Tobacco returns for the 2015 calendar year

Analysis of Manufacturers' Returns on Tobacco.

Report to the Ministry of Health for 2015

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Executive Summary

Aim Tobacco product manufacturers and importers' returns are required annually by the Smoke-free Environments Act 1990, and this report analyses those returns for calendar year 2015.

Method The returns to the New Zealand Ministry of Health provide data on tobacco used in manufacture and firms' sales dating back to 1990. Unless stated otherwise, the traditional method of counting one cigarette to equal one gram of cigarette tobacco was used. The data are analysed on Excel spreadsheets (Tables A to I, attached). Manufacturers' returns and machine smoke tests on their own products were reported as received and not independently audited. The prices used in estimations were the firms' reported recommended retail prices, and retail price discounting is not reported.

Setting Manufacturers and importers supplied data to the Ministry of Health for calendar year 2015 and their data were downloaded from the Ministry website.

Results This report highlights the continued rate of cigarettes sales reduction from 2010 to 2015.

Representative counting by weight (Roll-your-own (RY0) cigarette =1g). During 2014-15 cigarettes and tobacco sales overall decreased from 2428 tonnes to 2358 tonnes, a decrease of 2.9%. Per adult, sales decreased 5.0%. Manufactured cigarette consumption, in tonnage, decreased 2.6% and roll-your-own cigarettes tonnage increased 4% (Table A2).

Counting standard (1RYO cigarette = 0.7g,) sales in tonnes decreased 3.0%. and per adult decreased 5.0% (Table A1). RYOs reached 30% of all tobacco sold for smoking.

For the years 2010 to 2015, standard cigarette and tobacco consumption per adult decreased on average by 5% annually.

Overall, in the 2010-2015 period, cigarette and tobacco consumption per adult declined by 25% in 5 years (a 5.0% decrease between 2014 and 2015) to an all time low of 712 standard cigarettes per

adult in 2015. This is equal to a 65% decrease in cigarettes per adult from 1990 to 2015. (2.6% average annual decrease over this time.)

Philip Morris increased its manufactured cigarette sales by 36.5%, otherwise companies produced less volume sales change.

In the preceding 10 years (2000-2010) the rate per adult decreased 2.4 percent annually on average. The greater increase in decline in 2010 to 2014 is due to the annual 10 percent real excise increases from 2010 onwards - which is legislated through to 2016. These increases coincide with the calendar year returns of tobacco manufacturers to the Ministry of Health.

As in past years, 99 percent of tobacco consumption was due to cigarettes, with 30% of all tobacco smoked as RYOs. Twelve firms supplied returns. The results are analysed in seven tables and three figures in the body of this report, and in 28 additional tables (listed in Table 2 below), attached. Trends for a given year varied slightly between tobacco weight used, tax-paid tobacco releases, and tobacco product sales for a given year.
In 2000-2010 cigarette price increased 0.31% on average annually in real terms (Table 9) and standard cigarettes smoked per adult also decreased 0.24% annually on average (Table E6).

Manufactured versus RYO. From 2014 to 2015 manufactured cigarettes sales volumes per adult decreased 4.6% per adult, and decreased for roll-your-owns by 5.9% per adult (Tables B2, C, and E6).

Brand sales. The most popular brand is now Pall Mall which increased its sales 2.4 times in the past 10 years. West also increased sales. Imperial's low priced John Player brand, now the third most popular, held most of its sales but all other brands lost sales greatly.

Recent trend, 2010-5 Number of cigarettes released for sale per adult

RYOs reached 30% of all cigarettes smoked.

Table 1. Cigarettes released per adult 2010 to 2015 compared, assuming RYO cigarettes contained 0.7 g tobacco.

	Manufactured cigarettes per adult (Table C, col. i or Table E6)	Roll-your own cigarettes, per adult 1 RYO=0.7 g (Table D2)	Total cigarettes smoked, including standard 0.7 g sticks per adult Table E6	RYO as % of total sticks sold
	A	B	C	D
2010	639 sticks	317	956	33
2011	593 sticks	257	849	30
2012	569 sticks	239	808	30
2013	529 sticks	234	762	31
2014	521 sticks	228	749	30
2015	497 sticks	215	712	30

Source: Table E6.

Pack size sales The smallest permitted pack size is 20 cigarettes. Packs of 20s increased their share of sales from 49% in 2010, to 53% in 2011, to 52% in 2013, and to 64% in 2014 and then 47% in 2015.

Roll-your-own cigarette tobacco sales decreased from 570 tonnes in 2014 to 548 tonnes in 2015 Standard cigarettes from RYOs per adult increased from 228 to 215 standard cigarettes from 2014 to 2015 (Table E6).

All cigarettes in standard terms (1 RYO=0.7 g): The 749 standard cigarettes per adult (Table E6) equated to 2673 billion standard cigarettes of 0.7 g tobacco smoked in 2014. (Table A1), and the 712 standard cigarettes smoked in 2015 equated to 2593 million in that year. The total number of standard cigarettes smoked per adult reduced 65% in 25 years since the Smoke-free Environments Act 1990 (Table E6).

Trend in revenue in calendar years 2009-15: Tobacco excise revenue increased from $1096 million in 2009, to $1149 million in 2010, to $1269 million in 2011, to $1251 in 2012 and to $1325 million in 2013. (Table H4, taken from www.treasury.govt.nz (tax outturn data). For 2014 the total revenue from tobacco excise was estimated at $1422 million dollars in 2014 dollars (excise x volumes sold, and discounting customs duty contribution) and becoming $1566 million in 2015.

Tobacco used in the manufacture of smoking (combustible) tobacco products

Manufactured cigarettes, tobacco content Dry weight of tobacco used in manufacture for sale of cigarettes in New Zealand declined 71% per adult age 15 years and over between 1990 and 2015, an average annual decline of 3% (Table B2, col. c).
Cigarette hand-rolling tobacco. For 2015, tobacco used for RYO (roll-your-own) cigarette manufacture totalled 602 tonnes. Use of tobacco in RYO cigarettes reduced markedly due to increased excise on RYO cigarettes from May 2010.
Pipe tobacco. Use and sale of pipe tobacco decreased further to 1.7 tonnes. Pipe tobacco accounted for 0.1% of all tobacco used. (Table D2, E1).
Cigars. Tobacco used in cigars remained at 7.7 tonnes and accounted for 0.5 % of all tobacco used in 2015. (Table B1, E1).

Reported sales of smoking tobacco products (FM, RYO)

Reported volume sales of smoking tobacco products based on Tables G and I, decreased from 2428 tonnes in 2014 to 2358 tonnes in 2015, a decrease of 2.9%, based on traditional counting. (1 FM =1 RYO) Or counting standard cigarettes (1 RYO=0.7 g tobacco), the decrease was -3.0%.

Manufactured cigarettes
From 2014 to 2015, reported manufactured cigarette sales decreased from 1858.5.million to 1810 million, a decrease of 2.6%. (Table A2). Value by RRP was $0.90 per cigarette or $1.623 billion.
Cigarette hand-rolling tobacco
From 2014 to 2015 hand-rolled tobacco sales decreased 3.8% from 570 tonnes to 548 tonnes. (Table A1). Average recommended retail price was $1.47 per gram, a total value at retail of $810 million assuming no discounting. (Table I.1)
Pipe tobacco. Sales were 1.7 tonnes in 2015. (Table D2)
Cigars. Brands and weights varied greatly. Sales were 7.7 tonnes in 2015. (Table A1, I3).

Smoke tests (manufactured cigarettes only) (Table G, final summary totals)
These are smoke machine tests only, not of human smoking.
In 2015, sales weighted yield of tar was 11.62 mg, and for nicotine 1.09 mg. Tar to nicotine ratio was 10.66. Carbon monoxide was not added in total for 2015.

Conclusions

RYO tobacco smoked as 0.5 g per cigarette, costs 40% less in excise tax than a RYO or factory-made cigarette smoked as a 0.7 g cigarette.

Type of tobacco product smoked. The cigarette (whether FM or RYO) is the tobacco product class most popular and dangerous to the user, producing toxic smoke, inhaled some 200 times daily for decades. In New Zealand the cigarette since 1990 has accounted for 99% of tobacco used (Table E1). Cigars and pipes accounted for the remaining 1%. RYOs accounted for 12.5% of tobacco used in 1990, and for 28% in 2014, and in 2015 represented 30% of tobacco smoked.

Measuring the harm caused. In recent years the average hand-rolled cigarette contained close to 0.5 g tobacco, but for tax purposes the average RYO cigarette is now assumed to contain 0.7 g tobacco to approximate the tobacco content of a factory-made cigarette (0.7 g). Table 1 is thus an underestimate of the number of RYO cigarettes smoked, especially when the excise rate is high, as RYO cigarettes can be rolled to contain less tobacco.[1]

Detailed analysis

Introduction
This report should be read in conjunction with the attached Detailed Tables A to I, listed in Table 2, which contains back data from 1990. Analysis was not commissioned by Ministry of Health for 2008.

Background
From 1991 the Smoke-free Environments Act 1990 has required New Zealand tobacco manufacturers and importers to report to the Ministry of Health for the previous calendar year on tobacco and additives used, and on tar and nicotine in cigarette smoke. Price and sales by brand also required by the Act, were reported by manufacturers from 1994 onwards. This report, for calendar year 2015, again reviews the quantities of tobacco products sold, tobacco, additives used, tar and nicotine yields in smoke, and on tobacco product sales, and the tables enable a review of past years.

Method
The returns of the tobacco manufacturers to the Ministry of Health were analysed on Excel spreadsheets, collated with tax-paid releases of cigarettes and loose tobacco from Statistics New Zealand in past years, and presented in Excel-derived tables. Since 2010 it became necessary to rely on manufacturers' reports of their sales without the back-up from Statistics NZ. Since 2014 it has been possible to obtain Treasury data. These changes were adopted to protect the data of the remaining tobacco products producer in New Zealand.

Recommended retail price (RRP). For all firms we used the most relevant RRPs. To calculate total tobacco products sold, a million manufactured cigarettes were equated with one metric tonne of manufactured loose tobacco or cigars, as traditionally estimated in previous reports.
For calculations of number of the new standard 0.7 g RYO tobacco cigarettes, one tonne of RYO cigarette tobacco = 1.4286 million RYO cigarettes, and one million factory made cigarettes contained 667 kg of tobacco in 2009, and the tax on either type was equalised from May 2010 as shown in Table H5.

Dry tobacco used was estimated (assuming zero moisture), after 13.5 percent moisture was subtracted for manufactured cigarettes, 20 percent for cigarette tobacco, 19 percent for pipe tobacco, and 12 percent for cigars from moist weights.
Additives are presented as comprising part of the weight of tobacco used in manufacture. Manufacturers are not required to report moisture. The moisture percentages were those supplied by BAT.

Smoke tests. Manufacturers and importers reported smoke machine yields of tar and nicotine from their own laboratories as mg per manufactured cigarette, as required by regulations and schedules of the Act, based on the ISO machine test method. The test results were not audited independently of firms reporting. These machine methods report yield, but humans extract about twice as much smoke as does the machine, as BAT scientists have shown (Mariner 2010). Indeed from 2007, these data were removed from the packets, to avoid misleading consumers.

Tobacco and additives use. Major manufacturers and importers reported moist tonnage of tobacco and additives used by product category. (Tables F)

Number of brands sold. The number of manufactured cigarette brand variants on sale, including different pack sizes, was based on reported sales for 2015, excluding duty free brands.
Cigar reporting. Sales and usage reports were entered to estimate usage or sales in Tables A3 and I.3.

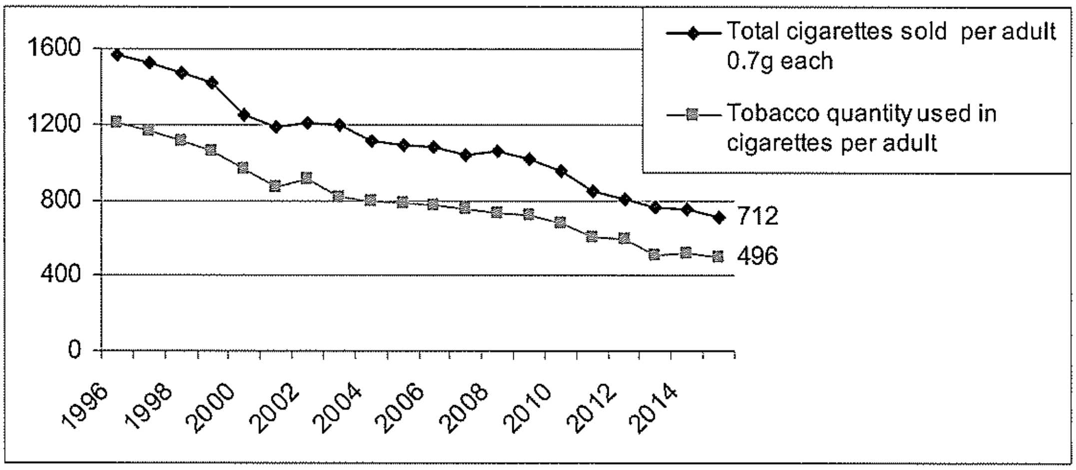
Table 2. Additional tables

Tobacco use tables	
A	**Firms' tobacco use and sales, by tobacco product class, 2015**
A1	Tobacco consumed 2014 to 2015 by main firms reporting
A.2	Tobacco used and cigarette sales, by all firms reporting
A.3	Sales in millions of sticks or tonnes, by firms
A.4	Tobacco used, by firms; tonnes.
B, C, D	**Tobacco used by tobacco product class 1990-2015**
B.1	Tobacco used in cigars, 1990-2015
B.2	Tobacco in all products 1990-2015
C	Tobacco used in manufactured cigarettes 1990-2015
D.1	Cigarette RYO tobacco
D.2	Pipe tobacco and all loose tobacco
E	**Firms market share of tobacco used**
E1	Tobacco product classes by tobacco usage 1990-2015
E2	Tobacco used, by firm; tonnes, 1990-2015
E3	Firms' manufactured cigarette volume sales
E4	Firms' share by volume of manufactured cigarettes sold
E5	Firms' share of weight, of dry tobacco use
E6	Manufacturers' reported sales of standard cigarettes

Results

Manufactured cigarette and hand-rolled tobacco releases, sales, and usage in manufacture within each product class, show similar trends, although measured in different ways. Consumption and usage of tobacco have declined more steeply since 2010 when excise was increased.

Figure 1. Combustible tobacco products: firms' reported sales, and firms' reports of tobacco used, 1990-2015, g per adult.



Data source: Tables B2 and E6
Source: Statistics New Zealand; Manufacturers' returns.
Missing 2008 data (when no survey was ordered)) for the lower plots have been interpolated.

Table 3. Tobacco used in tobacco products sold within New Zealand, 1990-2015

Year	Manufact-ured cigarettes released Millions	Tobacco used in manu-factured. Cigarettes Tonnes	Tobacco used per manu-factured. Cigarette g (moist)	Tobacco used making RYO cigarettes Tonnes	Tobacco used in pipe tobacco Tonnes	Tobacco used in cigars Tonnes	Total tobacco Used (dry weight) Tonnes
Source	Table C	Table C.	Table C.	Table D.1	Table D.2	Table B.1	Table A3.
1990	4489	3770	0.84	591	27	3	3758
2000	3152	2092	0.66	721	9	24	2407
2010	2220	1468	0.66	735	4	15	1978
2011	2083	1464	0.70	641	4	19	1797
2012	2017	1466	0.73	632	2	16	1765
2013	1886	1333	0.71	582	6	14	1524
2014	1859	1300	0.70	553	2	11	1578
2015	1810	1300	0.72	602	1.7	8	1535
1990-15 %	*-60*	*-66*	*-15*	*-17**	*-94*	*-66**	*-59*

*Cigars and RYOs were underreported in 1990 and the % answer for 2015 reflects 2000 as a base. Tobacco is measured by moist weight except for the right-hand column.

As Table 3 shows, tobacco use has reduced for all tobacco products since 2000

Tobacco use: by product class. In 2015, of all tobacco (dry weight) used, 68 percent went into manufactured cigarettes, 31 percent into hand-rolled cigarette tobacco, 0.5 percent into cigars, and 0.1 percent into pipe tobacco. (Tables A3 and E.1)

Tobacco used: trend. The total (dry weight) of tobacco used in tobacco products per adult (Table B2, col. c) decreased 71 percent per adult from 1990 to 2015. Moist tobacco used per adult decreased also by 71% in this period. (Table B2, col. d). Most of the decrease was due to a decrease in the number of manufactured cigarettes sold per adult, (Tables C) aided by less tobacco used per manufactured cigarette.

Imports versus local production. Of the major tobacco companies, only Imperial now has a factory in New Zealand. Thus according to Table A1 24% of raw smoking tobacco products for use in New Zealand is imported by Imperial. BAT moved its manufacturing from Napier to Sydney in 2006, then to Asia, and is now the leading importer, followed by Philip Morris.

Interpretation. Decreases in consumption have been greater than the rate of population increase. However in 2015 all types of tobacco products usage and sales were in decline. in absolute and relative terms.

Additives

Nicotine Additives or ingredients are reported according to industry definitions which generally do not report the content of the most weighty and lethal substance in the cigarette (the tobacco), or the amount of its most addictive ingredient, nicotine.

Nicotine content of cigarettes is not stated by any manufacturer for any brand. The amount of nicotine used indicates the degree of addiction likely to result.

Other additives Manufacturers reported using 79 tonnes of additives in tobacco products sold in 2015 (4.3%), of which 77 tonnes was used in making hand-rolled tobacco (From Table A3). Additives in 2015 constituted 0.77% of the weight of the moist tobacco in manufactured cigarettes, 12% of hand-rolled cigarette tobacco weight, and 8% of pipe tobacco.

In reporting on 1999-2015 sales, most tobacco companies participated in supplying a common list of several hundreds of additives for cigarettes, with a maximum percentage by weight (of unburnt product) supplied for each ingredient or flavour, one maximum for all brands. BAT, Imperial, Japan Tobacco International, and Scandinavian attached combined lists of this type for various product classes. These Quantities Not Exceeded (QNE), or maximum use level for each ingredient and each brand, do not disclose actual amounts used. In particular, menthol is specified as not more than 0.5% of the tobacco weight, but much smaller amounts may be added to non-menthol cigarettes.

The main additives are water and sugars. Only some Chinese brands revealed sugar content – over 20 percent, but how much was natural and how much added was not disclosed.
British American Tobacco (BAT) do not talk about additives so much as ingredients. In a New Zealand RYO Domestic Ingredients Report for June 2010 to May 2011, (www.bat.co.nz) BATNZ reports that cigarette ingredients for Holiday Red in descending order of weight are tobacco (including reconstituted tobacco), water, glycerol, propylene glycol, sugars, cellulose fibre, potassium sorbate, calcium carbonate and lactic acid. In 2013, BAT NZ website for RYOs ranks the QNE in descending order at propylene glycol 5.9%, glycerol 4.4% menthol 0.5%, and invert sugar 1.1%. BATNZ shows no brand specific quantities for manufactured cigarettes, but the listed ingredients are roughly similar to RYO tobacco. For pipe tobacco QNEs for sugars and syrups total 30% of the weight.
Imperial Tobacco lists QNE values at 25% water, 11.9% honey, 5.9% inverted sugar, 5.0% propylene glycol, and 4.4% glycerol. Permission to use these sugars is assumed (no law prevents it) in addition to the natural sugars in tobacco (up to 15%). Menthol is 0.5%.
Philip Morris displays tobacco and other additives by brand. The specific brand information is at www.pmintl-technical-product-information.com in 2015 and for Marlboro Red (accessed May 2012) shows sugar or invert sugar is the main additive (3.2%), other additives are 3.6%.
63.6% of the cigarette weight is tobacco and 9% is water. 4.4% is cigarette paper. the constituents of the cigarette which are destined to be destroyed by combustion to form smoke; 16.5% is allowed for the weight of filter and its wraps, inks and glue which will not be burnt. Considerable effort has gone into specifying very low percentage levels of flavours.

The noxious gas emissions are not reported, nor have they ever been required.

Menthol weight QNE is reported as 1% for the filter, and 0.8% for the cigarette.
Although some brand specific information is recorded, information on nicotine content is strikingly absent in all returns made, even though nicotine is the active ingredient most responsible for

fostering and maintaining addiction to tobacco smoking. Nicotine is no doubt considered by tobacco companies as an inherent part of tobacco rather than an additive.

Nicotine content of cigarettes has not been listed as a statutory requirement for analysis.

Smoke machine tests

Manufacturers or importers, as required by Section 35 of the Smoke-free Environments Act have reported smoke-machine-tested tar, nicotine and carbon monoxide in the smoke of manufactured cigarette brands using the ISO method. Results for the brands tested by the manufacturer are displayed in Table G, but were not verified by any independent laboratory.

Table 4. Average sales-weighted yields of tar, nicotine and carbon monoxide; and tar/nicotine ratios, 2001-2015

Year	2001	2003	2005	2006	2007	2009	2010	2011	2012	2013	2014	2015
Tar mg/cigarette	12.4	11.7	11.0	11.0	10.5	10.0	11.3	11.6	11.3	11.1	10.3	11.62
Nicotine mg/cigarette	1.1	1.05	0.97	1.0	0.94	0.85	1.02	0.97	0.95	1.0	1.07	1.09
CO mg/cigarette	12.1	11.5	11.75	11.3	10.3	10.6	13.4	13.7	13.4	-	11.26	*
Tar /nicotine	11.0	11.1	10.8	11.1	10.9	10.2	11.2	11.9	12.1	11.1	9.64	10.66

*Analysis for CO has been reported separately and not for the whole group.

Cigarette tobacco, pipe tobacco and cigars: No smoke tests were required by the Ministry of Health, and none were reported by the companies. In particular, nicotine content per cigarette or per gram of RYO tobacco was not required or tested.

Manufactured cigarettes

Table 5. Volume sales by brand groups, manufactured cigarettes 2005-2015

Brand sales in millions	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2007**	**2006**	**2005**	**Rank on volume sales 2014**
Pall Mall	419	403	440	468	500	440	341	199	189	175	1
Holiday	213	316	353	411	407	485	578	659	668	681	2
John Player	199	213	186	190	198	132	46	3.5			3
Rothmans	148										4
Benson & Hedges	115	134	137	149	165	212	247	292	317	329	5
Winfield	93	109	112	129	149	175	218	288	289	289	6
West	91	72	9								7
Freedom	87	152	169	136	96	101	51	35	34	22	8
Marlboro	74	74	76	76	86	98	106	106	103	97	9
Horizon	73	84	108	128	139	160	208	269	265	276	10
Total top ten brands	1470	1628	1723	1836	1906	1993	2087	2185	2200	2206	
Total all brands	1810	1858.5	1895	2017	2083	2220	2305	2334	2345	2335	
Top ten as % of total	81	88	91	91	91	90	91	94	94	94	

Source: Table G.

Sales trends by brand groups.
The top ten brand groups accounted for 81% of total sales in 2015. (Table 5).
Manufactured cigarettes declined 3.2% in 2015.

Sales trends by brand variants
The most popular brand is now Pall Mall which has increased its sales by a factor of 2.4 in the 10 years from 2005 to 2015. In 2015 almost all brands showed a decline in sales since 2014. In 2015 of the top ten brands, budget brand West is the only one to increase sales.

Number of manufactured cigarette brands on sale
Method. Separate pack sizes are counted as separate variants, and include a small number of sales packages of 40 to 50 cigarettes. (Table G).

Results. The number of brand variants on sale was 152 in 2002, 149 in 2003, and 182 in 2004, 177 in 2005, 184 in 2006, 190 in 2007, 213 in 2009, 218 in 2010, 213 in 2011 (corrected), 224 in 2012, 195 in 2013, in 2014, 189, and in 2015, 135.
The number of brands sold in 20s was 47%.

Cigarette tobacco

Reported sales of RYO cigarette tobacco
Method. Sales reported by the manufacturers are displayed in Table I.1.
Results. Volume sales decreased 3.9% and per adult decreased 5.9%. (Table E6)
Brand volume changes (Table 6). Port Royal remained the most popular RYO brand, but Riverstone increased its market share.
RRP and dollar sales. In 2015 RRP was $1.47 per gram, a total value at retail of $808 million, (Table I1) assuming no price discounting.
Number of brands. Sales were reported for 74 RYO brand variants in 2015. (See end of table I.1.).

Table 6. Volume sales trends, by brand of hand-rolling tobacco, 2004-2015

Brand group	2015 Sales, Tonnes	2014 Sales, Tonnes	2013 Sales, Tonnes	2012 Sales, Tonnes	2011 Sales, tonnes	2010 Sales, tonnes	2009 Sales, Tonnes	2007 Sales, tonnes	2004 Sales, tonnes	Rank by Sales, 2015
Port Royal	120	144	157	174	176	251	293	305	291	1
Park Drive	98	116	114	139	161	202	228	237	259	2
Riverstone	92	71	63	52	46	34	31	20		3
Winfield	63	65	76	76	86	98	106	106		4
John Player Spec	46	48	43	33	39	33	16			5
Total top 5	419	444	490	515	546	659	740	762	795	
Total all brands	635	570	550	587	631	771	825	813	837	
Top 5 as % of all	*66*	*78*	*89*	*88*	*87*	*85*	*90*	*94*	*95*	

Pipe tobacco: Reported sales
Results Sales (1.7 tonnes) sold at an average estimated retail price of $1.55 per gram, with a total estimated retail value at this price of $2.6 million. 8 brand variants were sold.

Cigars: Reported sales
Results The leading importing companies were Scandinavian Tobacco Group and Philip Morris. Brand variants were multitudinous, and weight per cigar varied from cigarillos of about 0.7 grams

tobacco to the largest cigars sold singly. Cigarillos dominated. Packet sizes varied. Tobacco was estimated at 7.7 tonnes imported as cigars, comprising 0.5% of total moist weight of tobacco used in overall tobacco products for sale. (Table E.1, I.3).

Tobacco trade: gross sales of manufactured cigarettes and cigarette tobacco

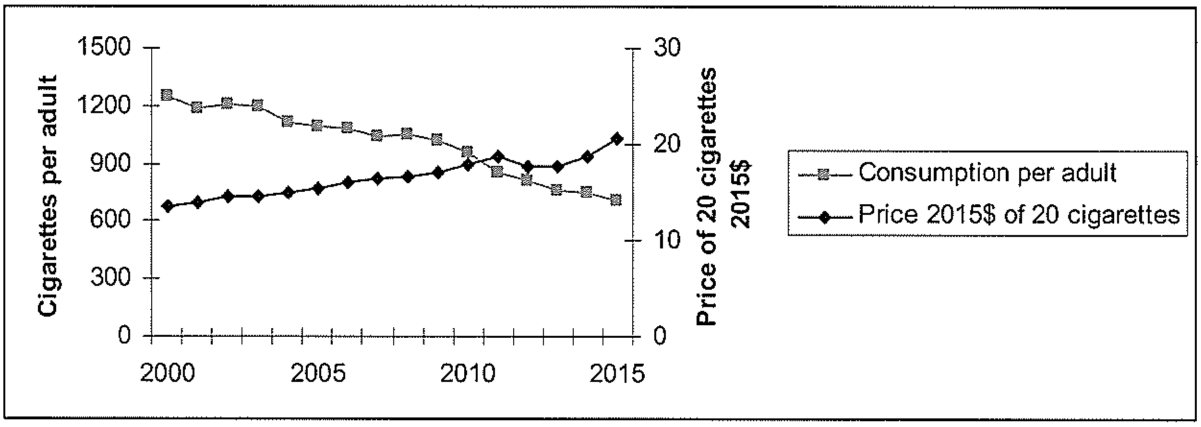
Total consumer expenditure on cigarettes and RYO tobacco.
Method. Manufacturers' reported volume sales and RRP in 2015 (Table H3).
Results Sales for manufactured cigarettes in 2015, based on RRP, were estimated at $1.629 billion (Table G and H1); hand-rolled cigarette tobacco sales made up $805 million dollars (Table I.1), making a total cigarette market of $2.434 billion (Table H.3) in 2015, assuming the recommended retail price was not discounted.

Prices, consumption and revenue from sale of cigarettes and tobacco

Method. In Figure 2, price is derived from Table H4 in constant 2015 dollars. Total cigarettes, manufactured and hand-rolled per adult are from Table E6.
Results. As the real price of cigarettes increased the manufacturers reported fewer cigarettes sold per adult. The real price of cigarettes was maintained by annual inflation adjustments since 1990. (Table H.5) Superimposed on this annual adjustment, in 1990, 1991, 1995, 1998, 2000 and 2010 and 2011-15 cigarette and tobacco prices were increased in real terms by legislative action.

Sensitivity of tobacco products sales to price
Trend in gross sales From 1990 to 2015, standard cigarette sales volumes per adult decreased 65% (Table E6, col. g), the adult population increased 41%, (Table B2, E6) and smoking prevalence was lower.

Fig. 2. Cigarette price and sales reported by manufacturers, 2000-2015



Source Table E6 and H5.

The effect of price in driving down consumption is shown by the divergent plot lines in Fig 2.
In Figure 2, the effect of the decrease in consumption (5%) in 2015 is seen in the lower graph.
The drop in real price in past years in the upper graph is due to the extra rise in the price of RYOs.

Method. The tobacco excise rate (www.customs.govt.nz, and Table H.5) and firms' sales (Tables G and I) were based on recommended retail prices, in constant dollars.

Excise (1) Excise rates were annually adjusted for inflation since 1990, and raised above the level of inflation in 1991, 1995, 1998, 2000, and from 2010 through to 2016.

2) With effect from 28 April 2010 excise on factory-made cigarettes was increased 10% and the RYO excise rate was also increased by this amount plus a further 14% more to increase and equalise the RYO excise rate with that of factory-made cigarettes.

Prices CPI inflation-adjusted consumer prices are given in Table 7.

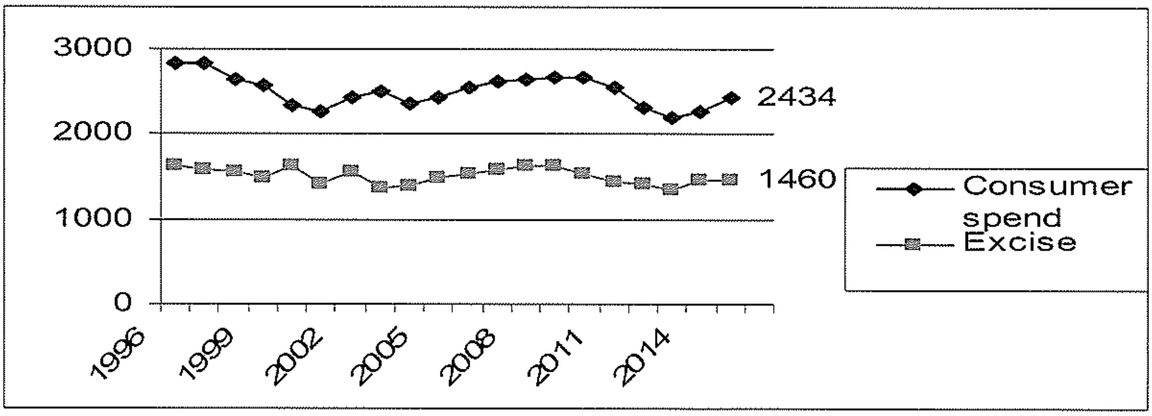
Revenue Due to the gradual decline in smoking prevalence tobacco revenue tends to decrease if excise rates are not increased frequently. Revenue suffers annual fluctuations due to commercial reasons.

In 2000-2010, the real price increased annually by 2.3 percent, reflecting no excise increases above CPI adjustments between these years. In response, standard cigarette consumption decreased only 2.37 percent annually.

With strong excise rate increases in 2010-14, excise revenue increased to 1269 million dollars for 2011 declining slightly to 1251 million dollars in 2012 and increasing to 1325 million dollars in 2013 (from tax outturn data www.treasury.govt.nz) and then to an estimated 1422 million dollars in 2014 and to $1566 in 2015. However, for the second to last column in Table H3, the data given are obtained by multiplying the excise tax levy by the number of cigarettes on which excise was paid, and the data are similar.

Trend in cigarettes smoked per adult, 2000-2010, versus 2010-2015 (Table 7).
Method For top plot in Fig 3, consumer spend is calculated as the product of price and volume.
Results In 2010-15 cigarette consumption decreased at 5.1% per year, greater than in 2000-2010 (3.4%). However in 2013, the excise was being paid by 15.1% of the adult population, according to the Census in that year.

Figure 3. Estimated tobacco excise revenue compared with Recommended retail spend on cigarettes, 1996 to 2015 (constant 2015$)



Method. Consumer spend (RRP price times volume) is deflated by the all items consumer price index to give revenue in 2015 dollars. Excise is derived as fraction of excise tax paid on tobacco deflated by all items consumer price index.
Source: Table H5.

Government share of the price. Government's share of the price from excise and GST decreased from 71 to 69 percent in 2000-2010, then increased to 74 percent in 2012 and 77 percent in 2014 and to 73% in 2015 dollars. GST is levied on most goods and services, and makes up 13 percent of the final price. The fall to 73% is due to an increase in the tobacco industry take from 21.2 cents per cigarette in 2014 to 27.9 cents in 2015, which offsets its drop in profits by $20 million in Table 7 and Table H4.

Table 7. Summary of tobacco trends, 1990-2015.

From H4=2015$ Population given		1990	2000	2010	2013	2014	2015	2014-5 %
0.7 g Standard cigarettes, sales /adult p.a*	E6	2056	1253	956	762	749.3	*711.9*	*-5.0*
Cigarettes (1 RYO = 1 cigarette).	B2	1970	1340	861	692	681	*647*	*-5.0*
Tobacco excise $ per cigarette (2015$)	H5	.219	.197	.276	.187	.212	*.279*	*31.3*
GST $ per cigarette or per g	H5	0.068	.076	.103	.115	.122	*.134*	*10.4*
Excise +GST as % of packet price	H5	64	71	69	75	77	*73*	*-5.2*
Tobacco excise revenue $ millions	H5	583	944	1099	1332	1457	*1460*	*0*
RRP Price $ /cigarette	H5	.591	.681	.893	.888	.936	*1.032*	*10.6*
Consumer real price index, $ /cigarette in 2015$	H5	0.351	0.579	0.72	0.985	.9975	*1000*	*0.25*
Consumer spend in mlns 2015$	H5	3120	2350	2670	2194	2272	*2434*	*7.2*
Industry revenue 2015$ per cigarette or gram of tobacco product	H5	0.22	0.197	0.276	0.187	0.212	*.279*	*31.3*
Industry sales 2015$ millions	H5	1114	786	826	654	581	*562*	*-3.5*
Tobacco sales millions	H5	5091	3451	2991	2469	2428	*2358*	*-2.9*
Population age 15 years plus, millions	B2	2.58	2.98	3.51	3.57	3.57	*3.64*	*2.1*

** Standard cigarettes include RYOs at 0.7 g tobacco only; otherwise, as weighing 1 g tobacco.*

Current excise and GST places New Zealand in the top group of countries in taxing tobacco.

Tobacco trade's receipts and share of the price

As Table 7 shows, in 2015 dollars the trade improved its receipts per cigarette by 31% from the 2014 result, but still lagged in receipts by over $20 million. The tobacco trade (including retailers) share of the final retail price changed (in 2015 dollars) from 19.7 cents a cigarette in 2000, to 28 cents in 2010, to 19 cents in 2013, to 21 cents in 2014 to 28 cents in 2015. (Table H4, adjusted by CPI).

The tobacco trade revenue in 2015$ increased from $786 million in 2000 to $826 million in 2010, then decreased to $581 million in 2014 and further to $562 million in 2015 in 2015$. The tobacco industry and trade from 2010 to 2015 increased its dollar margin in real terms every time government increased the excise per packet, successfully preserving its share of the final price at 20 cents per cigarette or more from 2001 to 2015.

Discussion

Brand variants Brand variants in 2015 made up 156 brand variants of manufactured cigarettes, 75 RYO brands, 8 pipe tobacco brands and innumerable cigar brands.

Additives Lists supplied as part of the Returns show once again that sugars and fruit flavours are used in many brands. Most NZ (mainly Virginia tobacco) brands of cigarettes require little sugar as casing, as this type of tobacco contains much natural sugar which is by definition not an ingredient. Whatever the method currently used in manufacture, surviving older smokers attest that cigarettes would be more palatable to new smokers today than was the case 50 years ago.

Duty-free sales. Duty-free sales reported in past years suggest that the end to this practice in 2014 was long overdue.

Hazard monitoring
RYO testing is not required by the Smoke-free Environments Act, although RYOs accounted for 33.5% of all cigarettes smoked.

Smoke machine nicotine and tar yields are still tested and reported, though no longer required to be printed on the packet – changed because these values were misleading to smokers.

Nicotine content is probably the best chemical measure of addictiveness of a tobacco product for smoking, Manufacturers have never disclosed nicotine content on the pack to their customers, or even to regulators, and without such information smokers can never know which cigarettes to smoke should they wish to reduce their addiction to smoking. Nor has any government required manufacturers to print nicotine content on all tobacco packages.

The Smoke-free Environments Act contains the necessary powers for regulations, which would logically apply to all tobacco products.

Conclusion

For the long term trend 2010-15, the average decrease in tobacco consumption per adult was 5% per year, or 25% overall. (Table 7).

Consumption per adult decreased 2.6% for FMs in tonnage, while RYOs increased 4.0% in tonnage.

Factory-made cigarette consumption per adult decreased 4.6% in 2015, while price increased by 8.4% and excise increased by 11.3%.
RYOs sales per adult decreased 5.9% in 2015, while RYOs increased their price by 15.4% and the excise by 11.0%. (Table E6, H2.)

Harm proportional to number of cigarettes and type of cigarettes smoked: tax implications.
Research shows that 0.5 g tobacco is the average normal weight for RYO smokers, and that this RYO 0.5g cigarettes results in 28% extra smoke being inhaled more than from a FM cigarettes of 0.7g.

RYO smokers rolling less tobacco per cigarette may increase the harm because more toxic smoke is inhaled per gram. Surveys show RYO smokers roll between 0.4 and 0.5 g tobacco per cigarette[2] Smoking RYOs of 0.5g per cigarette smoked has been found to increase smoke inhalation by 28 percent per cigarette compared with 0.7 g factory-made cigarettes, and carbon monoxide inhaled is no less than from factory made cigarettes containing 0.7 g tobacco.[2]

Hand-rolled cigarettes in 2014 accounted for 30% of all standard cigarettes smoked (as measured in dry tobacco in Table 1) and 30% of all tobacco moist weight smoked is cigarette tobacco for RYO smoking (Table E1). If we assumed that smokers use 0.5 g to roll a RYO cigarette, then 43% of cigarettes smoked in 2014 would be RYO. Smokers certainly smoke more cigarettes (albeit rolled thinner on average) than estimated by traditional assumptions of 1 g tobacco per RYO cigarette.

Reduction in smoking due to non-price factors From 2001 to 2008 sales per adult decreased 9%. This reduction was achieved without help of any tobacco tax increase, and was achieved despite the availability of relatively cheap RYO cigarettes. The new factors in this period were the Quitline, publicity and warnings about health effects, and the legislation extending smokefree protection to non-smokers.

Cigar use is static and dominated by cigarillos. Cigar use peaked in 2000 at 24 tonnes used and has since hovered at a lower level. The average tobacco per cigar is very low, under 2 g, and cigarillos predominate.

Electronic cigarettes. This report did not ask for information on consumption of electronic cigarettes which do not contain tobacco.

Low nicotine cigarettes. This report did not ask for information on their consumption.

Glossary

Additive	Non-tobacco content of a tobacco product. Includes menthol.
BAT	British American Tobacco, a multinational tobacco company.
Brand variant	Brand subtype differing by filter, pack size, flavour, packaging etc..
CO	Carbon monoxide, a constituent gas in all cigarette, cigar, and pipe smoke.
Content	With respect to nicotine, the amount contained in the unburnt cigarette at retail.
FM	Factory-made cigarette, manufactured, or tailor-made cigarette.
GST	Goods and services tax, increased on 1 October 2010 from 12.5% to 15%.
ISO	International Standards Organisation (defines method of testing cigarette emissions from machine smoking).
Loose tobacco	Pipe and RYO manufactured tobacco.
Nicotine	The main addictive agent in tobacco products and in their smoke.
PM	Philip Morris, a multinational cigarette company.
RRP	Recommended retail price.
RYO	Roll your own or hand-rolled fine-cut tobacco smoked as a cigarette.
Sticks	One cigarette or one cigar counts as one stick.
STG	Scandinavian Tobacco Group, replacing Swedish Match.
Tar	The solids collected on filter paper when smoke passes through a smoking machine.
Yield	Smoke constituent as measured by smoke machine (not the same as amount inhaled).

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