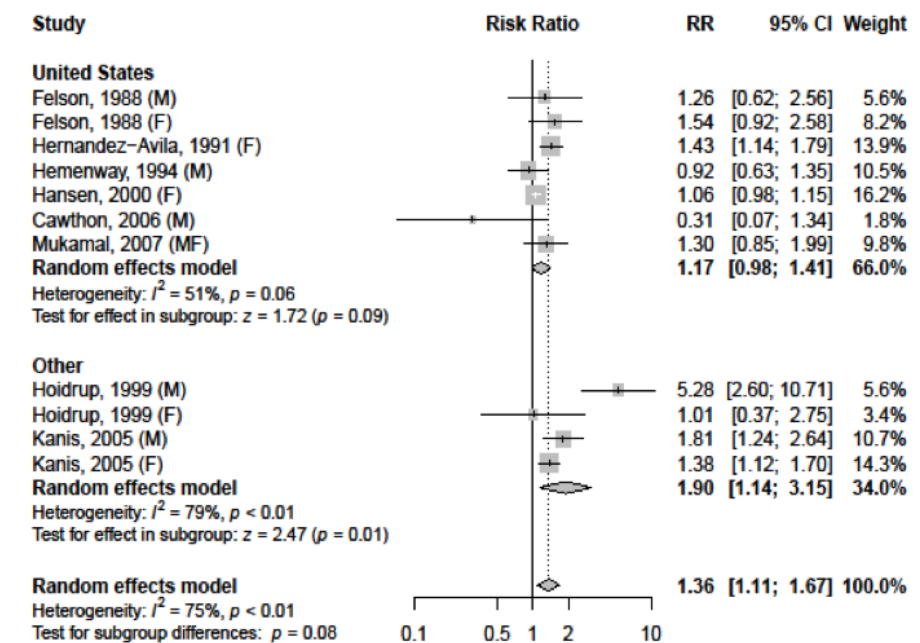


Supplementary Figure S4. Meta-analysis of risk of hip and any fracture for the highest vs. lowest category of alcohol consumption by geographical region.

Hip fractures by region



Any fractures by region



Supplementary Table S1. Numerical data of summary mean differences of bone mineral density in different body segments between various doses of alcohol consumption vs. no consumption.

BMD	Datasets (studies)	Alcohol consumption, drinks/day, Mean difference [95% CI]					<i>I</i>²[%]	<i>P</i>_{heterog}
		0	1	2	3	4		
Lumbar spine	12 (8)	0 [ref.]	0.02 [0.005; 0.035]	0.043 [0.002; 0.083]	0.068 [-0.006; 0.141]	0.092 [-0.015; 0.2]	96.7	<0.001
Femur neck	16 (11)	0 [ref.]	0.013 [0.005; 0.021]	0.016 [0.002; 0.030]	0.013 [-0.026; 0.051]	0.009 [-0.056; 0.075]	99.9	<0.001
Hip	10 (7)	0 [ref.]	0.018 [0.006; 0.03]	0.015 [-0.007; 0.037]	0.005 [-0.047; 0.057]	-0.005 [-0.09; 0.08]	100	<0.001

Supplementary Table S2. Summary slopes of the linear regression examining the relationship between alcohol consumption and age, BMI, percentage of current smokers and physically inactive individuals.

Confounder	Both gender			Males			Females		
	Datasets (studies)	Slope (95% CI)	p	Datasets (studies)	Slope (95% CI)	p	Datasets (studies)	Slope (95% CI)	p
Age [years]	13 (10)	-0.57 (-0.87; -0.26)	<0.001	7 (7)	-0.83 (-1.30; -0.37)	<0.001	5 (5)	-0.32 (-0.97; 0.33)	0.337
BMI [kg/m ²]	8 (7)	0.04 (-0.17; 0.24)	0.728	5 (5)	0.16 (0.02; 0.30)	0.027	2 (2)	-0.25 (-1.09; 0.59)	0.563
Current smokers [%]	12 (9)	3.77 (-1.31; 8.85)	0.146	6 (6)	2.30 (-3.64; 8.25)	0.448	5 (5)	6.22 (-5.11; 17.54)	0.282
Physically inactive [%]	4 (3)	-0.92 (-1.83; -0.01)	0.047	2 (2)	-0.77 (-2.20; 0.66)	0.289	2 (2)	-1.22 (-2.74; 0.30)	0.116

Supplementary Table S3. Dose-response meta-analysis of risk of hip and any fracture for various doses of alcohol consumption by sex.

BDM	Datasets		Alcohol consumption, drinks/day, Mean difference [95% CI]					<i>I</i> ² [%]	<i>P</i> _{heterog}
	(studies)	0	1	2	3	4			
Lumbar									
Males	6 (6)	0 [ref.]	0.013 [0.010; 0.016]	0.020 [0.016; 0.025]	0.024 [0.013; 0.036]	0.028 [0.007; 0.048]	59.8	0.006	
Females	6 (5)	0 [ref.]	0.027 [-0.003; 0.056]	0.076 [-0.006; 0.158]	0.139 [-0.018; 0.295]	0.203 [-0.032; 0.438]	93.8	<0.001	
Femur neck									
Males	7 (7)	0 [ref.]	0.024 [0.017; 0.031]	0.017 [-0.004; 0.039]	-0.005 [-0.071; 0.060]	-0.030 [-0.142; 0.082]	100	<0.001	
Females	8 (7)	0 [ref.]	0.004 [-0.004; 0.013]	0.014 [-0.004; 0.032]	0.027 [-0.016; 0.068]	0.039 [-0.029; 0.108]	89.8	<0.001	
Hip									
Males	4 (4)	0 [ref.]	0.026 [0.015; 0.037]	0.01 [-0.033; 0.052]	-0.024 [-0.135; 0.088]	-0.058 [-0.239; 0.124]	100	<0.001	
Females	5 (4)	0 [ref.]	0.011 [-0.009; 0.031]	0.014 [-0.011; 0.038]	0.013 [-0.01; 0.036]	0.013 [-0.009; 0.034]	98	<0.001	

Supplementary Table S4. Dose-response meta-analysis of risk of hip and any fracture for various doses of alcohol consumption by geographical region.

BDM	Datasets		Alcohol consumption, drinks/day, Mean difference [95% CI]					<i>I</i> ² [%]	<i>P</i> _{heterog}
	(studies)	0	1	2	3	4			
Lumbar									
US	7 (4)	0 [ref.]	0.017 [-0.014; 0.047]	0.054 [-0.02; 0.127]	0.102 [-0.028; 0.233]	0.153 [-0.038; 0.344]	96.6	<0.001	
Other	5 (4)	0 [ref.]	0.015 [0.009; 0.022]	0.021 [0.019; 0.023]	0.022 [0.009; 0.035]	0.021 [-0.006; 0.048]	39.6	0.104	
Femur neck									
US	10 (6)	0 [ref.]	0.014 [0.004; 0.024]	0.011 [-0.008; 0.03]	-0.001 [-0.056; 0.054]	-0.014 [-0.109; 0.081]	99.9	<0.001	
Other	6 (5)	0 [ref.]	0.012 [0.000; 0.023]	0.017 [0.003; 0.031]	0.019 [0.005; 0.034]	0.021 [0.004; 0.038]	93.7	<0.001	
Hip									
US	8 (5)	0 [ref.]	0.018 [0.005; 0.032]	0.015 [-0.012; 0.042]	0.004 [-0.064; 0.071]	-0.008 [-0.118; 0.102]	99.9	<0.001	
Other	2 (2)	0 [ref.]	0.014 [-0.02; 0.048]	0.018 [-0.027; 0.062]	0.018 [-0.029; 0.064]	0.018 [-0.03; 0.065]	98.5	<0.001	