



Supplementary file A

Table S1: Literature reporting puffing parameters in chronological order since 2000.

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Author	Year	Sort	n	Gender	Age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
Buchhalter <i>et al</i> [1]	2000	own brand (9.5 mg tar, 0.73 mg nicotine)	10	♂/♀	23.2	3.4	15.3	4.1	38.4	11.7	1.2	0.4	32.0		35.0	17.9	10.3	2.1	395.5		6.1	4.0	1.2	CRSSPT	
Djordjevic <i>et al</i> [2]	2000	own brand (8.5 mg tar, 0.7 mg nicotine)	56	♂/♀	34.1	CI 31.3-37.2	14.9	CI 13.1-16.9	48.6	CI 45.2-25.3	1.5	CI 1.4-1.7	32.4		21.3	CI 19-23.8	12.7	CI 11.8-13.6	615.0	CI 566-668	9.5	3.3	CI 2.3-4.8	Tobacco Smoke Inhalation Testing System	
		own brand (15.4 mg tar, 1.11 mg nicotine)	77	♂/♀	34.7	CI 32.5-37.1	15.9	CI 14.3-17.8	44.1	CI 40.8-46.8	1.5	CI 1.4-1.6	29.4		18.5	CI 16.5-20.6	12.1	CI 11.3-12.9	523.0	CI 487-561	8.2	3.8	CI 2.7-5.3	Tobacco Smoke Inhalation Testing System	
Breland <i>et al</i> [3]	2002	own brand (10.2 mg tar, 0.8 mg nicotine)	20	♂/♀	21.6	SEM 1.1	18.9	SEM 0.7	49.8	SEM 3.3	1.7	SEM 0.1	29.3				8		398.4		7.5	5.6	SEM 0.3	Tobacco Smoke Inhalation Testing System	Fixed puff count
Breland <i>et al</i> [4]	2002	own brand (9.4 mg tar, 0.73 mg nicotine)	18	♂/♀	25.8	6.0	20.7	4.7	56.5	11.2	1.8	0.1	31.4		33.9	23.6	8		452.0		9.4	5.3	1.6	Tobacco Smoke Inhalation Testing System	Fixed puff count
Dixon <i>et al</i> [5]	2003	test cigarette (9.5 mg tar, 0.77 mg nicotine)	13						55.4	12.4	1.8	0.8	31.7		20.9	4.4	16.0	2.6	877.0	197.0				Orifice-type holder/flowmeter (design of Creighton <i>et al.</i> 1978)	
		test cigarette (8.8 mg tar, 0.48 mg nicotine)	13						56.7	11.6	1.8	0.8	31.5		20.8	3.6	16.1	3.0	890.0	152.0				Orifice-type holder/flowmeter (design of Creighton <i>et al.</i> 1978)	
		test cigarette (8.7 mg tar, 0.81 mg nicotine)	13						53.6	13.3	1.7	0.8	31.7		21.4	5.3	14.4	2.3	755.0	166.0				Orifice-type holder/flowmeter (design of Creighton <i>et al.</i> 1978)	
		test cigarette 8.1mg tar, 0.10 mg nicotine)	13						55.6	11.5	1.8	0.7	31.4		21.1	4.5	14.4	2.3	766.0	141.0				Orifice-type holder/flowmeter (design of Creighton <i>et al.</i> 1978)	
		test cigarette (7.7 mg tar, 0.22 mg nicotine)	13						55.8	13.0	1.8	0.8	30.3		20.0	3.7	15.6	3.3	870.0	136.0				Orifice-type holder/flowmeter (design of Creighton <i>et al.</i> 1978)	
Lee <i>et al</i> [6]	2003	own brand (16.7 mg tar, 1.2 mg nicotine)	7	♂/♀	37.0	25-44	25.0	10-38	30.8	SE 3.5	0.9	SE 0.1	44.6	SE 3.4	19.9	SE 3.5	9.3		284.9		7.1	6.8	4-10	CRSSPT	8, 8, 11, 10 puffs
		own brand (12.8 mg tar, 1.0 mg nicotine)	10	♂/♀	24.5	20-37	25.0	17-40	45.1	SE 4.9	1.2	SE 0.1	54.4	SE 4.8	23.2	SE 3.0	10.0		451.0		11.3	6.0	3-9	CRSSPT	
Aung <i>et al</i> [7]	2004	own brand	56	♂/♀	15.4	1.3	19.6	8.93	38.1	14.5	1.1	0.4	52.0	19.3	15.5	8.6	14.0	3.9	534.0		10.5	7.4	1.4	CRSSPT	Current non-marijuana-smoking teens
Dixon ^s	2004	10 mg tar, 1 mg nicotine	100	♂/♀					46.2		1.9		24.2		24.7		12.6		558.0						
		4.8 mg tar, 0.5 mg nicotine	100	♂/♀					58.6		1.9		31.7		21.7		16.6		939.0						
		2.8 mg tar, 0.3 mg nicotine	100	♂/♀					57.6		1.9		30.6		19.7		15.0		844.0						
		1.2 mg tar, 0.1 mg nicotine	100	♂/♀					63.4		1.9		33.2		18.7		18.8		1135.0						
Dixon ^s	2004	5.6 mg tar, 0.5 mg nicotine	50	♂/♀					52.8		1.7		30.3				12.5		644.0						
		1 mg tar, 0.1 mg nicotine	50	♂/♀					63.2		1.7		36.3				15.1		901.0						
Hughes <i>et al</i> [8]	2004	own brand (Light, ultralight, regular)	34	♂/♀	48.0		30.0	SEM 2	50.0	SEM 2							12.7	SEM 0.7	612.0	SEM 34	18.4	6.4	2.0	CRSSPT	

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Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
		Omni light (12 mg tar, 0.8 mg nicotine) or Omni Full flavor King/100's (15 mg tar, 1.0 mg nicotine)	34	♂/♀	48.0		31.0	SEM 2	49.0	SEM 2							11.6	SEM 0.5	547.0	SEM 25	17.0	6.4	2.0	CRSSPT	
Lee <i>et al</i> [9]	2004	own brand (14.5 mg tar, 1.1 mg nicotine)	10	♂/♀	30.3	19-46	21.3	13-30	60.1	4.0	1.1		57.1	3.5			11.5	0.7	691.2		14.7	5.4	3-9	CRSSPT	
Strasser <i>et al</i> [10]	2004	own brand (mean 0.93mg nicotine)	113	♂/♀	45.8	10.7	21.2	7.8	54.8	16.9	1.6	0.5	34.3	8.2	24.8	11.9	12.7	4.0	675.7	244.7	14.3	5.5	2.1	CRSSPT	
Wood <i>et al</i> [11]	2004	own brand	24	♀	16.3	1.5	15.0	1-25	38.5	12.2	1.1	0.3	35.0		24.1	9.9	12.7	6.2	504.4	312.1	7.6	4.2	1.6	CRSSPT	
		own brand	25	♂	16.4	1.4	15.0	1-25	45.8	14.6	1.2	0.3	38.2		19.1	10.9	15.6	6.1	729.0	393.5	10.9	4.6	1.7	CRSSPT	
Zimmerman <i>et al</i> [12]	2004	own brand	92	♂/♀	15.2	1.5			38.2	12.5	1.1	0.4	51.1	16.0	16.8	10.9								CRSSPT	volunteers cessation trial NIDA
Hammond <i>et al</i> [13]	2005	own brand (10-14 mg tar)	58	♂/♀	37.1	11.1	19.3	8.0	54.2	10.3	1.5	0.2	38.1	5.6	33.5	17.6	11.3	3.4	612.0	195.7	11.8			CRSSPT	trial 1
		own brand (10-14 mg tar)	58	♂/♀	37.1	11.1	19.3	8.0	52.3	12.4	1.4	0.3	37.9	6.1	35.6	18.4	11.1	3.3	580.5	206.9	11.2			CRSSPT	trial 2
		Matinee Extra Mild (4 mg tar, 0.8 mg nicotine)	24	♂/♀	37.1	11.1	19.3	8.0	58.3	16.1							13.4		779.2	331.0	15.0			CRSSPT	trial 3
Hitsman <i>et al</i> [14]	2005	own brand (mean 0.8 mg nicotine)	8	♂/♀	35.5	16.9	18.8	2.3			2.4	0.7			36.8	17.2	10.8	3.6				5.6	1.7	Videotaping + handtiming	
Strasser <i>et al</i> [15]	2005	Marlboro Light 100 HP (10 mg tar, 0.8 mg nicotine)	12	♂/♀	21.6	4.5	17.5	12.5	63.4	SE 8.4	1.6	SE 0.2	42.5	SE 3.2	45		8		507.2		8.9			CRSS	Study 1, fixed puff count and IPI, unblocked
		Carlton 100 HP (1 mg tar, 0.1 mg nicotine)	12	♂/♀	21.6	4.5	18.0	12.5	85.1	SE 10.9	2.0	SE 0.3	44.5	SE 2.8	45		8		680.8		12.3			CRSS	Study 1, fixed puff count and IPI, unblocked
		Carlton 100 HP (1 mg tar, 0.1 mg nicotine)	12	♂	41.6	15.3	19.4	9.5	83.9		1.9		62.2		45		8		671.5		13.0	4.0	2.6	CRSS	Study 2, fixed puff count and IPI, unblocked, calculated mean (n=3)
Tidey <i>et al</i> [16]	2005	own brand (mean 1.1 mg nicotine)	20	♂/♀	51.0	12.0	29.0	11	47.5	10.4	1.3	0.2	36.5		42.0	21.5	8.9	2.3	429.0	159.0	12.4	7.4	1.3	CRSS	
Breland <i>et al</i> [17]	2006	own brand (9.89 mg tar, 0.74 mg nicotine)	35	♂/♀	22.4	CI 21.19-23.55	21.0	CI 3.46-5.55	51.0	CI 45.70-56.24	1.4	CI 1.24-1.52	36.9		30.7	CI 26.48-34.99	10.0	CI 8.85-11.21	511.2		10.8			CRSS	

Table S1: Literature reporting puffing parameters in chronological order since 2000

Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
Franken <i>et al</i> [18]	2006	own brand	66	♂/♀	15.1	1.3	19.0	8.4	36.0	13.5	1.1	0.4	35.6	10.6	18.2	10.6	5		180.0		3420.0	7.2	1.3	CRess	Fixed puff count
Hammond <i>et al</i> [19]	2006	own brand (9-15 mg tar)	51	♂/♀	37.1		>5		53.3	11.9	1.4	0.3	38.6	5.9	33.2	15.8	11.5	3.6	602.6	195.8	3013.0				Same data as Hammond <i>et al</i> [13]
		Matinee Extra Mild (4 mg tar, 0.4 mg nicotine)	21	♂/♀	37.1		>5		60.7	15.6	1.6	0.4	40.8	8.4	30.5	15.4	13.4	5.3	802.4	346.2	4012.0				Same data as Hammond <i>et al</i> [13]
Kassel <i>et al</i> [20]	2007	Research cigarette (15.9 mg tar, 1.14 mg nicotine)	16	♂/♀	17.5	1.1	3.4	1.2	45.4	22.2	1.1	0.4	57.2	18.9	24.2	12.9	15.1	6.3	713.1	461.8	2.4	2.2	1.4	CRess	
		Research cigarette (17.9 mg tar, 0.06 mg nicotine)	19	♂/♀	17.5	1.1	3.8	2	40.1	18.7	1.0	0.4	53.4	19.0	23.0	13.2	23.2	8.9	988.8	547.2	3.8	2.1	1.4	CRess	
Melikian <i>et al</i> [21]	2007	own brand (10.1 mg tar, 1.92 mg nicotine)	129	♀	33.1	CI 31.2-35	15.9	CI 14.7-17.1	37.6		1.3		28.3		20.4		13.5		507.8		8.1	4.1	CI 3.65-4.62	puff analyzer [22]	
		own brand (12.4 mg tar, 2.2 mg nicotine)	128	♂	35.0	CI 33.3-36.9	16.8	CI 15.5-18.2	45.8		1.5		30.9		20.7		12.0		553.0		9.3	4.6	CI 4.12-5.06	puff analyzer [22]	
Strasser <i>et al</i> [23]	2007	own brand (mean 12.9 mg tar, 0.94 mg nicotine)	50	♂/♀	44.5	12.1	21.3	8.1	60.5	CI 55.2-65.7	1.8	CI 1.6-1.9	35.5	CI 22.3-37.8	21.6	CI 19.1-24.1	14.3	CI 12.8-15.7	832.0	CI 737-926	17.7	5.5	1.9	CRess	
		Quest (10 mg tar, 0.6 mg nicotine)	50	♂/♀	44.5	12.1	21.3	8.1	58.1	CI 53.3-62.8	1.8	CI 1.6-1.9	34.5	CI 32.0-37.0	21.6	CI 19.0-24.2	9.8	CI 9-10.8	540.3	CI 500-580	11.5	5.5	1.9	CRess	
		Quest (10 mg tar, 0.3 mg nicotine)	50	♂/♀	44.5	12.1	21.3	8.1	55.9	CI 51.0-60.8	1.7	CI 1.5-1.8	34.4	CI 31.9-37.0	19.6	CI 16.9-22.3	9.9	CI 8.9-10.9	518.1	CI 478-558	11.0	5.5	1.9	CRess	
		Quest (10 mg tar, 0.05 mg nicotine)	50	♂/♀	44.5	12.1	21.3	8.1	59.4	CI 54.6-64.3	1.8	CI 1.6-1.9	35.1	CI 32.5-37.8	18.6	CI 15.7-21.6	10.0	CI 9.1-10.9	570.5	CI 527-614	12.2	5.5	1.9	CRess	
Strasser <i>et al</i> [24]	2007	own brand	119	♂/♀	45.8	10.8	21.2	8.1	55.1	16.9							12.7	4.0	669.6	243.1	14.2	5.5	2.1	CRess	
Attwood <i>et al</i> [25]	2008	own brand	55	♂/♀	22.0	4.0	11.0	5	49.0	12.0	1.6	0.4	31.6		14.0	5.0	17.0	6.0	833.0		9.2	4.0	2.0	CRess	
Collins <i>et al</i> [26]	2008	own brand	67	♂/♀	15.3	1.3	>10		38.7		1.1		48.1				6		232.1		2.3	>5		CRess	Fixed puff count
Rees <i>et al</i> [27]	2008	Marlboro Light (11 mg tar, 0.8 mg nicotine)	17	♂/♀	27.7	CI 24.3-31.0	15.7	CI 12.0-19.3	50.7	19.6	1.4	0.5	37.6		32.1	11.9	11.4	3.0	578.0		9.1	3.9	CI 2.5-5.4	CRess	Supervised - Tampa group
		Marlboro Light (11 mg tar, 0.8 mg nicotine)	17	♂/♀	27.7	CI 24.3-31.0	15.7	CI 12.0-19.3	51.2	17.3	1.4	0.5	35.8		37.3	22.1	11.9	4.0	609.3		9.6	3.9	CI 2.5-5.4	CRess	Unsupervised - Tampa group

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Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
		Marlboro Light (11 mg tar, 0.8 mg nicotine)	15	♂/♀	27.8	CI 35.5-32.1	15.9	CI 9.5-22.2	47.4	16.9	1.3	0.4	36.7		24.8	11.5	13.1	4.8	620.9		9.9	4.4	CI 3.0-5.8	CReSS	Supervised - Salt Lake City group
		Marlboro Light (11 mg tar, 0.8 mg nicotine)	15	♂/♀	27.8	CI 35.5-32.1	15.9	CI 9.5-22.2	41.0	18.0	1.3	0.5	32.3		26.8	10.4	11.9	4.7	487.9		7.8	4.4	CI 3.0-5.8	CReSS	Unsupervised - Salt Lake City group
		Marlboro ultraLight (6 mg tar, 0.5 mg nicotine)	17	♂/♀	27.7	CI 24.3-31.0	15.7	CI 12.0-19.3	51.4	19.0	1.3	0.4	38.9		33.0	14.9	11.3	2.6	580.8		9.1	3.9	CI 2.5-5.4	CReSS	Supervised - Tampa group
		Marlboro ultraLight (6 mg tar, 0.5 mg nicotine)	17	♂/♀	27.7	CI 24.3-31.0	15.7	CI 12.0-19.3	49.9	18.3	1.4	0.5	35.6		35.1	15.3	10.5	2.6	524.0		8.2	3.9	CI 2.5-5.4	CReSS	Unsupervised - Tampa group
		Marlboro ultraLight (6 mg tar, 0.5 mg nicotine)	15	♂/♀	27.8	CI 35.5-32.1	15.9	CI 9.5-22.2	50.1	15.6	1.4	0.4	36.3		21.8	10.4	13.9	5.6	696.4		11.1	4.4	CI 3.0-5.8	CReSS	Supervised - Salt Lake City group
		Marlboro ultraLight (6 mg tar, 0.5 mg nicotine)	15	♂/♀	27.8	CI 35.5-32.1	15.9	CI 9.5-22.2	52.2	15.7	1.5	0.5	34.8		24.7	12.3	12.1	4.6	631.6		10.0	4.4	CI 3.0-5.8	CReSS	Unsupervised - Salt Lake City group
		Marlboro UltraSmooth (5 mg tar, 0.4 mg nicotine)	17	♂/♀	27.7	CI 24.3-31.0	15.7	CI 12.0-19.3	54.2	19.4	1.4	0.4	39.0		28.4	8.4	10.2	2.9	552.8		8.7	3.9	CI 2.5-5.4	CReSS	Activated carbon in filter - Supervised - Tampa group
		Marlboro UltraSmooth (5 mg tar, 0.4 mg nicotine)	17	♂/♀	27.7	CI 24.3-31.0	15.7	CI 12.0-19.3	53.5	19.2	1.4	0.5	37.4		33.6	15.8	9.3	2.4	497.6		7.8	3.9	CI 2.5-5.4	CReSS	Activated carbon in filter - Unsupervised - Tampa group
		Marlboro UltraSmooth (5 mg tar, 0.4 mg nicotine)	15	♂/♀	27.8	CI 35.5-32.1	15.9	CI 9.5-22.2	56.7	15.2	1.5	0.4	38.6		23.9	9.2	12.5	5.0	708.8		11.3	4.4	CI 3.0-5.8	CReSS	Activated carbon in filter - Supervised - Salt Lake City group
		Marlboro UltraSmooth (5 mg tar, 0.4 mg nicotine)	15	♂/♀	27.8	CI 35.5-32.1	15.9	CI 9.5-22.2	54.6	19.4	1.5	0.5	35.9		24.6	12.2	11.7	5.2	638.8		10.2	4.4	CI 3.0-5.8	CReSS	Activated carbon in filter - Unsupervised - Salt Lake City group
Shahab <i>et al</i> [28]	2008	own brand	131	♂/♀	31.4	10.4	13.4	5.7	54.2	14.0	1.5	0.5	37.7	7.8	25.8	10.3	13.6	4.5	712.0	232.0	9.5	2.3	1.4	CReSS	
Blank <i>et al</i> [29]	2009	own brand (mean 14.9 mg tar, 1.1 mg nicotine)	30	♂/♀	32.3	11.0	19.6	4.7	44.4	13.6	1.7	0.6	26.1		18.2	7.6	9.4	3.0	411.4	170.7	8.1	6.0	2.0	Portable CReSS	
		own brand (mean 14.9 mg tar, 1.1 mg nicotine)	30	♂/♀	32.3	11.0	19.6	4.7	57.0	20.1	1.7	0.7	33.5		18.1	8.8	9.7	3.3	578.7	327.2	8.1	6.0	2.0	Desktop CReSS	
		Merit ultra-light (5 mg tar, 0.5 mg nicotine)	30	♂/♀	32.3	11.0	19.6	4.7	52.8	12.6	1.9	0.6	27.8		16.7	7.7	10.1	3.4	528.5	207.2	10.4	6.0	2.0	Portable CReSS	
		Merit ultra-light (5 mg tar, 0.5 mg nicotine)	30	♂/♀	32.3	11.0	19.6	4.7	60.3	20.0	2.0	0.8	30.2		15.2	7.2	10.2	3.1	614.2	301.1	8.1	6.0	2.0	Desktop CReSS	
Dickens <i>et al</i> [30]	2009	Research cigarette (Virginia tobacco, 8.8 mg nicotine)	1	♂/♀					95.0	2.0	3.3	0.2	29.5	2.4					572.0					Smoker Analyser (SA7)	

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			1	♂/♀					72.0	1.0	1.7	0.3	40.7	1.7					573.0					Smoker Analyser (SA7)	
			1	♂/♀					63.0	13.0	1.9	0.3	35.0	2.9					376.0					Smoker Analyser (SA7)	
			1	♂/♀					57.0	1.0	1.7	0.1	34.5	1.1					400.0					Smoker Analyser (SA7)	
			1	♂/♀					119.0	7.0	2.6	0.5	27.5	3.0					717.0					Smoker Analyser (SA7)	
			1	♂/♀					73.0	4.0	1.5	0.2	35.0	0.9					440.0					Smoker Analyser (SA7)	
			1	♂/♀					55.0	5.0	3.3	0.2	29.5	2.4					441.0					Smoker Analyser (SA7)	
Grainge <i>et al</i> [28]	2009	regular	130	♂/♀	31.4	10.5	13.6	6.1	56.2	13.8	1.6	0.5	35.6		26.6	10.5	13.2	4.1	711.7	208.3	9.7			Portable CReSS	
Moolchan <i>et al</i> [31]	2009	own brand	85	♂/♀	15.3	1.2	18.6	8.5	38.5	15.6							5		599.5	201.6	11.1	7.0	1.2	CReSS	Fixed puff count
Collins <i>et al</i> [32]	2010	own brand	89	♂/♀	15.3	1.3	18.6	9.2	41.5	1.2	1.3	0.0	53.9	2.0	14.5	0.7	15.2		630.8		11.7	7.3	1.3	CReSS	
O'Connor <i>et al</i> [33]	2010	own brand (Newport, Marlboro, Camel)	83	♂/♀	39.6	9.9	17.0	8.8	57.7	CI 51.8-63.2	1.8	CI 1.57-1.97	36.5	CI 33.4-39.7	17.6	CI 14.8-20.5	14.4	CI 13.1-15.7	828.0	CI 750-905	14.1			Portable CReSS	Same data as June <i>et al</i> [34]
		own brand (Newport, Marlboro, Camel)	77	♂/♀	49.0	11.9	17.9	9.3	56.7	CI 51.2-62.1	1.9	CI 1.70-2.08	31.5	CI 28.5-34.6	21.3	CI 18.6-24.0	13.7	CI 12.5-15.0	611.0	CI 539-682	10.9			Portable CReSS	Same data as June <i>et al</i> [34], Reduced Ignition Propensity type
June <i>et al</i> [35]	2011	Own brand (Number 7, Peter Jackson, Players, DuMaurier)	42	♂/♀	32.6	12.3	18.0	7.1	59.6	CI 54.2-64.9	1.7	CI 1.6-1.9	36.8	CI 33.8-39.8	19.2	CI 17.0-21.4	14.1	CI 12.7-15.5	834.9	CI 733.1-936.7	15.0			Portable CReSS	
		Own brand (Number 7, Peter Jackson, Players, DuMaurier)	42	♂/♀	32.6	12.3	18.0	7.1	60.3	CI 54.9-65.8	1.7	CI 1.6-1.9	37.2	CI 34.9-39.6	17.9	CI 15.1-20.6	14.2	CI 12.6-15.9	831.7	CI 745.8-917.6	15.0			Portable CReSS	Reduced Ignition Propensity type
McKee <i>et al</i> [36]	2011	own brand	37	♂/♀	37.7	10.6	18.4	7.96							32.9		9.7					6.1	2.3	Portable CReSS	
Strasser <i>et al</i> [37]	2011	own brand	109	♂/♀	45.5	10.8	20.5	8.4											785.1	284.9	16.1	4.9	2.1	Portable CReSS	
Veilleux <i>et al</i> [38]	2011	own brand	78	♂/♀	15.7	0.6	3.29		35.2	16.2	1.1	0.4	43.6	15.6	19.2	8.9	16.5	6.1	582.7		1.9	2.7	1.4	Portable CReSS	23.06 cig/week

Table S1: Literature reporting puffing parameters in chronological order since 2000

Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
Williams <i>et al</i> [39]	2011	own brand	86	♂/♀	38.0	12.0	20.0	7.7	46.2	SE 0.15	1.3	SE 0.01	37.1	SE 0.1	21.0	SE 0.14	12.3	SE 0.15	540.5	SE 7.01	10.8	5.5	1.9	Portable CReSS	control group, same data as Williams <i>et al</i> [40]
Brinkman <i>et al</i> [41]	2012	Kent 100 (non-menthol)	9	♂/♀	23.0	3.5	16.9	SEM 0.7	53.9	SEM 1.0	2.2	SEM 0.1	28.1	SEM 0.6	30.6	SEM 0.6	10.8	SEM 0.5	563.0	SEM 20	9.5			Sodim SPA-D Smoking Puff Analyzer	
Faulkner <i>et al</i> [42]	2012	own brand	18	♂/♀	24.6	5.9	15.2	4.6	54.7	16.7	1.8	0.6	30.8		11.9	5.1	16.5	6.3	903.2		13.7	4.5	2.3	Portable CReSS	
		Benson & Hedges Light 100 (menthol)	9	♂/♀	23.0	3.5	15.2	SEM 0.8	54.7	SEM 0.8	2.4	SEM 0.1	25.6	SEM 0.5	25.6	SEM 0.5	11.6	SEM 0.5	636.0	SEM 27	9.7			Sodim SPA-D Smoking Puff Analyzer	
Perkins <i>et al</i> [43]	2012	own brand	94	♂/♀	26.8	SE 1	19.5	SE 0.6									12.6		568.7		11.1	4.7	SE 0.2	Portable CReSS	
Matsumoto <i>et al</i> [44]	2013	Top 10 brands Japan	101	♂/♀	40.0	11.0	18.4	7.5	54.3	14.1							14.5	3.6	767.2	259.5	14.5			Portable CReSS	
		Pianissimo, Mild Seven One (1 mg tar, 0.1 mg nicotine)	14	♂/♀	39.2	10.2	18.7	8.3	64.6	12.3							17.9	3.2	1160.1	302.7	22.6			Portable CReSS	
		Mild Seven One Extra Lights, Caster Mild, Mild Seven Super Lights (3-6 mg tar, 0.3-0.5 mg nicotine)	38	♂/♀	40.1	12.6	17.8	7.2	56.0	12.2							15.0	3.1	810.0	179.6	14.4			Portable CReSS	
		Cabin Mild, Mild Seven Lights, Mild Seven Original (8-10 mg tar, 0.6-0.8 mg nicotine)	27	♂/♀	41.9	11.2	18.2	6.6	46.9	12.3							13.4	3.4	609.4	158.7	11.4			Portable CReSS	
		Hope, Seven Stars (14 mg tar, 1.1-1.2 mg nicotine)	22	♂/♀	38.0	8.4	19.3	8.8	53.9	15.8							12.6	3.1	638.7	136.9	13.0			Portable CReSS	
McClure <i>et al</i> [45]	2013	own brand	135	♀	31.9	7.6	16.2	7	49.9	15.8	1.6	0.5	32.7	9.1			11.7	3.9	583.8		9.5	4.9	2.2	Portable CReSS	
Strasser <i>et al</i> [46]	2013	own brand	78	♂/♀	38.4	11.7	18.0	8	54.7		1.7	0.1	32.2		30.1	2.1	11.2	0.6	612.6	74.6	11.0	5.8	1.8	Portable CReSS	Day 1 - cigarette 1
		own brand	78	♂/♀	38.4	11.7	18.0	8	46.7		1.7	0.1	27.4		33.7	3.2	11.1	0.8	517.9	36.8	9.3	5.8	1.8	Portable CReSS	Day 1 - cigarette 2
		own brand	78	♂/♀	38.4	11.7	18.0	8	44.5		1.6	0.1	27.8		31.4	3.0	12.6	0.7	560.7	42.7	10.1	5.8	1.8	Portable CReSS	Day 5
Tidey <i>et al</i> [47]	2013	own brand	26	♂/♀	44.5	10.9	23.5	6.5											1451.0	835.0	34.1	6.7	1.8	Desktop CReSS	

Table S1: Literature reporting puffing parameters in chronological order since 2000

Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
Hammond <i>et al</i> [48]	2014	own brand	72	♂/♀	37.2	11.9	16.1	6.3	63.5	22.4							16.1	6.3	977.9	420.8	15.7	4.9	2.3	Portable CReSS	
		Quest 1 (0.6 mg nicotine)	71	♂/♀	37.2	11.9	14.5	4.6	64.3	22.3							14.5	4.6	910.1	520.3	13.2	4.8	2.2	Portable CReSS	
		Quest 2 (0.3 mg nicotine)	71	♂/♀	37.2	11.9	13.8	4.3	64.2	17.2							13.8	4.3	834.2	190.4	11.5	4.8	2.1	Portable CReSS	
		Quest 3 (0.05 mg nicotine)	72	♂/♀	37.2	11.9	13.2	4.5	69.3	18.8							13.2	4.5	890.7	353.6	11.8	4.4	2.3	Portable CReSS	
Norton <i>et al</i> [49]	2014	own brand	16	♂/♀	45.5	SE 3.5	16.1	SE 1.4	67.5	SE 6.3	3.0	SE 1	36.1	SE 1.8	21.3	SE 6.2	13.2	SE 1.1	829.0	SE 51.4	13.3			Portable CReSS	
Schneider <i>et al</i> [50]	2014	own brand	25	♂/♀	45.9	12.4	16.7	4.6	62.2	18.5	1.7	0.5	36.8		18.7	7.7	10.2	2.7	635.5		10.6	5.6	2.0	Portable CReSS	
		own brand	25	♂/♀	45.9	12.4	16.7	4.6	58.8	18.3	1.6	0.4	36.3		19.2	7.6	11.4	2.7	667.5		11.2	5.6	2.0	Portable CReSS	
		own brand	23	♂/♀	39.1	13.8	15.6	4.22	55.3	18.5	1.7	0.4	31.8		14.3	5.0	14.2	4.7	783.6		12.2	4.2	1.9	Portable CReSS	
		own brand	23	♂/♀	39.1	13.8	15.6	4.22	54.8	16.9	1.7	0.5	32.2		15.0	5.5	13.9	5.6	763.9		11.9	4.2	1.9	Portable CReSS	after 10 minutes exercise
Appleton <i>et al</i> [51]	2015	own brand (>13 mg tar)	20	♂	35.3	6.1	10-30		69.7	18.6	2.3	0.6	30.3		38.6	10.8	9.8	2.3	683.1		6.8			Portable CReSS	Total volume if 10 cig/day
		Test cigarette High Tar (~15 mg tar)	20	♂	35.4	6.4	22.4-24.0		59.4	18.3	2.0	0.6	29.4		37.2	10.2	8.9	2.2	528.4		11.8			Portable CReSS	Total volume if 22.4 cig/day
		Test Cigarette Low tar (~7 mg tar)	19	♂	35.1	6.2	20.5-22.6		69.3	19.2	2.4	0.7	29.5		33.3	9.0	9.5	2.5	658.4		13.5			Portable CReSS	Total volume if 20.5 cig/day
Brinkman <i>et al</i> [52]	2015	GPC Full flavor and GPC Ultra Light	24	♂/♀	18-30		>20		55.6	53.71-57.49	2.1	2.042-2.198	27.2	26.22-28.21	19.3	18.48-20.14	11.6		643.8	627.2-660.9	12.9			Sodim SPA-D Smoking Puff Analyzer	Based on puff profiles of Brinkman <i>et al</i> [41]
		GPC Full flavor (15.2 mg tar, 0.97 mg nicotine)	24	♂/♀	18-30		>20		51.9	49.42-54.45	2.0	CI 1.9-2.13	26.7	25.40-28.04	21.0	19.87-22.20	11.5		598.5	579.84-617.77	12.0			Sodim SPA-D Smoking Puff Analyzer	Based on puff profiles of Brinkman <i>et al</i> [41]
		GPC Ultra Light (5.8 mg tar, 0.51 mg nicotine)	24	♂/♀	18-30		>20		59.6	56.94-62.37	2.2	CI 2.14-2.34	27.7	26.27-29.27	17.7	16.59-18.86	11.6		693.4	666.79-721.06	13.9			Sodim SPA-D Smoking Puff Analyzer	Based on puff profiles of Brinkman <i>et al</i> [41]
Chung <i>et al</i> [53]	2015	own brand - white	26	♂	39.2	10.1	>12		57.2	SE 2.69	1.6	SE 0.06	37.1	SE 1.70	25.0	SE 1.52	12.3	SE 0.61	700.8		8.4	5.8	2.1	Portable CReSS	
		own brand- korean	27	♂	37.3	9.7	12.0	1.82	59.6	SE 3	1.5	SE 0.07	42.1	SE 1.94	13.5	SE 1.7	13.8	SE 0.69	820.6		9.8	4.6	2.1	Portable CReSS	
Gass <i>et al</i> [54]	2016	own brand	107	♂/♀	25.0	5.9	2.7	2.2	31.4	13.0	1.2	0.5	26.8	7.9	28.8	45.4	13.5	4.5	413.6	182.2	1.1	1.1	1.5	Portable CReSS	
Krebs <i>et al</i> [55]	2016	own brand	332	♂/♀	37.6	11.6	16.5	6.2	48.2	14.9	1.6	0.4	34.0	1.3	26.6	23.8	12.2	4.8	588.0		5526.6	4.4	2.3	SPA-M	Pennsylvania Adult Smoking Study, same

Table S1: Literature reporting puffing parameters in chronological order since 2000

Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
																									study as Chen <i>et al</i> [56]
Mercincagave <i>et al</i> [57]	2016	Own brand	63	♂/♀	40.7	12.7	19.3	17.68-20.98	56.5	52.45-60.47	1.8	CI 1.63-1.89	32.1		24.4	21.34-27.40	13.8	CI 12.63-14.88	756.0	690.68-821.34	14.6	5.6	1.9	Portable CReSS	same study as Mercincagave <i>et al</i> [58]
		Quest 1 (0.6 mg nicotine)	63	♂/♀	40.7	12.7	22.6	20.93-24.36	52.2	48.13-56.30	1.7	CI 1.53-1.79	31.5		20.9	18.36-23.46	10.8	CI 9.87-11.81	541.0	489.42-592.51	12.2	5.6	1.9	Portable CReSS	same study as Mercincagave <i>et al</i> [58]
		Quest 2 (0.3 mg nicotine)	63	♂/♀	40.7	12.7	24.2	22.35-26.01	52.7	48.91-56.37	1.8	CI 1.61-1.88	30.1		19.1	16.51-21.58	10.9	CI 9.92-11.91	545.1	499.34-590.86	13.2	5.6	1.9	Portable CReSS	same study as Mercincagave <i>et al</i> [58]
		Quest 3 (0.05 mg nicotine)	63	♂/♀	40.7	12.7	20.6	18.53-22.58	61.1	57.18-65.08	1.9	CI 1.79-2.05	31.8		17.5	15.04-19.91	11.8	CI 10.63-12.88	691.1	632.34-749.91	14.2	5.6	1.9	Portable CReSS	same study as Mercincagave <i>et al</i> [58]
Pulcu <i>et al</i> [59]	2016	own brand	110	♂/♀	28.2	9.4	15.8	6.2							26.6	11.4	14.4	4.0						Portable CReSS	
Ross <i>et al</i> [60]	2016	own brand	59	♂/♀	34.9	10.1	14.0	6.4	45.9	16.6	1.5	0.1	31.3	8.4	21.4	9.4	12.4	3.9	536.4	117.0	7.5	5.1	2.0	Portable CReSS	first cigarette of the day
			59	♂/♀	34.9	10.1	14.0	6.4	46.6	16.0	1.5	0.5	32.1	8.8	19.4	8.4	12.9	4.0	554.5	164.7	7.8	5.1	2.0	Portable CReSS	after 4 hours ad libitum smoking
			30	♂	35.5	11.1	14.6	6.9	50.9	17.7	1.7	0.5	31.4	10.5	21.2	7.3	11.4	2.8	559.5	200.9	8.2	4.5	2.0	Portable CReSS	first cigarette of the day
			30	♂	35.5	11.1	14.6	6.9	52.2	17.6	1.7	0.5	31.9	11.0	18.7	8.4	12.2	3.2	582.2	171.8	8.5	4.5	2.0	Portable CReSS	after 4 hours ad libitum smoking
			29	♀	34.4	9.2	13.4	5.9	40.7	13.7	1.4	0.4	31.1	5.8	21.6	11.3	13.4	4.6	512.5	148.1	6.9	5.7	1.8	Portable CReSS	first cigarette of the day
			29	♀	34.4	9.2	13.4	5.9	40.9	12.0	1.3	0.4	32.2	5.9	20.0	8.4	13.7	4.7	526.7	155.3	7.1	5.7	1.8	Portable CReSS	after 4 hours ad libitum smoking
Ross <i>et al</i> [61]	2016	own brand (non-menthol)	58	♂/♀	40.0	13.2	11.8	5.62	82.9		2.1	0.5	39.9	8.3			14.6	4.6	1213.3		14.4	4.0	2.3	Portable CReSS	
Tidey <i>et al</i> [62]	2016	own brand	23	♂/♀	45.0	11.1	23.3	6.2	44.0		1.4		31.4		35.0		11.0		500.0		11.7			Portable CReSS	Graph data, originates from Tidey <i>et al</i> [47]
Farris <i>et al</i> [63]	2017	own brand	64	♂/♀	44.3	9.5	14.8	5.47	63.2	24.4	1.8	0.6	35.9		14.3	5.4	20.4	7.4	1290.1		19.1	4.6	1.5	Portable CReSS	
Higgins <i>et al</i> [64]	2017	SPECTRUM 15.8 mg nicotine/g tobacco	26	♂/♀	36.7	10.8	17.5	10.15	38.9	15.1	1.4	0.4	28.8		19.9	9.3	15.0	8.3	463.8	211.9	8.1	5.2	2.7	Desktop CReSS	
		SPECTRUM 5.2 mg nicotine/g tobacco	26	♂/♀	36.7	10.8	17.5	10.16	35.6	16.1	1.2	0.5	28.9		27.8	24.2	12.0	5.0	370.7	212.2	6.5	5.2	2.7	Desktop CReSS	
		SPECTRUM 2.4 mg nicotine/g tobacco	26	♂/♀	36.7	10.8	17.5	10.17	41.5	12.6	1.4	0.4	29.9		21.0	8.2	11.3	3.2	444.4	200.1	7.8	5.2	2.7	Desktop CReSS	
		SPECTRUM 0.4 mg nicotine/g tobacco	26	♂/♀	36.7	10.8	17.5	10.18	38.6	12.5	1.4	0.4	28.0		21.3	6.1	11.7	3.1	411.9	184.2	7.2	5.2	2.7	Desktop CReSS	
Hsu <i>et al</i> [65]	2017	own brand (non-menthol)	34	♂/♀	41.4	10.9	>10		52.7	18.0	1.6	0.8	32.9		21.0	14.7	12.3	6.6	690.3	547.8	6.9	5.4	2.7	CReSS	
		own brand (menthol)	71	♂/♀	43.8	9.3	>10		55.7	18.5	1.8	0.6	30.9		20.0	12.7	12.6	7.5	691.7	455.9	6.9	4.8	2.1	CReSS	

Table S1: Literature reporting puffing parameters in chronological order since 2000

Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
Watson <i>et al</i> [66]	2017	Kent 100 (non-menthol)	42	♂/♀	35.0		23.0		47.7	SEM 1.5	1.2	SEM 0.03	40.8				14.4	SEM 0.5	686.9		15.8			Portable CReSS	
		Benson & Hedges Light 100 (menthol)	42	♂/♀	35.0		22.0		52.2	SEM 2.7	1.2	SEM 0.03	42.4				15.1	SEM 0.45	788.2		17.3			Portable CReSS	
Bergeria <i>et al</i> [67]	2018	own brand	89	♀	29.7	6.4	15.3	6.1	48.3	2.9	1.3	0.1	36.5	1.4	20.5	1.0	14.8	0.6	716.4		11.0	4.6	2.2	Desktop CReSS	
		own brand	20	♀	30.3	4.9	12.6	5.4	48.2	5.0	1.3	0.1	35.1	2.4	23.7	2.6	14.0	1.4	674.9		8.5	4.4	2.2	Desktop CReSS	pregnant
Chen <i>et al</i> [56]	2018	own brand	326	♂/♀	37.6	11.6	16.5	8.1	48.3	14.9	1.6	0.4	30.2				7.6	4.6	360.0	222.0	5.5	4.4	2.3	SPA-M	Pennsylvania Adult Smoking Study, same data as Krebs <i>et al</i> [55]
Kim <i>et al</i> [68]	2018	own brand	300	♂/♀	~30		0->20		median 60.6	IQR 49.9-73.9	median 1.5528	IQR 1.243-1.923	median 40.4	IQR 32.1-51.1	median 8.8289	IQR 6.5286-1.11961	median 15.5	IQR 13.5-19.0	969.6					Portable CReSS	IQR interquartile range
			250	♂	~30		0->20		median 32.7	IQR 52.7-75.5	median 1.6	IQR 1.2-1.9	median 41.2	IQR 33.1-52.2	median 8.9	IQR 6.5-11.2	median 15.5	IQR 13-19	971.9					Portable CReSS	
			50	♀	~30		0->20		median 53.5	IQR 42-64.2	median 1.4	IQR 1.2-1.8	median 36.4	IQR 30-43.7	median 8.3	IQR 6.2-11	median 17.5	IQR 15-21	936.3					Portable CReSS	
Mercincagave <i>et al</i> [58]	2018	own brand (non menthol)	84	♂/♀	43.0	12.1	13.9	CI 12.5-15.2	52.7	CI 48.1-57.4	1.7	CI 1.6-1.8	31.0		26.1	CI 23.2-28.9	14.7	CI 13.6-15.9	744.0	CI 681-806	10.3	5.5	1.8	CReSS	
		SPECTRUM 400 (9 mg tar, 0.26 mg nicotine)	84	♂/♀	43.0	12.1	16.5	CI 14.9-18.1	49.4	CI 44.4-54.3	1.7	CI 1.5-1.8	29.1		22.3	CI 19.7-24.8	11.2	CI 10.4-11.9	537.0	CI 479-595	8.9	5.5	1.8	CReSS	Research cigarette with reduced nicotine content (5.2mg nicotine/g tobacco)
		SPECTRUM 200 (9 mg tar, 0.07 mg nicotine)	84	♂/♀	43.0	12.1	14.8	CI 13.2-16.5	50.1	CI 45.5-54.6	1.8	CI 1.7-2.0	27.8		20.7	CI 18.2-23.2	12.3	CI 11.5-13.1	598.0	CI 547-649	8.9	5.5	1.8	CReSS	Research cigarette with reduced nicotine content (1mg nicotine/g tobacco)
Shiffman <i>et al</i> [69]	2018	own brand	190	♂/♀	38.0	13.8	2.0		39.6		1.5		25.7				15.8	6.0	625.6	209.8	1.2			Portable CReSS	bought, total puff time known
		own brand	190	♂/♀	38.0	13.8	3.3		38.4		1.5		25.7				15.1	6.1	581.2	227.6	1.9			Portable CReSS	provided for free, total puff time known
Vansickel <i>et al</i> [70]	2018	own brand	13	♂/♀	45.0	11.0	15.4	4	44.1	10.5	1.7	0.4	28.6	6.1										Sodim SPA-D Smoking Puff Analyzer	

Table S1: Literature reporting puffing parameters in chronological order since 2000																									
Author	Year	Sort	n	Gender	age	SD	No of cig/day	SD	Puff volume (ml)	SD	Puff duration (sec)	SD	Puff flow	SD	Puff interval (sec)	SD	Puff count	SD	Total volume (ml/cig)	SD	Total volume /day	Fagerström index	SD	Device	Comments
Yuki <i>et al</i> [71]	2018	own brand (~6.5 mg tar)	20	♂/♀	30.9	12.5	17.3	6.6	58.5	20.2	1.6	0.4	36.1				14.6	4.2	858.0	369.0	14.8	4.3	1.7	Portable CReSS	Baseline
		own brand (~6.5 mg tar)	20	♂/♀	30.9	12.5	17.3	6.6	58.8	19.0	1.8	0.7	32.3				14.6	3.8	857.0	296.0	14.8	4.3	1.7	Portable CReSS	day 1
		own brand (~6.5 mg tar)	20	♂/♀	30.9	12.5	17.3	6.6	62.8	19.2	1.8	0.5	35.3				15.2	3.4	989.0	425.0	17.1	4.3	1.7	Portable CReSS	day 3
		own brand (~6.5 mg tar)	20	♂/♀	30.9	12.5	17.3	6.6	56.0	14.4	1.6	0.4	34.6				14.2	3.4	847.0	292.0	14.7	4.3	1.7	Portable CReSS	day 5
Watson <i>et al</i> [72]	2019	own brand	163	♂/♀	42.4	18-66	16.1	6-40	54.1	CI 51.5-56.7	1.5	CI 1.48-1.59	35.4		16.8	CI 15.2-18.5	11.0	CI 9.8-12.1	595.1		9.6			CReSS	day 1
		own brand	163	♂/♀	42.4	18-66	16.1	6-40	53.6	CI 51.1-56.1	1.5	CI 1.47-1.58	35.3		16.3	CI 14.7-17.9	14.9	CI 13.4-16.5	798.6		12.9			CReSS	day 2

Calculated values in *italic*. SD = standard deviation, CI = 95% Confidence interval, SEM = Standard error of the mean, SE = Standard error, ♀ female, ♂ male, CRSSPT = Clinical Research Support System, Plowshare Technologies, CReSS = CReSSmicro™ (Clinical Research Support System), Plowshare Technologies. Blue: highest value. Yellow: lowest value. § Data originates from ISO/TR 17219:2013 (stated as personal communication) [73]

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