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How good is compliance with smoke-free legislation in India? Results of 38 subnational surveys

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Received 23 December 2013; revised 26 April 2014; accepted 7 May 2014

Background: India has been implementing smoke-free legislation since 2008 prohibiting smoking in public places. This study aimed to assess the level of compliance with smoke-free legislation (defined as the presence of no-smoking signage and the absence of active smoking, smoking aids, cigarette butts/bidi ends and smoking smell) and the role of enforcement systems in Indian jurisdictions.

Methods: This was a cross-sectional, retrospective review of reports and primary data sheets of surveys conducted in 38 selected jurisdictions across India in 2012–2013.

Results: Of 20 455 public places (in 38 jurisdictions), 10 377 (51%) demonstrated full compliance with smoke-free law. Educational institutions and healthcare facilities performed well at 65% and 62%, respectively, while eateries and frequently visited other public places (such as bus stands, railway stations, shopping malls, stadia, cinema halls etc.) performed poorly at 37% and 27%, respectively. Absence of no-smoking signage was the largest contributor to non-compliance across all types of public places. Enforcement systems were present in all jurisdictions, but no associations could be demonstrated between these and smoke-free compliance.

Conclusion: Smoke-free compliance in public places in India was suboptimal and was mainly related to the absence of no-smoking signage. This warrants further pragmatic and innovative ways to improve the situation.

Keywords: Challans, Enforcement systems, India, Operational research, Smoke-free legislation

Introduction

Tobacco use is the single most preventable cause of premature adult death. Globally, there are more than one billion smokers¹ who can potentially expose others to second-hand smoke (SHS). Exposure to SHS has been proven to be as harmful as active smoking and is responsible for a wide spectrum of morbidity and more than 600 000 premature deaths worldwide.² India is home to 275 million tobacco users, which include 111.2 million smokers.³ Exposure to SHS is a serious but relatively ignored public health concern; an estimated 29% of adults aged ≥ 15 years are exposed to SHS in public places in India.³

Section 4 of India's national legislation for tobacco control, 'The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003' (COTPA), and subsequent rules 'Prohibition of Smoking in Public Places Rules, 2008' prohibit smoking in public places.^{4,5} However, in India, mere enactment of legislation

is not enough to stop smoking in public places. Legislation requires an effective enforcement system to ensure compliance. Periodic measurement of compliance with smoke-free legislation is important, with the results guiding implementers and policy-makers as to whether legal provisions are being followed and whether mid-course corrective actions are needed.

Previous publications on compliance with smoke-free legislation were limited as they included relatively small numbers and covered specific regions of the country and as such were not nationally representative.^{6–8} Furthermore, these previous surveys did not measure any association between enforcement of smoke-free law and compliance. From 2012, smoke-free compliance surveys have been conducted throughout the country to obtain a better picture of what is happening on the ground. The aim of the current study was to report on the level of compliance with smoke-free legislation and to assess the role of enforcement systems across 38 selected jurisdictions in India.

Methods

Study design

This was a cross-sectional, retrospective record review of reports and primary data sheets of the surveys conducted in 38 jurisdictions in India.

Setting

General

India is a country in Southeast Asia. It is the seventh largest by area and the second most populous country in the world, with over 1.2 billion people of whom 74% live in rural areas. India is a union comprised of 28 states and 7 union territories. Each state or union territory is further divided into administrative districts, which for the purpose of this study were defined as jurisdictions. Within the districts there are urban areas comprising cities and towns usually under the control of municipal bodies. There are also rural areas comprising blocks, tehsils and panchayats managed by Panchayati Raj Institutions, which are the administrative departments in charge of rural areas.

Tobacco control and surveys

India is among the few countries in the world having a dedicated vertical national programme for tobacco control, namely the National Tobacco Control Programme (NTCP). One of the major activities of the NTCP is implementation of the COTPA.⁹ State and district tobacco control cells are responsible government bodies for effective implementation of COTPA in their jurisdictions. Prohibition of smoking in public places rules under COTPA were enacted on 2 October 2008. Since then, various jurisdictions across the country have initiated tobacco control measures. To assess the progress of COTPA implementation, compliance surveys were conducted across 38 jurisdictions in India from January 2012 to April 2013 by local credible research institutions in collaboration with state and district tobacco control cells and the International Union Against Tuberculosis and Lung Disease (The Union), South-East Asia Regional Office (New Delhi, India). Field investigators who administered the questionnaire were all trained by the officers in charge of the surveys in each jurisdiction, who in turn were trained directly or indirectly by The Union South-East Asia Office. The population in a jurisdiction varied from 35 000 (Lahaul-Spiti) to 5.7 million (Patna), and the jurisdiction's geographical size varied from 111 km² (Jaipur City) to 22 901 km² (Jodhpur District). These jurisdictions were selected because this is where The Union has been providing technical support for tobacco control in India.

Compliance surveys

Public places in each jurisdiction are defined legally under COTPA⁵ and include accommodation facilities, eateries, educational institutions, offices, healthcare facilities, frequently visited other public places and public transport vehicles (see [Box 1](#)). Public places in each jurisdiction were selected on the basis of cluster sampling and proportionate-to-population size estimates as previously described,^{8,9} and the sample size varied from 67 to 1384 public places in different jurisdictions. Compliance is defined as the

degree to which a law is being obeyed.⁹ Observations of compliance with smoke-free legislation in each public place took place during peak business hours over 15–45 min using a structured checklist consisting of five indicators, including: 1. presence of no-smoking signage, meaning any pictorial, graphical or textual message displayed in a public place warning that smoking is prohibited in that place; 2. absence of active smoking, defined as no-one seen smoking at the time of the observation; 3. absence of smoking aids such as ashtrays, matchbox or lighters; 4. absence of cigarette butts or bidi ends; and 5. absence of smoking smell.⁵ For a public place to be fully compliant with smoke-free legislation, all five indicators have to be met.

Enforcement systems

Within each jurisdiction there are various enforcement systems to ensure compliance with smoke-free legislation. The foremost component is the establishment of a tobacco control cell in each state and district consisting of two to three officials whose work involves various tobacco control activities, which include training, law implementation, monitoring and evaluation and reporting.¹⁰ These officials enforce the provision of smoke-free law by a system of challan (defined as imposing fines for violating COTPA provisions). The central legislation has further notified (designated) 21 categories of officials and empowered them to take action if smoke-free legislation is violated.^{5,11} These officials can act individually, or as a team as a flying or enforcement squad.⁴

Study population

The study population included the sampled public places as defined under the Indian legislation within each of the 38 selected jurisdictions that were included in the surveys.

Data variables, source of data and data collection instruments

Data variables were collected in relation to study objectives. For the smoke-free compliance surveys, these included: month/year of survey; types of jurisdiction; number and category of public places; and in each public place, whether the five smoke-free indicators had been observed to take place. Sources of data were the survey reports and primary data sheets of the 38 jurisdictions (Supplementary data). For the smoke-free enforcement systems, these included: within each jurisdiction, whether there was a system for enforcing tobacco control that included a tobacco control cell, review meetings, nodal officers in place, notification of authorised officers for Section 4, notification of flying or enforcement squads, availability of challan and receipt books, and number of challans imposed from 2008 up until the time of the compliance survey. In each jurisdiction, the information was captured into a paper-based questionnaire (Supplementary data).

Analysis and statistics

Data were double-entered, validated and analysed using EpiData (v.3.1 for entry and v.2.2.182 for analysis; EpiData Association, Odense, Denmark). A descriptive analysis was conducted, and comparisons were also made between different public places

Box 1. Description of the designated public places used for assessing smoke-free compliance and the specific areas where the assessments were carried out

Category of public place	Types of facility within each public place	Specific areas within the public places for assessing smoke-free compliance ^a
Accommodation facility	Any lodging service paid for on a short-term basis, including hotels, motels, rest houses, resorts, guest houses, circuit houses, lodges, stand-alone hostels and stand-alone dormitories	Reception, lounge, at least two rooms on different floors, lobby areas, one toilet, at least one backside corridor (if any), bar (if any), restaurant (if any), poolside area (if any) ^a
Eatery	Any public place where people visit to eat, including stand-alone restaurants, beer bars and canteens, roadside eating places, sweets shops, tea stalls, cafeterias, taverns and pubs	The entire facility including the toilets
Educational institution	Any place or centre including schools, colleges and institutions of higher learning established or recognised by an appropriate authority where education instructions are imparted according to specific standards	At least two classrooms, the teachers' common room, one office room, the students' common room, one toilet, one canteen (if any) and hostel (if any) ^a
Office	Any room, a set of rooms or a building used as a place for commercial, professional or bureaucratic work. For example, a bank, post office, fire brigade station, complaint room of any public department, the office of a district education officer or chief medical officer or municipal councillor	Reception, common waiting room, at least two office rooms, employee retiring or common room (if any), one toilet, meeting room, lobby (if any), at least one backside corridor or balcony (if any), canteen (if any) ^a
Healthcare facility	Any building where medical services are provided to the public, including health subcentres, primary health centres, district hospitals, stand-alone clinics, laboratories and tertiary care hospitals	Reception, at least one male and one female ward (where applicable), one office room, one doctor's duty room, one toilet, one patients' waiting area, canteen (if any) ^a
Frequently visited other public place	Includes cinema halls, multiplex cinemas, petrol pumps, shopping malls, markets, public parks, temples, mosques, stadia, playgrounds, amusement parks, bus stands, taxi stands and railway stations. These are places where the public has easy access but that are poorly monitored by owners or people in charge	Main entrance area, central core area, at least two public toilets, information area and waiting area (where applicable) ^a
Public transport vehicle	Includes buses, taxis, auto rickshaws and maxi cabs	The entire vehicle

^a All of these areas (if applicable) needed to be assessed for smoke-free compliance in the facility.

with respect to overall smoke-free compliance using ORs and 95% CIs. With regard to enforcement systems, jurisdictions were categorised into four groups according to the number of challans per 100 public places (0–50, 51–100, 101–500 and ≥ 501). Median smoke-free compliance was calculated for each of the four jurisdiction groups and was compared for statistical significance using the Kruskal–Wallis test, a non-parametric alternative to ANOVA. Levels of significance were set at 5%.

Results

In total, 20 757 public places were visited in the 38 jurisdictions to assess compliance with smoke-free legislation. The questionnaires were incomplete with some questions unanswered in 302 places, leaving 20 455 public places (99%) for which there was complete information.

Smoke-free compliance

The number and type of public places showing compliance with specific indicators of smoke-free legislation are shown in Table 1. In 89–92% of all facilities there was no evidence of active smoking, smoking aids or smoking smell. In nearly three-quarters of facilities, no cigarette butts or bidi ends were found. In two-thirds of all facilities, one or more no-smoking signages were present.

In the fixed facility structures such accommodation facilities, eateries, educational institutions, healthcare facilities and offices, there was a general similarity in results. No-smoking signage was present in approximately 60–70% of these facilities and there was no observed smoking, no smoking smells and no smoking aids in approximately 80–95%, while absence of cigarette butts/bidi ends varied from approximately 50 to 90%. In the frequently visited other public places and public transport

Table 1. Number and type of public places in 38 jurisdictions in India showing compliance with specific indicators of smoke-free legislation (2012–2013)

Type of public place	Total no. ^a	No. (%) of public places showing compliance with specific indicators of smoke-free legislation				
		Presence of no-smoking signage	Absence of active smoking	Absence of smoking aids	Absence of cigarette butts/bidi ends	Absence of smoking smell
Accommodation facilities	1394	988 (71)	1267 (91)	1098 (79)	935 (67)	1217 (87)
Eateries	3034	1884 (62)	2511 (83)	2499 (82)	1578 (52)	2263 (75)
Educational institutions	4222	3061 (73)	4127 (98)	4073 (96)	3824 (91)	4118 (97)
Offices	5538	3966 (72)	5270 (95)	5288 (95)	4193 (76)	5134 (93)
Healthcare facilities	2715	1980 (73)	2621 (96)	2627 (97)	2343 (86)	2614 (96)
Frequently visited other public places	2304	1120 (49)	1843 (80)	2006 (87)	1209 (52)	1752 (76)
Public transport vehicles	1248	790 (63)	1106 (89)	1141 (91)	927 (74)	1062 (85)
Total	20 455	13 789 (67)	18 745 (92)	18 732 (92)	15 009 (73)	18 160 (89)

^a This includes the public places in which the questionnaire was fully completed with all questions answered. There were 302 public places excluded from this analysis because questionnaires were incomplete.

Table 2. Number and type of public places in 38 jurisdictions in India showing full compliance with all five indicators of smoke-free legislation (2012–2013)

Type of public place	Total no. ^a	No. (%) with full compliance ^b	OR (95% CI)
Accommodation facilities	1394	637 (46)	2.26 (1.96–2.59)
Eateries	3034	1122 (37)	1.57 (1.40–1.77)
Educational institutions	4222	2745 (65)	4.98 (4.46–5.57)
Offices	5538	2982 (54)	3.13 (2.81–3.48)
Healthcare facilities	2715	1678 (62)	4.34 (3.85–4.89)
Frequently visited other public places	2304	626 (27)	Referent
Public transport vehicles	1248	587 (47)	2.38 (2.06–2.75)
Total	20 455	10 377 (51)	

^a This includes the public places in which the questionnaire was fully completed with all questions answered. There were 302 public places excluded from this analysis because questionnaires were incomplete.

^b Full compliance means compliant with all of the five indicators of smoke-free legislation.

vehicles, compliance was generally less good, particularly with respect to no-smoking signage.

The number and type of public places showing full compliance with all five indicators of smoke-free legislation is shown in Table 2. Just over 50% of public places (10 377/20 455) showed full compliance with smoke-free legislation, with educational institutions (2745/4222) and healthcare facilities (1678/2715) performing well at >60% showing full compliance, and frequently visited other public places performing worst with just over 25% (624/2304) showing full compliance.

Enforcement

The enforcement systems were assessed in all 38 jurisdictions. In all jurisdictions, there was establishment of a tobacco control cell

that held regular review meetings, there were orientation and capacity building workshops, and notification of a nodal officer and authorised officers for Section 4. Of the 38 jurisdictions, 33 (87%) had notification of flying squads and 37 (97%) had challan and receipt books available. The number of challans per 100 public places varied from 0 to 2234, with a median of 74. Overall compliance in the four jurisdictions in relation to the number of challans per 100 public places is shown in Table 3. There were no statistically significant differences in overall compliance between the different jurisdictions.

Discussion

This is probably the largest observational study to assess compliance with smoke-free legislation in public places ever conducted

Table 3. Association between jurisdictions classified by the number of challans and the level of overall compliance with smoke-free legislation in India (2012–2013)

No. of challans per 100 public places	No. of jurisdictions	Median (range) of overall compliance ^a
0–50	15	65 (7–85)
51–100	5	40 (23–63)
101–500	12	47 (14–67)
≥501	6	50 (15–85)

^a Kruskal–Wallis test ($p=0.57$).

in the world, with over 20 000 public places visited and evaluated. In all 38 jurisdictions in India, a high level of smoke-free compliance was observed as judged by no evidence of active smoking, smoking aids or smoking smell. However, cigarette butts and bidi ends were found in nearly one-quarter of public places, indicating that there was recent smoking in the facility, which was not seen by the observation team. Display of no-smoking signage is an important indicator of compliance with smoke-free legislation, showing that the owner of a facility abides by the law and is reminding non-smokers about their constitutional right to enjoy a non-smoking environment. No-smoking signage display was only observed in two-thirds of all facilities, and this component of smoke-free compliance showed the lowest uptake in public places. The reasons for this are not clear but may include lack of awareness or knowledge about the law amongst owners and persons in charge of public places, problems with getting signage made and securing them within the facilities and, finally, lack of enforcement of smoke-free legislation.

Overall, about one-half of public places showed good compliance with all five indicators of smoke-free legislation. It was not surprising to see that educational and healthcare facilities performed best when it came to overall compliance with all five indicators, and similar good results have been found in educational institutions in previous studies both in India and other countries.^{7,8,12} Persons in charge of these healthcare and educational facilities are more likely to know about the law and the harmful effects of SHS, and in healthcare facilities especially, personnel are constantly reminded about the dangers and risk of tobacco use through their daily work with patients. However, in both of these facilities one-third failed to meet all five criteria of smoke-free compliance, largely because no-smoking signage was absent in the designated areas.

The worst performing facilities were eateries and frequently visited other public places, which included a wide variety of sites such as cinema halls, petrol pumps, shopping malls, markets, stadia, bus stands, railway stations, amusement parks and so on. This finding was similar to previously reported studies in India.^{7,8} A large proportion of eateries and frequently visited other places had no-smoking signage and similarly had evidence of cigarette butts and bidi ends. These places are heterogeneous but are characterised by large influxes of people at different times of day and laxity in monitoring of smoke-free policy.

The strengths of this study are the large number of public places evaluated across the country and the same questionnaire administered in all jurisdictions (although there were minor amendments related to language) by trained field investigators.

The surveys done previously in India have shown variable compliance with smoke-free legislation, but as discussed earlier were limited by small numbers and limited geographical foci.^{6–8} In other countries, various surveys have also been carried out on smoke-free compliance showing generally good results.^{12–20} However, these were usually focused on specific types of facility within a jurisdiction rather than all public places, and the surveys used a different methodology to that used in the current study. For this reason, a comparison of results with this large Indian study is not appropriate.

We need to find ways to improve smoke-free compliance in public places. First, there should be stronger education and advocacy efforts directed at the general public about smoke-free legislation as this has been shown to increase compliance.²¹ Second, it is important to demonstrate the government's commitment to smoke-free legislation soon after smoke-free laws are enacted. This could be done by unannounced inspections and surprise checks of facilities by authorised officers. Once a high level of compliance is achieved, it may be possible to decrease formal enforcement measures and enhance empowering communities to self-regulate themselves.²² Third, one-off surveys as described in this paper are not sufficient in their own right to help improve smoke-free compliance. There needs to be a better system of education, supervision, monitoring and evaluation, supplemented by periodic surveys, and co-ordinated by the NTCP at the state and district level. At some stage, formal evaluations of the impact of smoke-free environments would be essential to persuade policy-makers of the necessity of this approach for good public health practice.

Limitations of the study

According to the criteria used in this study, all jurisdictions complied with several components of smoke-free enforcement systems such as tobacco control cells, regular review meetings, nodal officers and authorised officers for Section 4. In addition, most jurisdictions had flying squads and the availability of challan and receipt books. The number of challans imposed per 100 public places varied from jurisdiction to jurisdiction, but no association was found between the number of challans imposed and overall levels of smoke-free compliance. This was initially a surprising finding as we expected to see better compliance as a result of more enforcement through the system of challans. There are various reasons for this discrepancy. First, this was a cross-sectional study and hence it is not possible to establish the temporality of the association. Furthermore, we have no data on trends in challans over time. For example, in a jurisdiction, challans may have been high initially due to poor smoke-free compliance and then decreased over time as compliance improved. This is a limitation of this particular aspect of the study. Second, with only 38 jurisdictions, we were not powered to demonstrate the association between enforcement and compliance with smoke-free law. Third, the punishment for violating a smoke-free law is less than US\$4, which may be an insufficient deterrent for owners of public places, particularly eateries, who may fear that they will lose business if they forbid the use of tobacco.²³

Conclusion

This large study in India in more than 20 000 public places showed that just over 50% showed compliance with all five indicators of smoke-free legislation. Compliance was better for educational and healthcare facilities, while eateries and frequently visited other public places showed the worst results. In this study there was no association between compliance and enforcement, and other pragmatic and innovative ways to improve smoke-free compliance are needed.

Supplementary data

Supplementary data are available at International Health Online (<http://inthehealth.oxfordjournals.org/>).

Authors' disclaimer: The funding bodies had no role in study design, data collection and analysis, the decision to publish, or preparation of the manuscript.

Authors' contributions: RK, SG, PL and ADH conceptualised, designed and facilitated the study; RK, PL and RJS collected, analysed and interpreted the data; RK, ADH and AMVK prepared the first drafts of the manuscript; PL, RJS, ADH, AMVK, SG and NCW critically reviewed the drafts and assisted in the preparation of the final manuscript. All authors read and approved the final manuscript. RK is the guarantor of the paper.

Acknowledgements: This research was supported through an operational research course, which was jointly developed and run by the International Union Against Tuberculosis and Lung Disease (The Union), South-East Asia Regional Office (New Delhi, India), the Centre for Operational Research, International Union Against Tuberculosis and Lung Disease (Paris, France) and the Operational Research Unit (LUXOR), Médecins Sans Frontières, Brussels Operational Center (Luxembourg). This course is under the umbrella of the World Health Organization (WHO-TDR) SORT-IT programme (Structured Operational Research and Training Initiative) for capacity building in low- and middle-income countries. The authors gratefully acknowledge the Bloomberg Initiative to Reduce Tobacco Use and research partners in respective jurisdictions.

Funding: Funding for the course was obtained from the Bloomberg Philanthropies and the Department for International Development, UK.

Competing interests: None declared.

Ethical approval: Permission to conduct the compliance surveys was granted through local authorities, and the surveys were part of tobacco control activities at the International Union Against Tuberculosis and Lung Disease (The Union), South-East Asia Regional Office (New Delhi, India). Ethical approval for the study was obtained from The Union Ethics Advisory Group (Paris, France).

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