

**Table 2.88 Case-control studies of Bidi smoking and cancer**

Reference Country and years of study	No of cases	No of controls	Smoking category Bidi smoking	Relative risk (95% CI)	Comments
<b>Lung</b>					
Jayalakshmy <i>et al.</i> (2008)			<b>(Cigarette smokers not excluded)</b>		Adjusted for age, religion and education
India	27	31324	Never	1.0	p for trend: <0.001
1997-2004	29	5970	Former	2.6 (1.5-4.5)	
	143	25446	Current	3.9 (2.6-6.0)	
			<b>Duration of bidi smoking</b>		Current smokers of bidi analysed
	14	19045	Never	1.0	p for trend: <0.001
	15	4087	1-29	3.3 (1.6-7.0)	
	35	3411	30-44	4.1 (2.1-7.8)	
	15	1916	45+	4.1 (1.8-9.0)	
			<b>Number of bidis/day</b>		Current smokers of bidi analysed
	14	19045	Never	1.0	p for trend: <0.001
	2	756	1-4 (sticks)	1.7 (0.4-7.8)	
	23	2806	5-14	4.7 (2.3-9.4)	
	20	2449	15-24	4.9 (2.4-10.0)	
	15	1550	25+	5.1 (2.4-10.9)	
			<b>Age started smoking (yrs)</b>		p for trend: <0.001
	12	1549	1-17	4.1 (1.8-9.1)	
	31	3398	18-22	5.4 (2.8-10.4)	
	17	2645	23+	3.8 (1.9-7.9)	
	14	19045	Never	1.0	
			<b>Time since quitting bidi smoking</b>		
	143	25446	Current bidi smoker	1.0	
			<b>Years since quitting</b>		
	14	2322	0-4	0.9 (0.5-1.5)	
	10	1517	5-9	0.9 (0.5-1.7)	
	5	2031	10+	0.3 (0.1-0.8)	
	27	31324	Never	0.3 (0.2-0.4)	
Gajalakshmi <i>et al.</i> (2003)			<b>Duration</b>		Adjusted for age, centre, educational level, alcohol and chewing tobacco
India	87	1717	Never smokers	1.0	p for trend: <0.01
1993-1999	3	54	≤10	1.6 (0.46-5.34)	
	16	95	10.1-20	3.4 (1.80-6.57)	
	40	103	20.1-30	5.6 (3.47-8.93)	
	145	161	>30	6.5 (4.38-9.50)	
			<b>≤10 bidis per day &amp; Duration</b>		
	6	97	≤15yrs	1.6 (0.66-3.87)	
	17	85	15.1-25 yrs	3.5 (1.91-6.37)	
	17	75	25.1-35 yrs	2.6 (1.45-4.77)	
	39	75	>35yrs	4.2 (2.60-6.91)	

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Gajalakshmi <i>et al.</i> (2003) (contd)			<b>&gt;10 bidis per day &amp; Duration</b>		Adjusted for age, centre, educational level, alcohol and chewing tobacco
	14	41	≤15yrs	6.2 (3.02–12.5)	
	40	91	15.1-25 yrs	6.3 (3.88–12.2)	
	125	95	25.1-35 yrs	12.8 (8.7–19.0)	
	180	105	>35yrs	11.5 (7.8–17.0)	
			<b>Pack years</b>		p for trend: <0.01
	87	1717	Never smokers	1.0	
	6	137	≤2	1.0 (0.39–2.27)	
	47	139	2.1-5	4.1 (2.62–6.40)	
	111	109	5.1-12	9.9 (6.56–14.8)	
	40	28	>12	10.7 (5.82–19.6)	
			<b>Years since quitting bidi Smoking</b>		
	204	413	Current smokers	1.0	
	19	36	≤3	0.81 (0.42–1.56)	
	17	39	3.1-10	0.64 (0.33–1.20)	
	1	6	10.1-15	0.19 (0.02–1.77)	
	3	16	>15	0.42 (0.12–1.52)	
	87	1717	Never smokers	0.19 (0.14–0.26)	
<b>Oral</b>					
Rahman <i>et al.</i> (2003) India, Pakistan & Srilanka			Never smokers	1.0	Meta analysis based on 10 studies from India, and one each from Sri Lanka and Pakistan
			Bidi smokers	3.1 (95%CI: 2.0–5.0)	
Muwonge <i>et al.</i> (2008) Trivandrum, India 1996-2004	40	129	Bidi only	1.9 (1.1–3.2)	
	44	211	Cigarettes and bidi	1.0 (0.6–1.7)	
Znaor <i>et al.</i> (2003) India 1993-1999	474	548	Bidi only	2.2 (1.75–2.63)	Adjusted for age, centre, educational level, alcohol and chewing tobacco
	366	357	Cigarettes and bidi	1.5 (1.18–1.88)	
Subapriya <i>et al.</i> (2007) India 1991-2003	268	345	Non-smokers		Risk estimates adjusted for age, sex, literacy, occupation, oral hygiene and alcohol drinking. 95%CI not available
	84	22	Bidi smokers	4.63	
	36	21	Cigarette smokers	2.33	
			Frequency (g/day)		
	268	345	Non-smokers		
			Smokers		Under frequency and duration: smokers includes bidi and cigarette smokers
	31	26	<5 g	1.62	
	89	17	≥5 g	6.11	

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Subapriya <i>et al.</i> (2007) (contd)	268	345	Duration (years)		Risk estimates adjusted for age, sex, literacy, occupation, oral hygiene and alcohol drinking. 95%CI not available
	11	7	Non-smokers		
	16	8	Smokers		
	20	8	<10	2.13	
	25	9	11-20	2.47	
	48	11	21-30	3.25	
			31-40	3.56	
			>40-48	3.89	
<b>Pharynx</b>					
Znaor <i>et al.</i> (2003)	248	548	Bidi only	4.7 (3.50–6.27)	Adjusted for age, centre, educational level, alcohol and chewing tobacco
India, 1993-1999	184	357	Cigarettes and bidi	3.6 (2.55–4.98)	
<b>Oesophagus</b>					
Znaor <i>et al.</i> (2003)	186	548	Bidi only	3.3 (2.45–4.19)	Adjusted for age, centre, educational level, alcohol and chewing tobacco
India, 1993-99	155	357	Cigarettes and bidi	2.7 (1.95–3.8)	
<b>Hypopharynx</b>					
Sapkota <i>et al.</i> (2007)			<i>Smoking product</i>		Adjusted for center, age, SES, alcohol consumption, tobacco snuffing and tobacco chewing
India	149	457	Never	1.0	
2001-2004	48	104	Cigarette	3.82 (2.32–6.29)	
	278	113	Bidi	6.80 (4.64–9.97)	
	23	33	Cigarette & bidi	4.74 (2.42–9.29)	
	13	11	Other	4.21 (1.69–10.47)	
			<i>Duration of bidi smoking</i>		
	151	457	0 years	1.0	
	26	16	1-15 years	6.35 (3.02–13.33)	
	70	43	>15-30yrs	5.51 (3.31–9.16)	
	182	54	>30years	9.22 (5.78–14.73)	
			<i>Frequency of bidi smoking</i>		
	151	457	0	1.0	
	55	62	1-10 per day	2.83 (1.73–4.63)	
	73	25	>10-20 per day	9.45 (5.32–16.78)	
	150	26	>20 per day	17.13 (9.97–29.44)	

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Reference Country and years of study	No of cases	No of controls	Smoking category Bidi smoking	Relative risk (95% CI)	Comments
<b>Larynx</b>					
Sapkota <i>et al.</i> (2007) India 2001-2004			<b>Glottis</b>		Adjusted for center, age, SES, alcohol consumption, tobacco snuffing and tobacco chewing
			<b>Smoking product</b>		
	37	457	Never	1.0	
	37	104	Cigarette	5.74 (3.20–10.31)	
	87	113	Bidi	5.32 (3.18–8.90)	
	11	33	Cigarette & bidi	5.42 (2.37–12.39)	
	6	11	Other	3.47 (1.14–10.60)	
			<b>Duration of bidi smoking</b>		
	37	457	0 years	1.0	
	6	16	1-15 years	3.37 (1.15–9.90)	
	19	43	>15-30yrs	3.96 (1.91–8.19)	
	62	54	>30years	7.76 (4.16–14.47)	
			<b>Frequency of bidi smoking</b>		
	37	457	0	1.0	
	15	62	1-10 per day	2.01 (0.96–4.20)	
	18	25	>10-20 per day	5.31 (2.42–11.63)	
	54	26	>20 per day	14.59 (7.47–28.50)	
			<b>Supraglottis</b>		
		457	<b>Smoking product</b>		
	457	104	Never	1.0	
	104	113	Cigarette	2.14(0.63-7.30)	
	113	33	Bidi	7.53(3.84-14.74)	
	33	11	Cigarette & bidi	15.92(5.46-46.45)	
	11		Other	4.24(0.81-22.20)	
			<b>Duration of bidi smoking</b>		
	21	457	0 years	1.0	
	5	16	1-15 years	5.09(1.43-18.16)	
	19	43	>15-30yrs	6.04(2.54-14.35)	
	59	54	>30years	11.04(5.10-23.91)	
			<b>Frequency of bidi smoking</b>		
	21	457	0	1.0	
	14	62	1-10 per day	3.07 (1.29–7.33)	
	16	25	>10-20 per day	7.25 (2.77–18.04)	
	53	26	>20 per day	20.31 (9.10–45.31)	

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Sapkota <i>et al.</i> 2007 (contd)			<b>Larynx, other Smoking product</b>		Adjusted for center, age, SES, alcohol consumption, tobacco snuffing and tobacco chewing
	39	457	Never	1.0	
	20	104	Cigarette	5.06 (2.50–10.26)	
	129	113	Bidi	9.61 (5.65–16.35)	
	17	33	Cigarette & bidi	9.52 (4.15–21.85)	
	7	11	Other	5.85 (1.85–18.50)	
			<b>Duration of bidi smoking</b>		
	40	457	0 years	1.0	
	2	16	1-15 years	1.54 (0.32–7.53)	
	32	43	>15-30yrs	7.16 (3.60–14.23)	
	95	54	>30years	12.99 (7.14–23.61)	
			<b>Frequency of bidi smoking</b>		
	40	457	0	1.0	
	20	62	1-10 per day	2.82 (1.40–5.67)	
	38	25	>10-20 per day	11.94 (5.74–24.84)	
	71	26	>20 per day	24.71 (12.56–48.61)	
<b>Stomach</b>					
Rao <i>et al.</i> (2002) India, 1988-92	137 33	1780 403	Non-bidi smokers Bidi smokers	1.0 0.8 (0.5–1.2)	Univariate analysis
Phukan <i>et al.</i> (2005) Mizoram, India Aug. 2001 - Aug. 2004	Hospital-based case-control study with 329 (253 men and 76 women) histologically confirmed cases. Cases with advanced disease and recurrent cancer were excluded. Interviewed using pre-tested questionnaire.	Controls were selected from hospital patients suffering from non-malignant disease. Matched with cases for age (±5years), sex and ethnicity. Two controls were selected for each case. Interviewed using pre-tested questionnaire.	Never tobacco/ Betal users Meiziol users	1.0 2.2 (1.6–3.1)	Adjusted for education, occupation, income group, smoking, using of tuibur (tobacco smoke-infused water) and alcohol drinking habits Reference non-smokers