



**Table 2.14. Case-control studies of second-hand tobacco smoke and cancer of the gastrointestinal tract**

Reference, study location and period	Organ site (ICD code)	Characteristics of cases and controls	Exposure assessment	Exposure categories	(Case/ Control) Relative risk (95% CI)*	Adjustment for potential confounders	Comments
Mao <i>et al.</i> (2002) (contd)				Total of residential yrs plus occupational (occup) yrs exposed**	<b>Distal</b>		
				Never regularly exp	(28/76) 1.0 ref		
				1–22	(15/87) 0.5 (0.2–1.1)		
				23–42	(30/93) 0.9 (0.5–1.7)		
				≥ 43	(28/87) 1.0 (0.5–2.0)		
				<i>P</i> for trend	0.58		
				Total	(101/343)		
				Total of residential plus occup smoker yrs exposed***			
				Never regularly exp	(28/76) 1.0 ref		
				1–55	(21/94) 0.6 (0.3–1.3)		
				56–125	(18/83) 0.7 (0.3–1.4)		
				≥ 126	(34/90) 1.1 (0.6–2.0)		
				<i>P</i> for trend	0.66		
				Total	(67/343)		

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Lilla <i>et al.</i> (2006) Germany	Colon (Colorectal cancer) (ICD-10, code C18-C20)	505 cases; 2003–2004. 604 controls; Residents supplied by population registries; Matched on sex, 5-year age groups, and country of residence; No history of colorectal cancer. Both were eligible: ≥ 30 yrs, lived in study region, spoke German, and were physically and mentally able to participate in personal interview of ~1 hour.	In person interview Questionnaire	Never active smokers by <i>NAT2</i> acetylator status <i>Exposed to second-hand tobacco smoke</i> Never (reference) Ever <i>Timing of exposure to second-hand tobacco smoke</i> Never (reference) In child & adulthood <i>Duration of exposure to second-hand tobacco smoke</i> 0 (reference) >0 – 36 >37	<i>NAT2</i> slow acetylators (48/37) 1.0 (91/144) 0.48 (0.28–0.84) (48/37) 1.0 (40/62) 0.48 (0.25–0.91) (48/37) 1.0 (58/81) 0.57 (0.31–1.04) (13/26) 0.37 (0.15–0.91)	Stratified by sex and age in 5-yr age groups; additional adjustment: regular use of NSAIDs, endoscopy of large intestine, family history of colorectal cancer, average daily alcohol consumption, frequency of red meat consumption, education level, and BMI	Risk associated with exposure to second-hand tobacco smoke may only be relevant among genetically susceptible individuals.

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Lilla <i>et al.</i> (2006) (contd.)				<i>Exposed to second-hand tobacco smoke</i>	NAT2 fast acetylators		
				Never (reference)	(25/33) 1.0		
				Ever	(73/73) 1.55 (0.77–3.14)		
				<i>Timing of exposure to second-hand tobacco smoke</i>			
				Never (reference)	(25/33) 1.0		
				In child & adulthood	(42/30) 2.58 (1.13–5.88)		
				<i>Duration of exposure to second-hand tobacco smoke</i>			
				0 (reference)	(25/33) 1.0		
				>0 – 36	(47/37) 2.26 (1.03–4.93)		
				>37	(14/12) 2.41 (0.81–7.16)		
				<i>Exposure to second-hand tobacco smoke</i>	Overall		
				Never (reference)	1.0		
				Ever	0.79 (0.53–1.20)		
				<i>Timing of exposure to second-hand tobacco smoke</i>			
				Never (reference)	1.0		
				In child & adulthood	0.96 (0.60–1.55)		
				<i>Duration of exposure to second-hand tobacco smoke</i>			
				0 (reference)	1.0		
				>0 – 36	0.98 (0.62–1.53)		
				>37	0.75 (0.40–1.42)		

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Duan <i>et al.</i> (2009) USA	Oesophageal and Stomach	1716 eligible patients with newly diagnosed first incident oesophageal adenocarcinoma (EA), gastric cardia adenocarcinoma (GCA), or distal gastric adenocarcinoma (DGA); 1992–1997; Los Angeles County Cancer Surveillance Program Matched individually on sex, race and age (5 yrs); 1:2 case to control	In person interviews Structured questionnaire	<i>Lifetime exposure to smoke (active/ second-hand tobacco smoke)</i> No active, no second-hand tobacco smoke No active, exposed to second-hand tobacco smoke in childhood only No active, any exposure to second-hand tobacco smoke in adulthood Ex-smoker <i>Duration of second-hand tobacco smoke exposure among never smokers Adulthood</i> No adult exposure < 12 person-exp yrs ≥ 12 person-exp yrs P for trend  No active, no exposure to second-hand tobacco smoke No active, exposed to second-hand tobacco smoke in childhood only No active, any exposure to second-hand tobacco smoke in adulthood Ex-smoker	<b>Adenocarcinoma of the oesophagus</b> (12/122) – (6/151) 0.48 (0.17–1.42) (22/207) 1.49 (0.65–3.40) (107/639) 1.55 (0.76–3.19)  (18/272) – (10/112) 1.54 (0.64–3.72) (10/95) 1.77 (0.73–4.32) 0.43 <b>Adenocarcinoma of the cardia of the stomach</b> (17/122) – (20/151) 0.89 (0.44–1.79) (32/207) 0.86 (0.44–1.67) (127/639) 1.07 (0.61–1.86)	Age, sex, body mass index at reference age, and ethnicity (others v non-Hispanic white)	

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Duan <i>et al.</i> (2009) (contd.)				<i>Duration of passive smoke exposure among never smokers</i> <i>Adulthood</i>			
				No adult exposure	(37/273) –		
				< 12 person-exp yrs	(11/112) 0.55 (0.25–1.20)		
				≥ 12 person-exp yrs	(21/95) 1.08 (0.54–2.16)		
				<i>P</i> for trend	0.60		
					<b>Adenocarcinoma of the distal stomach</b>		
				No active, no exposure to second-hand tobacco smoke	(38/122) –		
				No active, exposure to second-hand tobacco smoke in childhood only	(34/151) 0.85 (0.48–1.53)		
				No active, any exposure to second-hand tobacco smoke in adulthood	(85/207) 1.30 (0.79–2.14)		
				Ex-smoker	(177/639) 1.28 (0.82–2.01)		
				<i>Duration of exposure to second-hand tobacco smoke among never smokers</i> <i>Adulthood</i>			
				No adult exposure	(72/273) –		
				< 12 person-exp yrs	(34/112) 1.15 (0.67–1.97)		
				≥ 12 person-exp yrs	(51/95) 1.54 (0.92–2.58)		
				<i>P</i> for trend	0.03		

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Verla-Tebit <i>et al.</i> (2009)	Cancer of the colorectum	540 cases (252 never smokers); $\geq 30$ yrs; 2003–2004; German speaking; Residence of study area. 614 controls (292 never smokers); Population registries; Matched sex, county of residence, and 5-yr age group	Personal interviews	<p><i>Exposure to second-hand tobacco smoke during lifetime</i></p> <p>No exposure to second-hand tobacco smoke (ref)</p> <p>Ever exposure to second-hand tobacco smoke</p> <p><i>Total duration of exposure (yrs)</i></p> <p>&lt; 36</p> <p>36–53</p> <p>&gt; 53</p> <p><i>P for trend</i></p> <p>Never exposure to second-hand tobacco smoke (ref)</p> <p>Ever exposure to second-hand tobacco smoke</p> <p><i>Total duration of exposure (yrs)</i></p> <p>&lt; 36</p> <p>36–53</p> <p>&gt; 53</p> <p><i>P for trend</i></p> <p>Never exposure to second-hand tobacco smoke (ref)</p> <p>Ever exposure to second-hand tobacco smoke</p> <p><i>Total duration of exposure (yrs)</i></p> <p>&lt; 36</p> <p>36–53</p> <p>&gt; 53</p> <p><i>P for trend</i></p>	<p><i>All patients (n = 544)</i></p> <p>(74/71) 1.00</p> <p>(178/221) 0.81 (0.54–1.23)</p> <p>(115/161) 0.70 (0.45–1.08)</p> <p>(36/39) 0.91 (0.50–1.66)</p> <p>(25/21) 1.10 (0.54–2.26)</p> <p>0.58</p> <p><i>Men (n = 218)</i></p> <p>(33/29) 1.00</p> <p>(71/85) 0.59 (0.31–1.15)</p> <p>(47/61) 0.51 (0.25–1.03)</p> <p>(17/13) 0.96 (0.37–2.50)</p> <p>(6/11) 0.35 (0.09–1.34)</p> <p>0.39</p> <p><i>Women (n = 326)</i></p> <p>(41/42) 1.00</p> <p>(107/136) 1.01 (0.56–1.80)</p> <p>(68/100) 0.85 (0.47–1.56)</p> <p>(19/26) 0.87 (0.37–2.06)</p> <p>(19/10) 1.98 (0.75–5.25)</p> <p>0.14</p>	Stratified by 5-year age groups and adjusted for sex, level of education, family history of colorectal cancer in first degree relatives, BMI, fruits and vegetable intake, red meat consumption, nonsteroidal anti-inflammatory drug use, alcohol consumption, physical activity, and history of colorectal endoscopy	Found no evidence of an increased risk of cancer of the colorectum following exposure to exposure to second-hand tobacco smoke overall, in childhood or at work. For spousal exposure, however, study found a significant risk increase for women currently exposed (OR: 3.54 (1.03–12.15) and for women exposure to > 23 pack-years of spousal smoking (3.02 (0.99–9.28)). Findings do not indicate a major impact of exposure to second-hand tobacco smoke on cancer of the colorectum risk but suggest risk of cancer of the colorectum may be increased following spousal exposure.