

Changes in the affordability of tobacco products in India during 2007/2008 to 2017/2018: a price-relative-to-income analysis

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Abstract

Background Increasing the price of tobacco through taxation is a very effective means of reducing tobacco use. However, the impact of price increases can be diluted if consumer incomes are growing strongly. The affordability of tobacco products has, therefore, become an important indicator for tobacco control. This study asks whether tobacco products in India became more or less affordable during 2007/2008 to 2017/2018.

Methods Survey data on the retail price of chewing tobacco, bidis and cigarettes were used to measure affordability at state and national levels. We adapted the price relative to income measure by calculating the percentage of net state domestic product (NSDP) per capita needed to purchase 1000 g of tobacco in each form and then calculating the average annual percentage change (AAPC) in affordability. We used ordinary least squares regression analysis to test for any changes.

Results In 2017/2018, it took 1.72% and 1.18% of NSDP/capita to purchase 1000 g of tobacco in the form of bidis and chewing tobacco respectively. The affordability of bidis remained unchanged, while chewing tobacco became more affordable (AAPC = -1.83%, 95% confidence interval -2.87 to -0.80, $P = 0.003$). For cigarettes, it took 7.56% of NSDP/capita to purchase 1000 g of tobacco in 2017/2018; although affordability decreased in many states, national average affordability was unchanged.

Conclusion Tobacco products, especially indigenous forms such as bidis and chewing tobacco, have not become measurably less affordable over the past decade. India should raise taxes on all tobacco products to significantly reduce the affordability of these products and to promote public health.

Keywords: affordability, India, relative income price, taxation, tobacco

Background

Increasing the price of tobacco products through taxation is known to be one of the most effective means of reducing tobacco use.¹ Tobacco taxation is, therefore, a key demand reduction measure under the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) as well as in the WHO MPOWER package country-level interventions for tobacco control.^{2,3} However, the impact of tax and price increases can be diluted if consumer incomes are growing strongly, as is the case in many low- and middle-income countries. The affordability of tobacco products has, therefore, gained importance as an indicator of the effectiveness of taxation for the purposes of tobacco control.⁴

The affordability concept is intuitively appealing because it combines two key economic determinants of tobacco consumption: the price and income elasticities of demand. The former interacts with price increases leading to reduced

consumption. In many countries, tobacco products are still viewed by consumers as normal or luxury goods; therefore, income growth will lead to increased tobacco consumption owing to positive income elasticity of demand. Available evidence from India confirms that this is indeed the case at least for cigarettes.^{4,5}

The affordability of tobacco products has been measured in several ways. Guindon et al. (2002) used the minutes of labour required to purchase a pack of cigarettes as a measure of affordability.⁶ Blecher and Walbeek (2004) expanded on this approach by calculating affordability in terms of the percentage of gross domestic product (GDP) per capita required to purchase 100 packs of cigarettes.^{7,8} This relative income price (RIP) approach has become the standard measure of affordability.⁴ In an interesting development, Nargis et al (2018) measured affordability based on the ratio of self-reported price and income variables derived from a survey of tobacco users in Bangladesh.⁹

In the Indian context, however, there is a wide variety of tobacco products on offer. Cigarette use is relatively low compared with use of indigenous tobacco products such as khaini (chewing tobacco) and bidis. For example, the latest Global Adult Tobacco Survey (GATS) for India, in 2016–2017, found that India has around 38 million cigarette smokers compared with around 72 million bidi smokers and more than 199 million users of smokeless tobacco products, including 104 million users of chewing tobacco.¹⁰ To put those figures in context, 28.6% of adults in India use tobacco in some form, with 10.7% and 21.4% using smoked and smokeless tobacco products respectively.¹⁰

In this paper, we adapt the RIP measure to reflect the Indian context by calculating the retail price paid by consumers for 1000 g of tobacco contained in three key tobacco products: chewing tobacco, bidis and cigarettes. The paper uses data from existing surveys to monitor the change in affordability of these products at state and national levels over the past decade. The findings can inform policy-makers about the effectiveness of tobacco tax policies from a wider tobacco control and public health perspective.

Methods

We adapted the RIP measure by calculating the retail price paid by consumers for 1000 g of tobacco contained in three key tobacco products: chewing tobacco, bidis and cigarettes. Specifically, the RIP for each product was measured as the equivalent retail price (RP) of 1000 g of tobacco in each product as a percentage of net state domestic product (NSDP) per capita. NSDP is the conceptual equivalent of GDP at state level across India, with the latter being available only at national level.¹¹

Data on the retail price of each tobacco product in March of each fiscal year from 2007/2008 to 2017/2018 were sourced from the Labour Bureau's Consumer Price Index for Industrial Workers.¹² Pack sizes for each product varied among states in this database, and therefore retail prices were first converted into prices for standard pack sizes in the Indian market: 25 bidis, 10 g of chewing tobacco and 10 cigarettes (see Annex Tables 1–3 at the end of this paper). For some states, there were price data for more than one brand or location, and in these cases we calculated a simple average retail price for each of the three product categories.

The prices of these standard packs were then converted into an equivalent retail price per 1000 g of tobacco content, based on the standard that each cigarette contains 0.65 g of tobacco, each bidi contains 0.33 g of tobacco and each 10 g chewing tobacco pouch contains 3.5 g of tobacco.¹³ The cigarette brands on which there were data in the Labour Bureau's database fall into the shorter than 69 mm category, which is why we adopted 0.65 g per cigarette rather than the more common international standard of 0.75 g per king-size (84 mm) cigarette.¹² The conversion from standard pack size to retail price per 1000 g does not affect the affordability results, but it highlights the large absolute difference in the price of different tobacco products.

Overall, there were sufficient data to complete estimates for 23 states across India, with these states accounting for more than 95% of India's national population according to the 2011

census.¹⁴ Population data for each state from this census were also used also to calculate national weighted average price and affordability estimates for each product. We used population data rather than number of tobacco users for weighting purposes because price and affordability are concepts relevant to both users and non-users of tobacco (i.e. non-users include those who might otherwise initiate or resume tobacco use).

Data on NSDP/capita in current prices for each fiscal year were sourced from the Reserve Bank of India (Annex Table 4).¹¹ For the sake of consistency, 2011 census population data were also used to calculate national weighted average NSDP/capita. A clear limitation of this approach is that the same denominator – NSDP/capita – is applied to all three tobacco products in each state. This is despite the expectation that cigarette smokers will tend to have higher incomes than users of bidis or chewing tobacco. Therefore, we refrain from making definitive statements about the ranking or ordering of the products in terms of affordability. Our approach does, however, add value by standardizing the numerator – retail prices – which further highlights the large and widening difference in pricing between cigarettes and indigenous tobacco products.

To assess whether or not affordability has changed on average between 2007/2008 and 2017/2018, the average annual percentage change (AAPC) in affordability was calculated based on the least squares growth rate for each product in each state.⁴ In keeping with standard practice, the AAPC was estimated as the coefficient β from a regression where $\ln(\text{RIP})$ is the natural logarithm of affordability and t is time: $\ln(\text{RIP}) = \alpha + \beta t + \epsilon$.

The change in affordability for each product in each state was tested for statistical significance using the ordinary least squares regression tool available in Microsoft's Visual Basic for Applications package. Confidence intervals and P values are reported in Table 3 with $P < 0.05$ being designated as statistically significant.

Results

Table 1 shows the average retail price for a standard size pack of bidis, chewing tobacco and cigarettes in each state for 2016/2017 and 2017/2018. India's Goods and Services Tax (GST) was introduced in July 2017 and the prices shown in Table 1 reflect the situation both pre and post GST.

In 2017/2018, the retail price of bidis averaged ₹ 16.3/pack nationally, with Bihar recording the lowest price of ₹ 8.8/pack and Kerala recording the highest price of ₹ 27.1/pack. The database contains information on a large number of local or subnational bidi brands, with only Ganesh being identifiable as a bidi brand with national reach. The retail price of Ganesh averaged ₹ 18.9/pack, within a range of ₹ 15–20/pack. In nominal terms (i.e. without accounting for inflation), the average retail price of bidis increased by ₹ 1.9/pack or 13% from 2016/2017 to 2017/2018. The biggest increase occurred in Chandigarh, while the price of bidis remained unchanged in Bihar and Chhattisgarh.

The retail price of chewing tobacco averaged ₹ 4.8/pack nationally in 2017/2018, with Madhya Pradesh recording the lowest price at ₹ 2.0/pack and Gujarat recording the highest price at ₹ 7.9/pack. The retail price of chewing tobacco increased by ₹ 0.2/pack or 4% nationally from 2016/2017 to

Table 1. Nominal prices of tobacco products by state/union territory

State/union territory	Bidis (₹ per 25 bidis)			Chewing tobacco (₹ per 10 g)			Cigarettes (₹ per 10 cigarettes)		
	2016/2017	2017/2018	Change	2016/2017	2017/2018	Change	2016/2017	2017/2018	Change
Andhra Pradesh	16.5	19.7	3.2	2.8	4.0	1.2	47.3	53.8	6.5
Assam	12.8	15.1	2.3	6.8	7.1	0.3	37.4	39.6	2.2
Bihar	8.8	8.8	0.0	4.4	4.4	0.0	50.0	58.0	8.0
Chandigarh	10.4	20.0	9.6	n/a	n/a	n/a	58.0	64.0	6.0
Chhattisgarh	16.0	16.0	0.0	4.5	4.5	0.0	51.8	64.7	12.9
Delhi	14.0	16.0	2.0	n/a	n/a	n/a	59.0	64.0	5.0
Goa	15.0	22.5	7.5	n/a	n/a	n/a	58.0	61.3	3.3
Gujarat	17.6	19.8	2.2	6.5	7.9	1.4	51.8	64.7	12.9
Haryana	12.2	14.3	2.1	4.2	4.2	0.0	69.0	74.5	5.5
Himachal Pradesh	8.0	10.8	2.8	n/a	n/a	n/a	58.0	64.0	6.0
Jammu and Kashmir	n/a	n/a	n/a	n/a	n/a	n/a	40.0	41.7	1.7
Jharkhand	8.6	10.3	1.7	4.3	4.5	0.1	48.8	58.0	9.2
Karnataka	17.1	19.6	2.4	6.7	6.7	0.0	45.5	51.6	6.1
Kerala	19.9	27.1	7.2	n/a	n/a	n/a	45.5	49.6	4.1
Madhya Pradesh	17.8	19.0	1.3	2.0	2.0	0.0	50.9	64.7	13.8
Maharashtra	16.8	17.6	0.8	4.2	4.7	0.5	49.9	59.8	9.9
Odisha	10.0	12.0	2.0	4.2	4.2	0.0	48.0	48.5	0.5
Puducherry	15.6	20.8	5.2	2.5	2.5	0.0	52.4	59.8	7.5
Punjab	15.3	16.3	1.0	5.0	4.5	-0.5	59.0	64.0	5.0
Rajasthan	17.3	19.0	1.7	7.2	5.5	-1.7	58.3	64.3	6.0
Tamil Nadu	21.5	24.9	3.4	n/a	n/a	n/a	52.4	64.1	11.7
Uttar Pradesh	12.7	14.5	1.9	n/a	n/a	n/a	49.8	50.4	0.6
West Bengal	8.4	10.3	1.8	4.0	4.1	0.1	45.5	46.7	1.2
India (average)	14.4	16.3	1.9	4.6	4.8	0.2	50.1	56.4	6.3

n/a: not available.

Source: Consumer Price Index for Industrial Workers.¹²

2017/2018 in nominal terms. The price of chewing tobacco fell in Punjab and Rajasthan, and it remained unchanged in a number of states.

In 2017/2018, the retail price of cigarettes averaged ₹ 56.4/pack nationally, with Assam recording the lowest price at ₹ 39.6/pack and Haryana recording the highest price at ₹ 74.5/pack. Although many of the brands for which information was included in the database are local or subnational brands, they are all in the shorter than 69 mm category and therefore subject to the same level of taxation in the post-GST period. It should be noted that there are higher priced cigarettes available in India and therefore the survey data do not provide a full picture of the price range across all cigarettes. The retail price of cigarettes shorter than 69 mm increased by ₹ 6.3/pack or 13% nationally from 2016/2017 to 2017/2018 in nominal terms. Relatively large price increases occurred in Chhattisgarh, Gujarat, Madhya Pradesh and Tamil Nadu, while cigarette prices remained largely unchanged in Odisha.

Table 2 shows the average retail prices of bidis, chewing tobacco and cigarettes in real, or inflation-adjusted, prices. The real price of bidis increased by ₹ 6.0/pack or 58% from 2007/2008 to 2017/2018, while the real price of cigarettes

increased by ₹ 20.6/pack, also a 58% increase. The real price of chewing tobacco increased the least, by just ₹ 1.5/pack or by 45%.

In 2017/2018, the retail price paid by consumers for 1000 g of tobacco contained in cigarettes is estimated at ₹ 8679/1000 g, compared with ₹ 1978/1000 g and 1357/1000 g for bidis and chewing tobacco respectively. This highlights the large absolute price differential between manufactured cigarettes and indigenous tobacco products in India.

Table 3 shows the affordability of each tobacco product at state and national levels in 2007/2008 and 2017/2018. For example, it took a national average of 1.72% of NSDP/capita to purchase 1000 g of tobacco contained in bidis in 2017/2018. Bidis were most affordable in Delhi, where it took just 0.59% of NSDP/capita to purchase 1000 g, and least affordable in Uttar Pradesh, where it took 3.18% of NSDP/capita.

Just three states (Kerala, Punjab and Tamil Nadu) recorded a statistically significant ($P < 0.05$) decrease in the affordability of bidis over the relevant period, while six states (Assam, Himachal Pradesh, Karnataka, Madhya Pradesh, Odisha and Rajasthan) recorded statistically significant increases in the affordability of bidis. Nationally, bidis became more affordable between 2007/2008 and 2017/2018, with the percentage

Table 2. Real prices of tobacco products (national averages in constant 2017/2018 prices)

Year	Bidis		Chewing tobacco		Cigarettes	
	₹ per 25 bidis	₹ per 1000 g	₹ per 10 g	₹ per 1000 g	₹ per 10 cigarettes	₹ per 1000 g
2007/2008	10.3	1251	3.3	937	35.8	5508
2008/2009	10.1	1219	3.7	1044	33.7	5178
2009/2010	10.3	1248	3.8	1094	33.1	5097
2010/2011	10.7	1301	4.1	1170	37.9	5834
2011/2012	11.6	1411	4.2	1213	37.3	5737
2012/2013	12.5	1517	4.3	1223	40.7	6261
2013/2014	12.9	1561	4.5	1276	45.1	6932
2014/2015	13.5	1640	4.6	1323	53.0	8156
2015/2016	14.2	1721	4.6	1321	54.0	8309
2016/2017	15.1	1828	4.8	1372	52.5	8079
2017/2018	16.3	1978	4.8	1357	56.4	8679

of NSDP per capita reducing from 1.81% to 1.72%, but this change was not statistically significant ($P = 0.176$).

It took just 1.18% of NSDP/capita to purchase 1000 g of tobacco contained in chewing tobacco in 2017/2018. Chewing tobacco was most affordable in Puducherry, where it took just 0.36% of NSDP/capita to purchase 1000 g of tobacco, and least affordable in Bihar, where it took 3.24% of NSDP/capita. The results show that no states recorded a significant decrease in the affordability of chewing tobacco during 2007/2018, while five states (Haryana, Karnataka, Madhya Pradesh, Maharashtra and Odisha) recorded significant increases in the affordability of chewing tobacco. At national level, chewing tobacco showed a significant increase in affordability (-1.83%) between 2007/2008 and 2017/2018 ($P = 0.003$).

With respect to cigarettes, 7.56% of NSDP/capita was needed to purchase 1000 g of tobacco in 2017/2018. Cigarettes also show the greatest range, with 1000 g of tobacco in cigarettes in Goa requiring just 2.24% of NSDP/capita but 22.96% of NSDP/capita in Bihar. The latter figure is a function of both low NSDP/capita and relatively high cigarette prices. Overall, six states (Chandigarh, Haryana, Jharkhand, Maharashtra, Puducherry and Punjab) recorded significant decreases in the affordability of cigarettes between 2007/2008 and 2017/2018, while only Karnataka recorded a significant increase in cigarette affordability.

Table 4 shows the change in the affordability of these three tobacco products nationally over the period in question. The affordability of bidis shows very little change, with only three decreases, including most recently in 2017/2018 after GST was implemented. On the other hand, the affordability of chewing tobacco has tended to increase.

In contrast, the general change for cigarettes was for them to become less affordable, peaking at 8.46% of NSDP/capita in 2014/2015. However, these gains have largely been reversed in the most recent years, and the overall change is not statistically significant. Generally speaking, tobacco products have *not* become less affordable in India, and this is especially the case for indigenous products such as bidis and chewing

tobacco. There is also a stark difference in the absolute price of cigarettes compared with these indigenous tobacco products.

Discussion

In India and throughout the world, tobacco use is increasingly concentrated among poorer and less educated populations.^{1,4} In India, high rates of tobacco use – higher than 30% of the adult population – occur only in lower income states such as Assam and Odisha where NSDP is still below ₹ 100,000/capita.^{10,11} This partly reflects a kind of benign neglect among policy-makers, who are often reluctant to raise taxes and the prices of indigenous tobacco products because they are typically consumed by the poor. However, such neglect also makes the health burden of tobacco use more entrenched in poorer populations, which in turn increases poverty and health inequity.

India has made significant progress in reducing the number of people living in extreme poverty in the past two decades.¹⁵ The government has also launched a number of major initiatives – such as the recently announced national health protection scheme – Ayushman Bharat – designed to reduce inequity in health.¹⁶ While such initiatives are clearly to be applauded, there is also a need to ensure greater policy coherence across the whole of government. That is, allowing tobacco use, as a major risk factor for cancer and other diseases, to become more concentrated in poorer populations is inconsistent with India's wider development objectives.

Taxation is a critical intervention from the standpoint of tobacco control and is also closely tied to the concept of affordability. India completed a major tax reform through the introduction of its national GST regime in July 2017.¹⁷ This regime replaced the old subnational value added tax (VAT) system, as well as many other sources of tax revenue including central excise duty. GST is levied at the highest rate of 28% on all tobacco products, with an additional compensation cess being levied on cigarettes and smokeless tobacco products

Table 3. The affordability of 1000 g of tobacco in the form of bidis, chewing tobacco and cigarettes by state/union territory between 2007/2008 and 2017/2018

State/union territory	Bidis (% NSDP/capita)				Chewing tobacco (% NSDP/capita)				Cigarettes (% NSDP/capita)			
	2007/2008	2017/2018	AAPC (95% CI)	P value	2007/2008	2017/2018	AAPC (95% CI)	P value	2007/2008	2017/2018	AAPC (95% CI)	P value
Andhra Pradesh	1.65	1.70	0.24 (-1.47 to 1.95)	0.759	0.72	0.81	-0.63 (-5.80 to 4.55)	0.790	6.25	5.89	-0.11 (-1.35 to 1.14)	0.851
Assam	2.85	2.45	-1.66 (-3.00 to -0.33)	0.020	2.62	2.71	-1.38 (-6.19 to 3.42)	0.532	9.25	8.15	-2.05 (-4.66 to 0.55)	0.109
Bihar	4.39	2.73	-2.7 (-6.23 to 0.82)	0.117	2.07	3.24	2.54 (-0.85 to 5.93)	0.124	24.36	22.96	0.86 (-1.80 to 3.52)	0.483
Chandigarh	0.54	0.95	1.03 (-3.73 to 5.80)	0.635	n/a				2.84	3.84	4.28 (2.62 to 5.94)	0.000
Chhattisgarh	2.48	2.11	-0.18 (-1.77 to 1.41)	0.801	1.22	1.40	2.92 (-6.63 to 12.46)	0.507	9.95	10.81	1.40 (-0.94 to 3.74)	0.209
Delhi	0.64	0.59	-1.04 (-2.36 to 0.28)	0.107	n/a				3.07	2.99	1.46 (-0.98 to 3.91)	0.209
Goa	0.60	0.65	0.07 (-2.68 to 2.82)	0.955	n/a				2.69	2.24	0.53 (-3.25 to 4.31)	0.758
Gujarat	1.38	1.38	-0.21 (-0.79 to 0.36)	0.423	0.90	1.30	1.12 (-1.64 to 3.89)	0.381	5.86	5.73	-0.16 (-1.44 to 1.13)	0.790
Haryana	0.95	0.86	-0.62 (-2.45 to 1.20)	0.460	0.78	0.60	-3.24 (-6.13 to -0.35)	0.032	3.24	5.73	10.40 (5.14 to 15.65)	0.002
Himachal Pradesh	0.96	0.81	-3.56 (-6.02 to -1.11)	0.009	n/a				6.65	6.13	0.70 (-1.32 to 2.72)	0.453
Jammu and Kashmir	n/a				n/a				10.65	7.46	-2.12 (-4.49 to 0.25)	0.073
Jharkhand	1.80	1.97	-0.7 (-3.02 to 1.63)	0.517	2.23	2.00	-1.54 (-3.68 to 0.59)	0.136	10.86	14.00	2.66 (0.27 to 5.04)	0.033
Karnataka	1.70	1.36	-3.1 (-4.62 to -1.58)	0.001	2.25	1.09	-6.48 (-9.09 to -3.87)	0.000	6.02	4.55	-2.50 (-4.75 to -0.26)	0.033
Kerala	1.44	1.79	2.01 (0.26 to 3.76)	0.028	n/a				5.12	4.17	-0.77 (-2.85 to 1.30)	0.421
Madhya Pradesh	3.40	2.83	-1.28 (-2.24 to -0.32)	0.015	0.96	0.70	-2.62 (-4.66 to -0.58)	0.017	13.96	12.23	-0.86 (-2.44 to 0.72)	0.248
Maharashtra	1.27	1.18	-0.17 (-1.00 to 0.66)	0.652	0.90	0.74	-4.27 (-7.46 to -1.08)	0.014	4.57	5.09	1.47 (0.04 to 2.90)	0.045
Odisha	1.86	1.80	-0.98 (-1.69 to -0.27)	0.012	2.86	1.47	-6.04 (-9.19 to -2.89)	0.002	9.71	9.21	1.05 (-1.20 to 3.30)	0.318
Puducherry	1.02	1.27	1.56 (-0.19 to 3.30)	0.074	0.39	0.36	-1.46 (-3.95 to 1.04)	0.220	2.07	4.65	12.15 (5.70 to 18.59)	0.002
Punjab	1.16	1.40	2.6 (1.47 to 3.72)	0.001	1.08	0.91	-1.90 (-5.73 to 1.92)	0.290	5.92	6.99	3.37 (1.46 to 5.28)	0.003
Rajasthan	2.78	2.29	-1.78 (-2.58 to -0.97)	0.001	1.59	1.56	0.74 (-3.71 to 5.20)	0.714	10.87	9.84	0.57 (-1.58 to 2.72)	0.562
Tamil Nadu	1.57	1.81	1.35 (0.07 to 2.64)	0.041	n/a				5.34	5.90	1.80 (-0.07 to 3.66)	0.057
Uttar Pradesh	2.96	3.18	0.94 (-0.77 to 2.64)	0.247	n/a				16.26	14.01	0.39 (-1.51 to 2.29)	0.651
West Bengal	1.42	1.30	-0.76 (-1.66 to 0.13)	0.086	1.61	1.22	-1.07 (-2.88 to 0.75)	0.216	8.53	7.52	0.53 (-1.41 to 2.47)	0.551
India (average)	1.81	1.72	-0.35 (-0.89 to 0.19)	0.176	1.35	1.18	-1.83 (-2.87 to -0.80)	0.003	7.96	7.56	0.50 (-1.02 to 2.02)	0.472

AAPC: average annual percentage change; CI: confidence interval; n/a: not available; NSDP: net state domestic product.

Table 4. The affordability of tobacco products, national averages from 2007/2008 to 2017/2018

Year	(% NSDP/capita)		
	Bidis	Chewing tobacco	Cigarettes
2007/2008	1.81	1.35	7.96
2008/2009	1.75	1.50	7.43
2009/2010	1.72	1.51	7.05
2010/2011	1.66	1.50	7.47
2011/2012	1.64	1.41	6.66
2012/2013	1.71	1.38	7.08
2013/2014	1.67	1.37	7.42
2014/2015	1.70	1.37	8.46
2015/2016	1.70	1.30	8.19
2016/2017	1.68	1.26	7.43
2017/2018	1.72	1.18	7.56

but not on bidis. The cess was introduced with the aim of compensating state governments for any potential revenue losses under GST over a 5-year transition period.¹⁸

Under the old subnational system, rates of VAT varied considerably across state jurisdictions. For example, VAT on cigarettes ranged from 13.5% in Manipur to 65% in Rajasthan.¹⁸ Similarly, VAT on bidis ranged from nil (0%) in a number of states such as Karnataka and West Bengal up to 65% in Rajasthan. These variations led to some concern about the interstate smuggling of tobacco products, a concern that should now have been eased by the introduction of the national GST system.

Nonetheless, as is evident from Table 1, there remains considerable variation in the retail prices of tobacco products across states under GST. This presumably reflects an element of pricing to market by producers based on differences in state income levels. Interestingly, the price of cigarettes and bidis still increased in what were high-VAT states such as Madhya Pradesh and Rajasthan. Furthermore, there is little evidence of any large retail price increases for bidis in what were low-VAT states such as Karnataka and West Bengal. This argues in favour of applying specific rather than *ad valorem* tax rates to low-price products such as bidis in order to ensure that prices are pushed up and to reduce affordability.

The compensation cess initially replaced central excise duty during the transition period. In this sense, it should perform similar functions in terms of *both* generating revenue and promoting public health by discouraging tobacco consumption. For example, bidis should be subject to a cess to discourage consumption. The Government of India reintroduced excise on all tobacco products at nominal levels in the 2019 budget, and then increased the rates on cigarettes and smokeless tobacco products in the most recent 2020 budget.¹⁹ These taxes should be increased annually and at high enough levels to reduce the affordability of all tobacco products, including bidis.

At the same time, the government needs to regulate the supply chain for low-priced tobacco products such as bidis, chewing tobacco and other smokeless tobacco products in order to make tax increases even more effective. India has acceded to the WHO FCTC Protocol to Eliminate Illicit Trade in Tobacco Products and therefore has already committed

to implementing measures to better secure the supply chain for tobacco products.²⁰ With respect to indigenous tobacco products, this may require India to develop and adopt new measures, for example with some subnational jurisdictions piloting vendor licensing schemes.²¹

There is a very strong public health justification for India implementing such tax and supply-chain measures. For example, the most recent GATS for India, in 2016–2017, found that tobacco control efforts have been less successful in tackling use of indigenous tobacco products than in reducing use of cigarettes.¹⁰ Indeed, the absolute number of chewing tobacco users had increased since the data for the first round of GATS were collected in 2009–2010. The continuing affordability of these products has undoubtedly been a contributing factor.

Conclusion

Unfortunately, tobacco products have *not* become less affordable in India over the past decade, and there remains a stark difference in the absolute price of cigarettes compared with indigenous tobacco products such as bidis and chewing tobacco. India should raise taxes on all tobacco products to significantly reduce the affordability of these products and to promote public health.

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Annex Table 1. The retail price of bidis, ₹ per 25 bidis

State/union territory	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Andhra Pradesh	5.4	6.2	6.8	7.9	9.9	12.2	13.3	14.3	14.1	16.5	19.7
Assam	5.0	5.4	6.1	6.5	7.6	8.5	9.3	10.2	11.6	12.8	15.1
Bihar	4.0	4.0	5.0	5.0	5.0	5.0	6.0	8.8	8.8	8.8	8.8
Chandigarh	4.6	4.6	7.5	7.5	7.5	8.3	8.9	7.8	10.4	10.4	20.0
Chhattisgarh	6.0	5.8	7.0	8.0	10.0	12.0	13.0	14.0	16.0	16.0	16.0
Delhi	5.0	5.5	6.0	8.0	9.0	10.0	10.0	11.0	13.0	14.0	16.0
Goa	5.4	6.5	7.0	8.0	10.0	12.0	12.5	15.0	15.0	15.0	22.5
Gujarat	5.7	6.3	7.1	8.7	9.7	11.6	13.0	13.7	14.7	17.6	19.8
Haryana	4.4	5.4	5.7	5.9	6.8	9.4	9.6	10.0	12.2	12.2	14.3
Himachal Pradesh	3.5	4.3	5.0	5.0	5.3	6.0	8.4	8.0	8.0	8.0	10.8
Jammu and Kashmir	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jharkhand	3.7	4.2	4.6	4.9	5.3	6.3	6.6	7.0	7.7	8.6	10.3
Karnataka	6.0	6.5	7.0	8.8	9.9	11.9	13.0	13.8	14.6	17.1	19.6
Kerala	5.6	6.0	6.9	8.2	10.0	12.1	14.1	16.2	19.9	19.9	27.1
Madhya Pradesh	5.9	6.4	7.3	9.0	9.8	12.3	13.3	14.5	15.3	17.8	19.0
Maharashtra	6.1	6.4	7.4	8.1	10.0	12.0	12.8	13.8	15.8	16.8	17.6
Odisha	4.3	4.8	5.3	6.0	7.5	8.0	9.0	9.0	9.5	10.0	12.0
Puducherry	6.3	6.8	8.3	8.3	10.9	13.5	14.6	15.0	15.6	15.6	20.8
Punjab	4.7	4.7	6.2	7.6	9.0	10.4	11.6	12.3	13.9	15.3	16.3
Rajasthan	6.2	6.5	7.3	9.7	11.0	13.0	13.3	15.0	15.3	17.3	19.0
Tamil Nadu	6.2	7.6	7.6	9.4	13.0	14.9	16.0	17.3	19.5	21.5	24.9
Uttar Pradesh	4.3	4.9	5.3	5.3	6.7	8.0	8.6	9.5	11.3	12.7	14.5
West Bengal	3.7	4.0	4.6	4.8	5.9	6.4	7.1	7.8	8.2	8.4	10.3
India (average)	5.1	5.5	6.2	7.1	8.5	9.9	10.8	11.9	13.1	14.4	16.3

n/a: not available.

Source: authors' estimates using data from the Consumer Price Index for Industrial Workers.¹²

Annex Table 2. The retail price of chewing tobacco, ₹ per 10 g

State/union territory	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Andhra Pradesh	1.0	1.0	2.0	1.6	3.2	2.5	2.9	2.8	2.8	2.8	4.0
Assam	2.0	3.6	3.6	3.4	3.5	3.3	3.9	6.6	6.8	6.8	7.1
Bihar	0.8	1.6	2.0	2.4	2.4	3.0	3.0	3.8	4.0	4.4	4.4
Chandigarh	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chhattisgarh	1.3	1.3	1.3	2.8	7.0	6.8	6.8	4.5	4.5	4.5	4.5
Delhi	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Goa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Gujarat	1.6	2.5	2.8	3.6	4.4	4.9	4.9	6.1	5.6	6.5	7.9
Haryana	1.5	2.4	2.6	2.9	3.1	3.3	3.5	5.2	4.2	4.2	4.2
Himachal Pradesh	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jammu and Kashmir	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jharkhand	1.9	2.2	2.4	2.5	2.5	3.1	3.7	3.9	3.9	4.3	4.5
Karnataka	3.3	3.0	3.1	4.7	4.4	4.8	6.9	5.7	6.1	6.7	6.7
Kerala	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Madhya Pradesh	0.7	0.9	0.9	1.0	1.0	1.6	1.6	1.8	1.8	2.0	2.0
Maharashtra	1.8	2.5	2.5	2.5	2.9	2.5	2.6	3.2	3.7	4.2	4.7
Odisha	2.8	2.8	2.5	2.5	2.5	2.8	3.3	3.3	3.3	4.2	4.2
Puducherry	1.0	1.5	1.5	1.5	1.6	2.0	2.0	2.5	2.5	2.5	2.5
Punjab	1.9	2.3	3.4	3.3	2.5	3.7	3.5	4.2	5.0	5.0	4.5
Rajasthan	1.5	2.0	2.7	4.3	4.5	6.2	6.2	6.2	7.2	7.2	5.5
Tamil Nadu	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uttar Pradesh	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
West Bengal	1.8	1.9	2.0	2.2	2.3	2.6	3.3	3.8	3.8	4.0	4.1
India (average)	1.6	2.0	2.3	2.7	3.1	3.4	3.8	4.1	4.3	4.6	4.8

n/a: not available.

Source: authors' estimates using data from the Consumer Price Index for Industrial Workers.¹²**Annex Table 3.** The retail price of cigarettes, ₹ per 10 cigarettes

State/union territory	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Andhra Pradesh	16.2	18.3	20.9	23.6	26.5	32.6	37.2	40.2	47.0	47.3	53.8
Assam	12.8	19.6	19.6	21.3	22.4	23.6	30.2	36.5	37.4	37.4	39.6
Bihar	17.5	20.0	20.0	25.0	28.0	29.0	34.0	49.0	50.0	50.0	58.0
Chandigarh	19.0	19.0	20.0	25.0	28.0	37.0	45.0	54.0	54.0	58.0	64.0
Chhattisgarh	19.0	19.0	20.0	28.0	28.0	35.0	39.0	50.0	53.9	51.8	64.7
Delhi	19.0	19.0	20.0	28.0	28.0	45.0	45.0	54.0	54.0	59.0	64.0
Goa	19.0	20.0	20.0	28.0	30.0	45.0	45.0	51.8	54.0	58.0	61.3
Gujarat	19.1	19.8	23.4	28.0	28.6	35.0	39.8	49.4	52.0	51.8	64.7
Haryana	12.0	12.0	13.3	13.3	17.3	25.4	45.0	56.0	69.0	69.0	74.5
Himachal Pradesh	19.0	19.0	20.0	25.0	29.0	37.0	47.0	55.0	55.0	58.0	64.0
Jammu and Kashmir	19.0	19.0	19.0	25.0	25.0	33.0	38.0	40.0	40.0	40.0	41.7
Jharkhand	17.5	18.8	19.3	23.5	25.7	29.5	34.7	45.3	48.8	48.8	58.0
Karnataka	16.6	16.6	18.2	23.8	24.0	29.8	33.2	41.0	45.4	45.5	51.6
Kerala	15.6	15.7	16.7	25.0	27.7	33.6	35.9	45.5	45.5	45.5	49.6
Madhya Pradesh	19.0	19.3	23.0	27.3	28.8	35.0	41.5	48.0	51.2	50.9	64.7
Maharashtra	17.1	18.0	20.7	23.9	26.0	32.3	38.4	44.7	49.8	49.9	59.8
Odisha	17.5	19.0	19.0	24.5	27.0	30.0	35.0	48.5	47.5	48.0	48.5
Puducherry	10.0	10.0	10.0	10.0	10.0	30.0	30.0	39.2	52.4	52.4	59.8
Punjab	19.0	19.3	20.0	27.0	30.3	40.3	45.7	55.0	54.7	59.0	64.0
Rajasthan	19.0	19.0	20.6	29.0	29.6	37.0	47.0	53.0	59.0	58.3	64.3
Tamil Nadu	16.5	17.3	19.5	24.3	26.2	34.2	36.0	48.7	52.0	52.4	64.1
Uttar Pradesh	18.8	19.0	19.9	25.6	28.8	32.9	36.8	47.6	49.0	49.8	50.4
West Bengal	17.5	19.0	19.0	25.0	26.3	28.1	37.3	42.5	44.7	45.5	46.7
India (average)	17.6	18.5	20.0	25.0	27.1	32.3	37.9	46.8	49.8	50.1	56.4

n/a: not available.

Source: authors' estimates using data from the Consumer Price Index for Industrial Workers.¹²

Annex Table 4. Net state domestic product per capita (₹ 1000)

State/union territory	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018
Andhra Pradesh	39.8	44.4	50.5	58.7	69.0	74.7	82.9	93.7	108.2	122.4	140.6
Assam	21.3	24.1	28.4	33.1	41.1	44.6	49.7	52.9	60.8	67.3	74.7 ^a
Bihar	11.1	13.7	15.5	19.1	21.7	24.5	26.9	28.7	30.2	34.4	38.9
Chandigarh	103.0	108.5	117.4	126.7	159.1	178.5	199.1	206.8	222.7	237.6	256.3 ^a
Chhattisgarh	29.4	34.4	34.4	41.2	55.2	60.8	69.9	72.9	76.0	84.3	92.0
Delhi	95.2	111.8	125.9	145.1	185.4	206.6	229.6	249.6	271.3	300.8	329.1
Goa	108.7	136.0	149.2	168.0	259.4	234.4	215.8	289.2	334.6	375.6	420.4 ^a
Gujarat	50.0	55.1	64.1	77.5	87.5	102.8	113.1	127.0	139.3	156.5	173.6 ^a
Haryana	56.9	67.4	82.0	93.9	106.1	121.3	138.3	148.5	162.0	180.2	200.1 ^a
Himachal Pradesh	44.0	49.9	58.4	68.3	87.7	99.7	114.1	123.3	135.5	150.3	160.7
Jammu and Kashmir	27.4	30.2	33.7	40.1	53.2	56.8	61.1	61.2	73.2	78.2	86.0 ^a
Jharkhand	24.8	25.0	28.2	34.7	41.3	47.4	50.0	57.3	52.8	59.8	63.8
Karnataka	42.4	48.1	51.4	62.3	90.3	102.3	118.8	129.8	142.3	157.4	174.6
Kerala	46.9	54.6	62.1	69.9	97.9	110.3	123.4	135.5	148.0	163.5	183.2 ^a
Madhya Pradesh	20.9	25.3	28.7	32.5	38.6	44.9	52.1	56.1	62.8	74.6	81.3
Maharashtra	57.8	62.2	69.8	84.9	99.6	112.0	125.0	132.6	147.6	165.5	180.6
Odisha	27.7	31.4	33.0	39.5	48.4	54.7	60.6	63.2	65.7	74.2	81.0
Puducherry	74.2	79.3	96.9	101.1	119.6	130.5	148.1	146.9	172.9	185.1	198.2
Punjab	49.4	55.3	61.8	69.6	85.6	94.3	103.8	109.0	118.9	128.9	140.9
Rajasthan	26.9	31.3	35.3	44.6	57.2	63.7	69.5	76.4	84.0	92.1	100.6
Tamil Nadu	47.6	54.1	64.3	78.5	93.0	104.9	116.2	128.4	140.4	150.0	166.9
Uttar Pradesh	17.8	20.4	23.7	26.7	32.0	35.8	40.1	42.3	47.1	51.0	55.3
West Bengal	31.6	35.5	41.0	47.2	51.5	58.2	65.9	68.9	76.0	83.1	95.6
India (average)	33.9	38.4	43.6	51.6	62.5	70.3	78.5	85.0	93.5	103.8	114.9

^aMissing values for 2017/2018 replaced by authors' calculations using historical values at state level.

Source: Directorates of Economics and Statistics of the state governments, and the Reserve Bank of India.¹¹