## Smoking and sickness absence: a systematic review and metaanalysis<sup>1</sup>

by Sigrid A Troelstra, MSc, Pieter Coenen, PhD, Cécile RL Boot, PhD,<sup>2</sup> Janneke Harting, PhD, Anton E Kunst, PhD, Allard J van der Beek, PhD

- 1. Supplementary materials
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Search	Query	Items
		found
PubMed		
#4	#1 AND #2 AND #3	1291
#3	"Cost of Illness"[Mesh] OR cost[tiab] OR costs[tiab] OR econom*[tiab] OR	790132
	socioeconom*[tiab] OR productivity[tiab] OR social burden[tiab] OR occupational	
	burden[tiab] OR long-term effect*[tiab] OR long-term implicat*[tiab]	
#2	"Workplace"[Mesh] OR "Occupational Health"[Mesh] OR "Absenteeism"[Mesh] OR	176143
	"Sick Leave"[Mesh] OR "Work Capacity Evaluation"[Mesh] OR "Rehabilitation,	
	Vocational"[Mesh] OR "Return to Work"[Mesh] OR "Sickness Impact Profile"[Mesh]	
	OR "Work Performance"[Mesh] OR "Work Engagement"[Mesh] OR	
	absenteeism[tiab] OR presenteeism[tiab] OR labor market[tiab] OR labour	
	market[tiab] OR "loss of productivity"[tiab] OR "productivity loss"[tiab] OR work	
	day[tiab] OR working day[tiab] OR work time[tiab] OR working time[tiab] OR work	
	hour*[tiab] OR working hour*[tiab] OR "work productivity"[tiab] OR "working	
	productivity"[tiab] OR work function*[tiab] OR "work participation"[tiab] OR work	
	perform*[tiab] OR working perform*[tiab] OR "performance at work"[tiab] OR (early	
	retirement*[tiab] AND disease[tiab]) OR work engage*[tiab] OR work inabilit*[tiab]	
	OR working inabilit*[tiab] OR work abilit*[tiab] OR working abilit*[tiab] OR work	

Table S1. Search strategies in electronic databases.

disabilit*[tiab] OR working disabilit*[tiab] OR work absence*[tiab] OR sickness
absence*[tiab] OR sick absence*[tiab] OR sickness leave*[tiab] OR sick leave*[tiab]
OR activity impairment[tiab] OR "occupational health"[tiab] OR employee*[tiab] OR
work break*[tiab] OR lost work time[tiab] OR lost working time[tiab] OR missed
work time[tiab] OR productivity impairment[tiab] OR work impairment[tiab] OR
workplace*[tiab] OR work-place*[tiab] OR worksite*[tiab] OR work-site*[tiab] OR
job perform*[tiab] OR task perform*[tiab] OR work day loss*[tiab] OR work time
loss*[tiab] OR sick day*[tiab] OR illness day*[tiab] OR work capacit*[tiab] OR
working capacit*[tiab] OR work incapacit*[tiab] OR working incapacit*[tiab] OR work
incapabilit*[tiab] OR medical leave*[tiab] OR disability leave*[tiab] OR disability
absence*[tiab] OR time lost[tiab]

 #1
 "Smokers"[Mesh] OR "Smoking"[Mesh] OR "Tobacco Use"[Mesh] OR "Tobacco Use
 335284

 Disorder"[Mesh] OR smoke[tiab] OR smoker\*[tiab] OR smoking\*[tiab] OR
 tobacco[tiab] OR cigarette\*[tiab] OR sigarette\*[tiab] OR nicotine[tiab]

Embase		
#4	#1 AND #2 AND #3	2345
#3	'cost of illness'/exp OR cost:ab,ti,kw OR costs:ab,ti,kw OR econom*:ab,ti,kw OR	987200
	socioeconom*:ab,ti,kw OR productivity:ab,ti,kw OR 'social burden':ab,ti,kw OR	
	'occupational burden':ab,ti,kw OR 'long-term effect*':ab,ti,kw OR 'long-term	
	implicat*':ab,ti,kw	
#2	'workplace'/exp OR 'occupational health'/exp OR 'absenteeism'/exp OR 'medical	352034
	leave'/exp OR 'return to work'/exp OR 'sickness impact profile'/exp OR 'job	
	performance'/exp OR 'work engagement'/exp OR absenteeism:ab,ti,kw OR	
	presenteeism:ab,ti,kw OR 'labor market':ab,ti,kw OR 'labour market':ab,ti,kw OR	
	'loss of productivity':ab,ti,kw OR 'productivity loss':ab,ti,kw OR 'work day':ab,ti,kw	
	OR 'working day':ab,ti,kw OR 'work time':ab,ti,kw OR 'working time':ab,ti,kw OR	
	'work hour*':ab,ti,kw OR 'working hour*':ab,ti,kw OR 'work productivity':ab,ti,kw OR	
	'working productivity':ab,ti,kw OR 'work function*':ab,ti,kw OR 'work	

	participation':ab,ti,kw OR 'work perform*':ab,ti,kw OR 'working perform*':ab,ti,kw	
	OR 'performance at work':ab,ti,kw OR (('early retirement*' NEAR/3 disease):ab,ti,kw)	
	OR 'work engage*':ab,ti,kw OR 'work inabilit*':ab,ti,kw OR 'working	
	inabilit*':ab,ti,kw OR 'work abilit*':ab,ti,kw OR 'working abilit*':ab,ti,kw OR 'work	
	disabilit*':ab,ti,kw OR 'working disabilit*':ab,ti,kw OR 'work absence*':ab,ti,kw OR	
	'sickness absence*':ab,ti,kw OR 'sick absence*':ab,ti,kw OR 'sickness leave*':ab,ti,kw	
	OR 'sick leave*':ab,ti,kw OR 'activity impairment':ab,ti,kw OR 'occupational	
	health':ab,ti,kw OR employee*:ab,ti,kw OR 'work break*':ab,ti,kw OR 'lost work	
	time':ab,ti,kw OR 'lost working time':ab,ti,kw OR 'missed work time':ab,ti,kw OR	
	'productivity impairment':ab,ti,kw OR 'work impairment':ab,ti,kw OR	
	workplace*:ab,ti,kw OR 'work-place*':ab,ti,kw OR worksite*:ab,ti,kw OR 'work-	
	site*':ab,ti,kw OR 'job perform*':ab,ti,kw OR 'task perform*':ab,ti,kw OR 'work day	
	loss*':ab,ti,kw OR 'work time loss*':ab,ti,kw OR 'sick day*':ab,ti,kw OR 'illness	
	day*':ab,ti,kw OR 'work capacit*':ab,ti,kw OR 'working capacit*':ab,ti,kw OR 'work	
	incapacit*':ab,ti,kw OR 'working incapacit*':ab,ti,kw OR 'work incapabilit*':ab,ti,kw	
	OR 'medical leave*':ab,ti,kw OR 'disability leave*':ab,ti,kw OR 'disability	
	absence*':ab,ti,kw OR 'time lost':ab,ti,kw	
#1	'tobacco use'/exp OR 'tobacco dependence'/exp OR smoke:ab,ti,kw OR	493021
	smoker*:ab,ti,kw OR smoking*:ab,ti,kw OR tobacco:ab,ti,kw OR cigarette*:ab,ti,kw	
	OR sigarette*:ab,ti,kw OR nicotine:ab,ti,kw	
Cochrane		
#4	#1 AND #2 AND #3	117
#3	cost:ab,ti,kw or costs:ab,ti,kw or econom*:ab,ti,kw or socioeconom*:ab,ti,kw or	77915
	productivity:ab,ti,kw or "social burden":ab,ti,kw or "occupational burden":ab,ti,kw	
	or "long-term effect*":ab,ti,kw or 'long-term implicat*':ab,ti,kw	
#2	absenteeism:ab,ti,kw or presenteeism:ab,ti,kw or "labor market":ab,ti,kw or "labour	14455
	market":ab,ti,kw or "loss of productivity":ab,ti,kw or "productivity loss":ab,ti,kw or	
	"work day":ab,ti,kw or "working day":ab,ti,kw or "work time":ab,ti,kw or "working	

#1

#2

time":ab,ti,kw or "work hour\*":ab,ti,kw or "working hour\*":ab,ti,kw or "work productivity":ab,ti,kw or "working productivity":ab,ti,kw or "work function\*":ab,ti,kw or "work participation":ab,ti,kw or "work perform\*":ab,ti,kw or "working perform\*":ab,ti,kw or "performance at work":ab,ti,kw or ("early retirement\*" near/3 disease):ab,ti,kw or "work engage\*":ab,ti,kw or "work inabilit\*":ab,ti,kw or "working inabilit\*":ab,ti,kw or "work abilit\*":ab,ti,kw or "working abilit\*":ab,ti,kw or "work disabilit\*":ab,ti,kw or "working disabilit\*":ab,ti,kw or "work absence\*":ab,ti,kw or "sickness absence\*":ab,ti,kw or "sick absence\*":ab,ti,kw or "sickness leave\*":ab,ti,kw or "sick leave\*":ab,ti,kw or "activity impairment":ab,ti,kw or "occupational health":ab,ti,kw or employee\*:ab,ti,kw or "work break\*":ab,ti,kw or "lost work time":ab,ti,kw or "lost working time":ab,ti,kw or "missed work time":ab,ti,kw or "productivity impairment":ab,ti,kw or "work impairment":ab,ti,kw or workplace\*:ab,ti,kw or "work-place\*":ab,ti,kw or worksite\*:ab,ti,kw or "work-site\*":ab,ti,kw or "job perform\*":ab,ti,kw or "task perform\*":ab,ti,kw or "work day loss\*":ab,ti,kw or "work time loss\*":ab,ti,kw or "sick day\*":ab,ti,kw or "illness day\*":ab,ti,kw or "work capacit\*":ab,ti,kw or "working capacit\*":ab,ti,kw or "work incapacit\*":ab,ti,kw or "working incapacit\*":ab,ti,kw or "work incapabilit\*":ab,ti,kw or "medical leave\*":ab,ti,kw or "disability leave\*":ab,ti,kw or "disability absence\*":ab,ti,kw or "time lost":ab,ti,kw

smoke:ab,ti,kw or smoker\*:ab,ti,kw or smoking\*:ab,ti,kw or tobacco:ab,ti,kw or 24915 cigarette\*:ab,ti,kw or sigarette\*:ab,ti,kw or nicotine:ab,ti,kw

#1

Table S2. Criteria list of assessment of methodological quality of studies. Criteria could be rated yes, no, or not applicable. n = sample size; CI = confidence interval; SE = standard error.

## Criteria

- 1. Was the research question or objective clearly stated?
- 2. Was the study sample clearly specified and defined? (incl. clear in- and exclusion criteria)
- 3. Was the participation rate of eligible persons at least 50%?
- 4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)?
- 5. Was the sample size suitable for answering the research question?
- 6. For longitudinal studies: Was loss to follow-up after baseline 20% or less?
- 7. Were the exposure measures clearly defined, valid, reliable, and implemented consistently across all study participants?
- 8. Were the outcome measures clearly defined, valid, reliable, and implemented consistently across all study participants?
- 9. Was the statistical model used appropriate and described with point estimates and measures of precision (i.e. CI or SE)?
- 10. Were important confounding variables (i.e. age, gender, socioeconomic position (education, job, income)) measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?

Figure S3. Study findings (i.e. effect sizes and risk of bias) stratified by study location (i.e. western and non-western countries), for articles reporting on the association of smoking and risk of sickness

absence.	Individual	study	as	well	as	pooled	effects	are	presented.
						Rate Ratio		Risk	of Bias
Study or Subgro	oup log[Rate Ratio	oj se	Weight			IV, Random, 95%	o Cl	ABCDE	FGHIJ
Z.1.1 Western	0.000		2.00						
VVacker 2013	-0.290	4 U.1441 5 0.4705	2.0%						
Pal 2009 (1) Deles 2004	-0.084	5 0.4725	0.3%						
BUIES 2004 Kinimaäki 4.007	-0.060	0.00047	0.9%			1			
Kivimaki 1997 Airokoinen 2010	0.019	8 0.0847	3.9%			L			
Alfaksinen 2018	0.104	4 U.UZ35 7 0.0050	0.8%						
Kansson 2010	0.133	7 0.2203	1.0%						
Alavinia 2009 Dobrook 2011	0.139	0 0.0401 7 0.0504	0.1% 5.50/			_			
Robroek 2011	0.10	/ 0.0004 / 0.0607	0.0%			_		200	
Aprilia 2001	0.17	4 0.0007 0 0.1401	4.070						
Kowloccor 2013	0.174	0 0.1401 6 0.0112	2.170						2
Teoi 2011	0.10	6 0.0113 6 0.124	2.5%			L			20000
Niedbammer 10	0.100 10972\ 0.231	0.124 1 0.0647	19%			-			
Roos 2017 (2)	0.231 0.231 0.231	5 0.0047	4.070 67%						
Christenson 201	0.243	J 0.0230 A 0.191	1.4%						2
Morrill 2013	0.200	4 0.101 A 0.0473	5.7%			-			
Roos 2017 (5)	0.202	a nnsaa	5.0%			-			
Sindelar 2005	0.314	8 N N 938	3.5%			-			
Robroek 2013	0.370	2 0.0000 2 0.1337	23%			<b></b>			
Niedhammer 19	98 (6) 0.371	6 0.1007 6 0.1119	2.0%						
Morikawa 2004	(7) 0.408	8 0.0539	5.3%			-			2
Torres Lana 2004	0.400 15 0.412	1 01805	1.5%						
Pai 2009 (8)	0.425	3 0 1825	1.4%						
Christensen 20	17 (9) 0.50	2 01589	1.8%						2000
Roelen 2018	0.667 0.667	8 0 2435	0.9%						
Bush 1995 Subtotal (95% C	0.67	8 0.084	3.9%			-			
Heterogeneity: T	" "au" = 0.01; Chi" = 110.0	3, df = 25 (	P < 0.00001);	l² = 77%		ľ			
Test for overall e	effect: Z = 9.19 (P < 0.000	)01)							
2.1.2 Non-weste	ern								
Suwa 2017	0.139	8 0.0879	3.7%			-		$\mathbf{\Theta}$	
Rabacow 2014	0.215	1 0.1123	2.9%			-			? • • • •
Morikawa 2004	(10) 0.357	7 0.1024	3.2%			-			? • • • •
Kondo 2006 Subtotal (95% C	0.430 I)	2 0.3943	0.4% 10.1%			•			
Heterogeneity: T	au² = 0.00; Chi² = 2.88, i effect: 7 = 4.09 (P < 0.000	df = 3 (P =	0.41); I² = 0%						
Testion overall e	silect. 2 = 4.03 (1 × 0.000	///							
Total (95% CI)			100.0%			. !			
Heterogeneity: T Test for overall e	"au" = 0.01; Chi" = 113.3 effect: Z = 9.84 (P < 0.000	0, df = 29 ( )01)	P < 0.00001);	I² = 74%	0.01 (	).1 1 s smoking Eavou	10 100		
Test for subgrou	up differences: Chi² = 0.0	12, df = 1 (F	$P = 0.90), I^2 = I$	0%	i avoui	S SHIOKING T AVOU	ins non-smoking	,	
Footnotes					Risk of bia	as legend			
(1) males					(A) Study	aim			
(2) females					(B) Study	population definition	n		
(3) females					(C) Study	participation			
(4) males					(D) Partici	pant selection			
(5) males					(E) Study p	population size			
(6) males					(F) Study a	attrition			
(7) United Kingd	lom				(G) Expos	ure			
(8) females					(H) Outcor	me			
(9) females					(I) Statistic	cal analysis			
(10) Japan					(J) Study (	confounding			

Figure S4. Study findings (i.e. effect sizes and risk of bias) stratified by gender of the study sample (i.e. mixed, mainly males (>75%) and mainly females (>75%)), for articles reporting on the association of smoking and risk of sickness absence. Individual study as well as pooled effects are presented.

				Rate Ratio	Risk of Bias
Study or Subgroup	log[Rate Ratio]	SE	Weight	IV, Random, 95% CI	ABCDEFGHIJ
2.2.1 Mixed					
Wacker 2013	-0.2904	0.1441	2.0%		
Boles 2004	-0.0651	0.2474	0.9%		
Karlsson 2010	0.1337	0.2253	1.0%		
Suwa 2017	0.1398	0.0879	37%	-	
Bahraek 2011	0.157	0.0504	5.5%	-	
Servner 2001	0.131	0.0504	1.6%	-	
Aavikenn 2001	0.174	0.0007	2106	-	
Kowloccor 2011	0.1740	0.1401	2.170	_	
Pobacow 2014	0.100	0.0113	2.00		
Morrill 2012	0.2131	0.1123	2.370 5.70	-	
Dindolox 2005	0.2024	0.0473	0.770 0.500	-	
Sindelar 2005	0.3148	0.0938	3.3%		
RUDIUER 2013	0.3202	0.1337	2.370		
Tomes Lana 2005	0.4121	0.1805	1.5%		
Roelen 2018	0.00/8	0.2435	0.9%		
Bush 1995	0.678	0.084	3.9%	· -	
Subiotal (95% CI)			47.0%	•	
Heterogeneity: Tau <sup>2</sup> = 0.1 Test for overall effect: Z =	01; Chi² = 57.08, di = 5.65 (P ≺ 0.00001	f=14 (P <  )	< 0.00001); I² = 75%		
2.2.2 Mainly males (>75	%)				
Pai 2009 (1)	-0.0845	0.4725	0.3%		
Airaksinen 2018	0.1044	0.0235	6.8%		$\bullet \bullet ? \bullet \bullet ? \bullet \bullet \bullet \bullet$
Alavinia 2009	0.1398	0.0401	6.1%	•	
Tsai 2011	0.1865	0.124	2.5%		
Christensen 2007 (2)	0.2604	0.181	1.4%	+	
Roos 2017 (3)	0.3079	0.0599	5.0%	-	
Morikawa 2004 (4)	0.3577	0.1024	3.2%	+	
Niedhammer 1998 (5)	0.3716	0.1119	2.9%	-	
Morikawa 2004 (6)	0.4088	0.0539	5.3%	-	
Kondo 2006	0.4302	0.3943	0.4%		
Subtotal (95% CI)			33.9%	•	
Heterogeneity: Tau² = 0.1 Test for overall effect: Z =	01; Chi² = 40.75, di • 5.00 (P ≤ 0.00001	f=9(P≺  )	0.00001); I² = 78%		
2.2.2 Mainly formalian (b)	750/)				
2.2.3 Mainly remaies (>)	(5%)				
Kivimaki 1997	0.0198	0.0847	3.9%	Ť	
Niedhammer 1998 (7)	0.2311	0.0647	4.8%	-	
Roos 2017 (8)	0.2495	0.0258	6.7%		
Pai 2009 (9)	0.4253	0.1825	1.4%		
Christensen 2007 (10)	0.502	0.1589	1.8%	-	
Subtotal (95% CI)			18.6%	•	
Heterogeneity: Tau² = 0.1 Test for overall effect: Z =	01; Chi² = 10.66, dt = 4.06 (P ≤ 0.0001)	f= 4 (P =	0.03); I² = 62%		
Total (95% CI)			100.0%	•	
Heterogeneity: Tau <sup>2</sup> = 0.1	01: Chi≅= 113 30 µ	df = 29 /P	< 0.00001): 12 = 74%		
Test for overall effect: 7 =	9 84 (P < 0 00001	0	0.00001/,1 11/0	0.01 0.1 1 10	100
Test for subgroup differe	- 3.04 (i 4 0.0000) inces: Chi≷ – 0.12	df = 2 (P	- 0 QA) 12 - 0%	Favours smoking Favours non-smo	oking
Footnotes		si – ∠ (r	- 0.047,1 - 0.0	Disk of bias legend	
(1) males				(A) Study sim	
(1) males				(A) Study anni (D) Study population definition	
(2) males				(C) Study population definition	
(J) Indies				(C) Study participation (D) Participant collection	
(4) Japan (5) moleo				(D) Fancipant selection	
(C) Indies				(E) Study population Size	
(0) United Kingdom				(F) Study attrition	
(7) females				(U) Exposure	
(8) females				(H) Outcome	
(9) females				(I) Statistical analysis	
(10) females				(J) Study confounding	

Figure S5. Study findings (i.e. effect sizes and risk of bias) stratified by mean age of the study sample (i.e. <40 years, 40 to 48 years and >48 years), for articles reporting on the association of smoking and risk of sickness absence. Individual study as well as pooled effects are presented.

				Rate Ratio	Risk of Bias
Study or Subgroup	log[Rate Ratio]	SE	Weight	IV, Random, 95% Cl	ABCDEFGHIJ
2.8.1 < 40 years					
Airaksinen 2018	0.1044	0.0235	6.8%	t to the second s	
Rabacow 2014	0.2151	0.1123	2.9%		
Sindelar 2005 Kondo 2006	0.3148	0.0938	3.5% 0.4%	-	
Ruch 1995	0.4302	0.3943	0.470 3.094	-	
Subtotal (95% CI)	0.070	0.004	17.4%	•	
Heterogeneity: Tau <sup>2</sup> = 0.0	17; Chi² = 47.05, df	= 4 (P <	0.00001); I² = 91%	-	
Test for overall effect: Z =	2.49 (P = 0.01)				
20240 40 voare					
2.0.2 40 - 40 years	0.0046	0 4725	0.204		
Pai 2009 (1) Boles 2004	-0.0843	0.4725	0.3%0		
Kivimäki 1997	0.0198	0.0847	3.9%	+	
Alavinia 2009	0.1398	0.0401	6.1%	•	
Suwa 2017	0.1398	0.0879	3.7%	-	
Robroek 2011	0.157	0.0504	5.5%	-	
Serxner 2001	0.174	0.0687	4.6%	-	
Aaviksoo 2013	0.1748	0.1401	2.1%		
Kowiessar 2011 Tool 2014	U.180 0.1965	0.0113	7.1% 2.5%		
Morrill 2013	0.1605	0.124	2.0%	•	
Robroek 2013	0.2024	0.0473	2.3%		
Morikawa 2004 (2)	0.3577	0.1024	3.2%	+	
Niedhammer 1998 (3)	0.3716	0.1119	2.9%		
Morikawa 2004 (4)	0.4088	0.0539	5.3%	-	
Torres Lana 2005	0.4121	0.1805	1.5%		
Pai 2009 (5)	0.4253	0.1825	1.4%	-	
Roelen 2018	0.6678	0.2435	0.9%		
Subtotal (95% CI)	0. 05 Z = 20.04 df	- 47 (D -	0.004): IZ = 570	·	
Test for overall effect: Z =	10, CHF = 39.81, U 8.28 (P < 0.00001	= 17 (P = )	= 0.001), I= = 57%		
		<i>,</i>			
2.8.3 > 48 years					
Wacker 2013	-0.2904	0.1441	2.0%		
Karlsson 2010	0.1337	0.2253	1.0%		
Nieunammer 1998 (6) Roos 2017 (7)	0.2311	0.0047	4.8% 6.7%	•	
Roos 2017 (7)	0.2435	0.0200	5.0%	•	
Subtotal (95% CI)	0.001.0	0.0000	19.6%	•	
Heterogeneity: Tau <sup>2</sup> = 0.0	1; Chi <sup>2</sup> = 15.20, df	= 4 (P =	0.004); I² = 74%		
Test for overall effect: Z =	2.98 (P = 0.003)				
2.9.4 Undefined					
Christenson 2007 (0)	0.2604	0 1 0 1	1 404		
Christensen 2007 (9) Christensen 2007 (10)	0.2004	0.101	1.470	_	
Subtotal (95% CI)	0.502	0.1000	3.2%	◆	
Heterogeneity: Tau <sup>2</sup> = 0.0	10; Chi² = 1.01, df =	: 1 (P = 0	.32); I² = 1%	-	
Test for overall effect: Z =	3.31 (P = 0.0009)				
Total (05% CI)			100.0%		
Heterogeneity: Tau <sup>2</sup> – 0.0	1. Chiz - 112 20 /	4f - 20 /⊑	00.0% ≥ 0.00001\:E = 7.4%		
Test for overall effect: 7 =	9 84 (P < 0 00001	an 23 (n )	~ 0.00001),1 = 74.0	0.01 0.1 1 10 100	
Test for subaroup differe	nces: Chi <sup>2</sup> = 3.05.	/ df=3 (P	= 0.38), <b> ²</b> = 1.6%	Favours smoking Favours non-smoking	
Footnotes				Risk of bias legend	
(1) males				(A) Study aim	
(2) Japan				(B) Study population definition	
(3) males				(C) Study participation	
(4) United Kingdom				(D) Participant selection	
(5) females				(E) Study population size	
(o) remaies (7) females				(F) Study attrition	
(7) lendes (8) males				(H) Outcome	
(9) males				(I) Statistical analysis	
(10) females				(J) Study confounding	
-					

SE = standard error; CI = confidence interval; IV = Inverse variance.

Figure S6. Study findings (i.e. effect sizes and risk of bias) stratified by occupational class (i.e. mixed, blue collar, pink collar and white collar), for articles reporting on the association of smoking and risk of

effects

are

presented.

Individual study as well as pooled

sickness

absence.

			Dete	Defie	
Study or Subaroup	log[Rate Ratio]	SF Weight	Rate IV. Rando	Ratio m. 95% Cl	RISKOTBIAS
2.3.1 Mixed	log[nuto nuto]	or morgin	n ji kanao		
Wacker 2013	-0.2904 0.1	441 2.0%	-		
Boles 2004	-0.0651 0.2	474 0.9%			
Karlsson 2010	0.1337 0.2	253 1.0%	-		
Suwa 2017	0.1398 0.0	879 3.7%		-	
Robroek 2011	0.157 0.0	504 5.5%		-	
Serxner 2001	0.174 0.0	687 4.6% 404 2.400	_		
KavikSUU 2013 Kowleeeor 2011	0.1740 0.1	401 Z.1% 112 7.1%		•	
Romessal 2011 Reherow 2014	0.160 0.0	173 7.170		-	
Niedhammer 1998 (1)	0.2131 0.1	647 4.8%		-	
Christensen 2007 (2)	0.2604 0.	181 1.4%	-	-	
Sindelar 2005	0.3148 0.0	938 3.5%		+	
Robroek 2013	0.3202 0.1	337 2.3%		-	
Niedhammer 1998 (3)	0.3716 0.1	119 2.9%		-	
Kondo 2006	0.4302 0.3	943 0.4%	-	- <u>-</u> -	
Christensen 2007 (4)	0.502 0.1	589 1.8%		-	
Roelen 2018	0.6678 0.2	435 0.9%			
Bush 1995	0.678 0.	084 3.9%		.+	
Subtotal (95% CI)		51./%		•	
Heterogeneity: Tau² = 0. Test for overall effect: Z =	D1; Chi² = 60.62, df = 1 = 6.17 (P < 0.00001)	7 (P < 0.00001	);  * = 72%		
2.3.2 Blue collar					
Alavinia 2009	0.1398 0.0	401 6.1%		-	
Tsai 2011	0.1865 0.	124 2.5%		-	
Morikawa 2004 (5)	0.4088 0.0	539 5.3%		•	
Subtotal (95% CI)		13.9%		◆	
Heterogeneity: Tau² = 0. Test for overall effect: Z =	03; Chi² = 16.18, df = 2 = 2.42 (P = 0.02)	(P = 0.0003); I	²= 88%		
2.3.3 Pink collar					
Poi 2000 (6)	-0.0945 0.4	725 0.2%			
Merrill 2003 (0)	0.0043 0.4	723 0.370 473 57%		•	
Torres Lana 2005	0.2024 0.0	805 1.5%			
Pai 2009 (7)	0.4253 0.1	825 1.4%		_ <b>_</b> _	
Subtotal (95% CI)		8.8%		•	
Heterogeneity: Tau <sup>2</sup> = 0.1	00; Chi² = 1.90, df = 3 (	P = 0.59); I <sup>2</sup> = 0	)%		
Test for overall effect: Z =	= 6.29 (P < 0.00001)				
2.3.4 White collar					
Kivimäki 1997	0.0198 0.0	847 3.9%	-		
Airaksinen 2018	0.1044 0.0	235 6.8%			
R00S 2017 (8)	0.2495 0.0	258 6.7%			
RUUS 2017 (9) Marikawa 2004 (10)	0.3079 0.0	099 0.0% 004 0.0%		- -	
Subtotal (95% CI)	0.3377 0.1	024 3.2% 25.6%		•	
Heterogeneity: Tou <sup>2</sup> = 0.	01: Chiř = 28 75 df = 4	(P < 0.00001)	1 <sup>2</sup> - 86%	*	
Test for overall effect: Z =	= 3.81 (P = 0.0001)	(1 0.00001),			
Total (95% CI)		100.0%		•	
Heterogeneity: Tau <sup>2</sup> = 0.	01; Chi² = 113.30, df =	29 (P < 0.0000	11); I <sup>2</sup> = 74%		
Test for overall effect: Z =	9.84 (P < 0.00001)		Eavours smoking	Favoure non-emoking	
Test for subgroup differe	ences: Chi² = 1.20, df =	3 (P = 0.75), I <sup>2</sup>	= 0%	avours non-smoking	
Footnotes			Risk of bias legend		
(1) females			(A) Study aim		
(2) males			(B) Study population of	definition	
(3) males			(C) Study participation	1	
(4) females			(D) Participant selecti	on	
(5) United Kingdom			(E) Study population s	size	
(b) males			(F) Study attrition		
(7) remaies			(U) Outparts		
(o) remaies			(I) Statistical analysis		
(10) Janan			(I) Study confounding	1	
(.0)04940			(e) olady comodition	,	

SE = standard error; CI = confidence interval; IV = Inverse variance.

Figure S7. Study findings (i.e. effect sizes and risk of bias) stratified by study design (i.e. longitudinal and cross-sectional) for articles reporting on the association of smoking and risk of sickness absence.

Individual	study	as	well a	as pooled	effects	are	presented.
Study or Subgroup	log[Rate Ratio	] <u>S</u> E	Weight	Rate IV, Rand	e Ratio om, 95% Cl	Risk ABCDE	ofBias FGHIJ
2.4.1 Longitudinal Kivimäki 1997 Airaksinen 2018 Karlsson 2010 Alavinia 2009 Tsai 2011 Rabacow 2014 Niedhammer 1998 ( Roos 2017 (4) Robroek 2013 Morikawa 2004 (5) Niedhammer 1998 ( Morikawa 2004 (7) Kondo 2006 Christensen 2007 (6 Roelen 2018 Subtotal (95% C1)	0.019 0.104 0.133 0.139 0.186 0.215 1) 0.231 0.249 0) 0.260 0.320 0.357 6) 0.371 0.408 0.430 0.430 0.667	3         0.0847           4         0.0235           7         0.2253           3         0.0401           5         0.124           1         0.1123           1         0.0647           5         0.0258           4         0.181           3         0.0599           2         0.1337           7         0.1024           3         0.0539           2         0.3943           2         0.3943           2         0.3943           2         0.32435	3.9% 6.8% 1.0% 6.1% 2.5% 2.9% 4.8% 6.7% 1.4% 5.0% 2.3% 3.2% 2.9% 5.3% 0.4% 1.8% 0.9% 5.8%	-	• • • • • • • • • • • • • • • • • • •		
Heterogeneity: Tau² Test for overall effect	= 0.01; Chi <sup>z</sup> = 58.89, I: Z = 7.32 (P < 0.000	df = 16 (P 01)	< 0.00001); I² = 73%	,			
2.4.2 Cross-section Wacker 2013 Pai 2009 (9) Boles 2004 Suwa 2017 Robroek 2011 Serxner 2001 Aaviksoo 2013 Kowlessar 2011 Merrill 2013 Sindelar 2005 Torres Lana 2005 Pai 2009 (10) Bush 1995 Subtotal (95% CI) Heterogeneity: Tau <sup>2</sup> Test for overall effect	al -0.290 -0.084 -0.065 0.139 0.15 0.17 0.174 0.18 0.262 0.314 0.425 0.67 = 0.01; Chi <sup>2</sup> = 54.28, : Z = 5.02 (P < 0.000	<ul> <li>4 0.1441</li> <li>5 0.4725</li> <li>4 0.2474</li> <li>3 0.0879</li> <li>7 0.0504</li> <li>4 0.0687</li> <li>3 0.1401</li> <li>6 0.0113</li> <li>4 0.0473</li> <li>3 0.0938</li> <li>1 0.1805</li> <li>3 0.1825</li> <li>3 0.084</li> <li>df= 12 (P</li> <li>01)</li> </ul>	2.0% 0.3% 0.9% 3.7% 5.5% 4.6% 2.1% 7.1% 5.7% 3.5% 1.4% 3.9% 42.2% < 0.00001); I <sup>2</sup> = 78%		- - - - - - - - - - - - - - - -		
Total (95% CI) Heterogeneity: Tau <sup>2</sup> Test for overall effect Test for subgroup di <u>Footnotes</u> (1) females (2) females (3) males (4) males (5) Japan (6) males (7) United Kingdom (8) females (9) males (10) females	= 0.01; Chi <sup>2</sup> = 113.3 : Z = 9.84 (P < 0.000 fferences: Chi <sup>2</sup> = 0.1	), df = 29 ( 01) 7, df = 1 (F	<b>100.0%</b> P < 0.00001); I <sup>a</sup> = 74 <sup>4</sup> P = 0.68), I <sup>a</sup> = 0%	<ul> <li>0.01 0.1 Favours smoking</li> <li>Risk of bias legend</li> <li>(A) Study aim</li> <li>(B) Study population</li> <li>(C) Study participatio</li> <li>(D) Participant select</li> <li>(E) Study population</li> <li>(F) Study attrition</li> <li>(G) Exposure</li> <li>(H) Outcome</li> <li>(J) Study confoundin</li> </ul>	definition n size	⊣ I0 ing	

Figure S8. Study findings (i.e. effect sizes and risk of bias) stratified by assessment of sickness absence (i.e. self-reported sickness absence and sickness absence records) for articles reporting on the association of smoking and risk of sickness absence. Individual study as well as pooled effects are presented.

				Rate Ratio	Risk of Bias
Study or Subgroup	log[Rate Ratio]	SE	Weight	IV, Random, 95% CI	ABCDEFGHIJ
2.6.1 Self-reported sick	less absence				
Wacker 2013	-0.2904	0.1441	2.0%	-	
Boles 2004	-0.0651	0.2474	0.9%		
Karlsson 2010	0.1337	0.2253	1.0%		
Suwa 2017	0.1398	0.0879	3.7%		
Robroek 2011	0.157	0.0504	5.5%	-	
Serxner 2001	0.174	0.0687	4.6%	-	
Aaviksoo 2013	0.1748	0.1401	2.1%	+	
Kowlessar 2011	0.186	0.0113	7.1%	•	
Roos 2017 (1)	0.2495	0.0258	67%		<b></b>
Merrill 2013	0.2624	0.0473	57%	-	
Roos 2017 (2)	0.3079	0.0599	5.0%	-	
Sindelar 2005	0.3148	0.0000	3.5%	+	
Robroek 2013	0.3202	0.0000	23%		
Kondo 2006	0.4302	0.1001	0.4%		
Ruch 1995	0.4502	0.0040	30%	+	
Subtotal (95% CI)	0.070	0.004	54.5%		
Hotorogonoity: Tou <sup>2</sup> – 0.0	1: Chiz - 50 10 d	f = 14 (P -		'	
Toot for overall offect: 7 -	7 00 /D = 08.18, u	1 — 14 (F.) 1 \	< 0.00001),1 = 70%		
Test for overall effect. Z =	7.06 (F < 0.0000	0			
2.6.2 Sicknoss absonco	records				
Dei 2000 (2)	0.0045	0.4705	0.00		
Pai 2009 (3)	-0.0843	0.4720	0.3%	1	
Kivimaki 1997	0.0198	0.0847	3.9%		
Alraksinen 2018	0.1044	0.0235	0.8%		
Alavinia 2009	0.1398	0.0401	6.1%	Ē	
Tsai 2011	0.1865	0.124	2.5%		
Rabacow 2014	0.2151	0.1123	2.9%	-	
Niedhammer 1998 (4)	0.2311	0.0647	4.8%	-	
Christensen 2007 (5)	0.2604	0.181	1.4%		
Morikawa 2004 (6)	0.3577	0.1024	3.2%	+	
Niedhammer 1998 (7)	0.3716	0.1119	2.9%		
Morikawa 2004 (8)	0.4088	0.0539	5.3%	-	
Torres Lana 2005	0.4121	0.1805	1.5%		
Pai 2009 (9)	0.4253	0.1825	1.4%		
Christensen 2007 (10)	0.502	0.1589	1.8%		
Roelen 2018	0.6678	0.2435	0.9%		
Subtotal (95% CI)			45.5%	•	
Heterogeneity: Tau <sup>2</sup> = 0.0	1; Chi² = 51.59, d	f = 14 (P ·	< 0.00001); I² = 73%		
Test for overall effect: Z =	5.97 (P < 0.0000)	1)			
Total (95% CI)			100.0%	•	
Heterogeneity: Tau <sup>2</sup> = 0.0	1; Chi <sup>2</sup> = 113.30,	df = 29 (F	< 0.00001); i <sup>2</sup> = 74%		
Test for overall effect: Z =	9.84 (P < 0.0000)	1)		Eavours smoking Eavours non-smok	ing
Test for subgroup differe	nces: Chi <sup>2</sup> = 0.21,	df = 1 (P	= 0.65), I² = 0%	Tavours smoking Tavours non smok	ang
Footnotes				Risk of bias legend	
(1) females				(A) Study aim	
(2) males				(B) Study population definition	
(3) males				(C) Study participation	
(4) females				(D) Participant selection	
(5) males				(E) Study population size	
(6) Japan				(F) Study attrition	
(7) males				(G) Exposure	
(8) United Kingdom				(H) Outcome	
(9) females				(I) Statistical analysis	
(10) females				(J) Study confounding	
()				(=) = may service any any	

Figure S9. Study findings (i.e. effect sizes and risk of bias) stratified by duration of sickness absence (i.e. undefined, short-term sickness absence (<4 weeks) and long-term sickness absence ( $\geq$ 4 weeks)), for articles reporting on the association of smoking and risk of sickness absence. Individual study as well

as	pooled		effec	ts a	are	presented.
				Rate Ratio		Risk of Bias
Study or Subgroup	log[Rate Ratio]	SE	Weight	IV, Random, 95%	CI	ABCDEFGHIJ
2.7.1 Undefined						
Wacker 2013	-0.2904	0.1441	2.0%			
Boles 2004 Kinimaäki 4997	-0.0651	0.2474	0.9%			
Kivimaki 1997 Korlogon 2010	0.0198	0.0847	3.9%			
Alavinia 2009	0.1337	0.2203	1.0% 6.1%	-		
Suwa 2017	0.1398	0.0401	37%	-		
Robroek 2011	0.157	0.0504	5.5%	-		
Serxner 2001	0.174	0.0687	4.6%	-		
Aaviksoo 2013	0.1748	0.1401	2.1%	+		
Kowlessar 2011	0.186	0.0113	7.1%	-		$\bullet \bullet ? \bullet \bullet \bullet ? \bullet \bullet$
Tsai 2011	0.1865	0.124	2.5%	-		
Rabacow 2014	0.2151	0.1123	2.9%	-		
Niedhammer 1998 (1)	0.2311	0.0647	4.8%	-		
R00S 2017 (2) Morrill 2012	0.2495	0.0258	6.7% 5.70			
Merriii 2013 Dooc 2017 (2)	0.2024	0.0473	5.7% 5.0%			
Sindelar 2005	0.3079	0.0333	3.5%	-		
Robroek 2013	0.3202	0.0337	2.3%			
Morikawa 2004 (4)	0.3577	0.1024	3.2%	-+-		
Niedhammer 1998 (5)	0.3716	0.1119	2.9%	-		
Morikawa 2004 (6)	0.4088	0.0539	5.3%	-		
Torres Lana 2005	0.4121	0.1805	1.5%			
Kondo 2006	0.4302	0.3943	0.4%	+		
Bush 1995	0.678	0.084	3.9%	.+		
Subtotal (95% CI)	4.053.0035.4		81.4%	•		
Test for overall effect: Z =	9.20 (P < 0.00001	т= 23 (Р 1)	< 0.00001); i* = 7.3%			
2.7.2 Short term sicknes	s absence (< 4 v	veeks)				
Pai 2009 (7)	-0.0845	0 4725	0.3%			
Pai 2009 (8)	0.4253	0.1825	1.4%			
Subtotal (95% CI)			1.7%	•		
Heterogeneity: Tau <sup>2</sup> = 0.0 Test for overall effect: Z =	0; Chi <sup>2</sup> = 1.01, df: 2.05 (P = 0.04)	= 1 (P = 0	.31); I² = 1%			
2.7.3 Long ferm sicknes	s absence (=> 4	weeks)				
Airaksinen 2018	0 1044	0.0235	6.8%	-		
Christensen 2007 (9)	0.2604	0.181	1.4%			
Christensen 2007 (10)	0.502	0.1589	1.8%			
Roelen 2018	0.6678	0.2435	0.9%			
Subtotal (95% CI)			10.9%	◆		
Heterogeneity: Tau <sup>2</sup> = 0.0 Test for overall effect: Z =	5; Chi² = 11.88, d 2.41 (P = 0.02)	f=3(P=	0.008); I² = 75%			
Total (95% CI)			100.0%			
Heterogeneity: Tau <sup>2</sup> = 0.0	1: Chi≇ = 113 30	df = 29 (F	< 0.00001 $= 74%$	· · · · · · · · · · · · · · · · · · ·		
Test for overall effect: Z =	9.84 (P < 0.0000)	1) 200	0.00001/,1 11/2	0.01 0.1 1	10 100	
Test for subgroup differer	nces: Chi² = 0.89,	df = 2 (P	= 0.64), I <sup>2</sup> = 0%	Favours smoking Favours	s non-smoking	
Footnotes				Risk of bias legend		
(1) females				(A) Study aim		
(2) females				(B) Study population definition	1	
(3) males				(C) Study participation		
(4) Japan				(D) Participant selection		
(5) males				(E) Study population size		
(6) United Kingdom				(F) Study attrition		
(7) males				(G) Exposure		
(o) terriales				(II) Outcome (II) Statistical analysis		
(10) females				(I) Study confounding		
(io)ieinaiea				(e) olday combanding		

Figure S10. Study findings (i.e. effect sizes and risk of bias) stratified by confounding (i.e. correction for gender, age and SEP (socioeconomic position) and no correction for gender, age and SEP), for articles reporting on the association of smoking and risk of sickness absence. Individual study as well as pooled

effects are presented.



Figure S11. Study findings (i.e. effect sizes and risk of bias) stratified by risk of bias (i.e. 8 or more items with low risk of bias or less than 8 items with low risk of bias), for articles reporting on the association of smoking and risk of sickness absence. Individual study as well as pooled effects are presented.

Risk of Bias SE Weight IV, Fixed, 95% CI IV, Fixed, 95% CI Study or Subgroup log[] ABCDEFGHIJ 2.9.1 8 or more items with low risk of bias Wacker 2013 -0.2904 0.1441 0.3% 0.75 [0.56, 0.99] Pai 2009 (1) 0.0% 0.92 [0.36, 2.32] -0.0845 0.4725 Airaksinen 2018 0.1044 0.0235 12.2% 1.11 [1.06, 1.16] 0.1398 0.9% 1.15 [0.97, 1.37] B **A 7 A A** Suwa 2017 0.0879 Alavinia 2009 0.1398 0.0401 4.2% 1.15 [1.06, 1.24] Robroek 2011 0.157 0.0504 2.6% 1.17 [1.06, 1.29] Roos 2017 (2) 0.2495 0.0258 10.1% 1.28 [1.22, 1.35] Christensen 2007 (3) 0.2604 0.181 0.2% 1.30 [0.91, 1.85] 0.2624 0.0473 3.0% Merrill 2013 1.30 [1.18, 1.43] Roos 2017 (4) 0.3079 0.0599 1.9% 1.36 [1.21, 1.53] Morikawa 2004 (5) 0.1024 0.6% 0.3577 1.43 [1.17, 1.75] Morikawa 2004 (6) 0.4088 0.0539 2.3% 1.51 [1.35, 1.67] 1.53 [1.07, 2.19] Pai 2009 (7) 0.4253 0.1825 0.2% Kondo 2006 0.4302 0.3943 0.0% 1.54 [0.71, 3.33] Christensen 2007 (8) 0.502 0.1589 0.3% 1.65 [1.21, 2.26] ----Roelen 2018 0.6678 0.2435 0.1% 1.95 [1.21, 3.14] Bush 1995 0.678 0.084 1.0% 1.97 [1.67, 2.32] ----Subtotal (95% CI) 39.9% 1.23 [1.20, 1.26] Heterogeneity: Chi<sup>2</sup> = 99.11, df = 16 (P < 0.00001); l<sup>2</sup> = 84% Test for overall effect: Z = 16.15 (P < 0.00001) 2.9.2 less than 8 items with low risk of bias 0.1% 0.94 [0.58, 1.52] Boles 2004 -0.0651 0.2474 Kivimäki 1997 0.0198 0.0847 0.9% 1.02 [0.86, 1.20] Karlsson 2010 0.1337 0.2253 0.1% 1.14 [0.74, 1.78] Serxner 2001 0.174 0.0687 1.4% 1.19 [1.04, 1.36] Aaviksoo 2013 0.1748 0.1401 0.3% 1.19 [0.91, 1.57] 0.186 0.0113 52.7% 1.20 [1.18, 1.23] Kowlessar 2011 Tsai 2011 0.1865 0.124 0.4% 1.21 [0.95, 1.54] Rabacow 2014 0.2151 0.1123 0.5% 1.24 [1.00, 1.55] Niedhammer 1998 (9) 0.2311 0.0647 1.6% 1.26 [1.11, 1.43] Sindelar 2005 0.3148 0.0938 0.8% 1.37 [1.14, 1.65] 0.4% Robroek 2013 0.3202 0.1337 1.38 [1.06, 1.79] ? 🗭 ? Niedhammer 1998 (10) 0.3716 0.1119 0.5% 1.45 [1.16, 1.81] **? & & A A A** Torres Lana 2005 0.4121 0.1805 0.2% 1.51 [1.06, 2.15] Subtotal (95% CI) 60.1% 1.21 [1.18, 1.23] Heterogeneity:  $Chi^2 = 12.66$ , df = 12 (P = 0.39);  $I^2 = 5\%$ Test for overall effect: Z = 17.85 (P < 0.00001) Total (95% CI) 100.0% 1.22 [1.20, 1.24] Heterogeneity: Chi<sup>2</sup> = 113.30, df = 29 (P < 0.00001); l<sup>2</sup> = 74% 0.01 0.1 10 100 Test for overall effect: Z = 24.04 (P < 0.00001) Favours [experimental] Favours [control] Test for subgroup differences: Chi<sup>2</sup> = 1.53, df = 1 (P = 0.22), l<sup>2</sup> = 34.5% Footnotes Risk of bias legend (1) males (A) Study aim (2) females (B) Study population definition (3) males (C) Study participation (4) males (D) Participant selection (5) Japan (E) Study population size (6) United Kinadom (F) Study attrition (7) females (G) Exposure (8) females (H) Outcome (9) females (I) Statistical analysis (10) males (J) Study confounding

SE = standard error; CI = confidence interval; IV = Inverse variance.

Figure S12. Study findings (i.e. effect sizes and risk of bias) stratified by year of publication (i.e. published after 2008 or before 2008), for articles reporting on the association of smoking and risk of sickness absence. Individual study as well as pooled effects are presented.

				Risk Ratio	Risk Ratio	Risk of Bias			
Study or Subgroup	log[Risk Ratio]	SE	Weight	IV, Random, 95% CI	IV, Random, 95% Cl	ABCDEFGHIJ			
2.10.1 Published since 2008									
Wacker 2013	-0.2904	0.1441	2.0%	0.75 [0.56, 0.99]	-				
Pai 2009 (1)	-0.0845	0.4725	0.3%	0.92 [0.36, 2.32]					
Airaksinen 2018	0.1044	0.0235	6.8%	1.11 [1.06, 1.16]					
Karisson 2010 Nevinio 2000	0.1337	0.2253	1.0%	1.14 [0.74, 1.78]	Ţ				
Alavinia 2009 Ruwo 2017	0.1398	0.0401	0.1%	1.10[1.00, 1.24]					
Rohroek 2011	0.1550	0.0073	5.5%	1 17 [1 06 1 29]	+				
Aaviksoo 2013	0.1748	0.1401	2.1%	1.19 [0.91, 1.57]					
Kowlessar 2011	0.186	0.0113	7.1%	1.20 [1.18, 1.23]	-				
Tsai 2011	0.1865	0.124	2.5%	1.21 [0.95, 1.54]	+ <del>-</del>				
Rabacow 2014	0.2151	0.1123	2.9%	1.24 [1.00, 1.55]					
Roos 2017 (2)	0.2495	0.0258	6.7%	1.28 [1.22, 1.35]	•				
Merrill 2013	0.2624	0.0473	5.7%	1.30 [1.18, 1.43]	•				
Roos 2017 (3)	0.3079	0.0599	5.0%	1.36 [1.21, 1.53]	+				
Robroek 2013	0.3202	0.1337	2.3%	1.38 [1.06, 1.79]	-				
Pai 2009 (4)	0.4253	0.1825	1.4%	1.53 [1.07, 2.19]					
Roelen 2018 Subtotal (95% CI)	0.66/8	0.2435	0.9% 62.1%	1.95 [1.21, 3.14]					
Hotorogonoity: Tou <sup>2</sup> – 0	00: Chiz - 44.76 d	f - 16 /P	- 0.0002	1.21 [1.10, 1.27]	'				
Tect for overall effect: 7:	00,011 - 44.70,0 - 8 19 /P < 0 0000	1 – 10 (F 1)	- 0.0002;	),1 = 04%					
reactor overall effect. 2.	- 0.13 (1 - 0.0000	·/							
2.10.2 Published before	2008								
Boles 2004	-0.0651	0.2474	0.9%	0.94 [0.58, 1.52]		$\bullet \bullet $			
Kivimäki 1997	0.0198	0.0847	3.9%	1.02 [0.86, 1.20]	+				
Serxner 2001	0.174	0.0687	4.6%	1.19 [1.04, 1.36]	-				
Niedhammer 1998 (5)	0.2311	0.0647	4.8%	1.26 [1.11, 1.43]	+				
Christensen 2007 (6)	0.2604	0.181	1.4%	1.30 [0.91, 1.85]	<u>+-</u>				
Sindelar 2005	0.3148	0.0938	3.5%	1.37 [1.14, 1.65]	+				
Morikawa 2004 (7)	0.3577	0.1024	3.2%	1.43 [1.17, 1.75]	-				
Niednammer 1998 (8)	0.3716	0.1119	2.9%	1.45 [1.16, 1.81]	-				
Morikawa 2004 (9) Tamaa Lana 2005	0.4088	0.0539	5.3%	1.51 [1.35, 1.67]					
Forres Lana 2005 Kondo 2006	0.4121	0.1805	1.5%	1.51 [1.06, 2.15]					
Christenson 2007 (10)	0.4302	0.3943	1 0 %	1.04 [0.71, 3.33]					
Ruch 1995	0.002	0.1008	2.0%	1.00 [1.21, 2.20]	+				
Subtotal (95% CI)	0.070	0.004	37.9%	1.38 [1.23, 1.53]	•				
Heterogeneity: Tau <sup>2</sup> = 0.	03; Chi² = 44.37, d	f=12 (P	< 0.0001)	); I <sup>2</sup> = 73%					
Test for overall effect: Z:	= 5.72 (P < 0.0000	1)	,						
Total (95% CI)			100.0%	1.27 [1.21, 1.33]					
Heterogeneity: Tau <sup>2</sup> = 0.	01; Chi² = 113.30,	df = 29 (F	P < 0.000I	01); I² = 74%					
Test for overall effect: Z:	= 9.84 (P < 0.0000	1)			Favours [smoking] Favours [non-smoking	]			
lest for subgroup differe	ences: Chif = 4.55,	df = 1 (P	= 0.03), 1	*= 78.U%					
Footnotes					Risk of bias legend				
(1) males					(A) Study aim				
(2) females					(B) Study population definition				
(3) males					(C) Study participation				
(4) remaies (5) females					(D) Fancipant selection (E) Study population size				
(6) males					(E) Study population SIZE				
(0) males (7) Janan									
(8) males					(H) Outcome				
(9) United Kingdom					(I) Statistical analysis				
(10) females					(J) Study confounding				

SE = standard error; CI = confidence interval; IV = Inverse variance.