Refining compliance surveys to measure the smokefree status of jurisdictions using the Delphi method

S. Goel,¹ R. Kumar,² P. Lal,² D. Sharma,¹ R. J. Singh²

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Setting: Compliance assessment surveys are cost-effective means of assessing smokefree status in a jurisdiction. Assigning weights to assessment criteria (indicators) can also inform law implementers and policy makers about the effectiveness of the enforcement of smokefree rules.

Objective: To develop a standardised measure for compliance surveys using the Delphi method in India.

Design: Tobacco control experts from India comprising different constituencies and jurisdictions met for a half-day workshop in August 2012 to deliberate on how weights can be assigned to criteria for smokefree status. Using the Delphi method, the relevance and ranking of criteria from an existing protocol for measuring compliance was evaluated.

Results: Consensus was reached on all five compliance survey indicators through three rigorous rounds of discussion. The highest priority was assigned to the absence of the act of smoking in public places (33%), followed by the display of no-smoking signage in public places (32%), absence of cigarette butts or *bidi* stubs (15%), absence of smoking aids (10%) and absence of tobacco smoke and ash (10%).

Conclusion: Tobacco control advocates can effectively inform local policy makers using weights that prioritise directed enforcement and targeted interventions, which in turn will ensure stronger compliance and sustainable smokefree settings.

Tobacco is the single largest cause of preventable deaths among adults, both globally and in India. It is estimated that more than one million premature deaths among adults occur in India every year.¹ More than one third of adults use tobacco in some form or the other in India. Exposure to second-hand smoke (SHS) is a serious but relatively ignored public health concern—an estimated 29% of adults are exposed in public places.² SHS exposure causes disease and premature death in children and adults who do not smoke. Scientific evidence indicates that there is no risk-free level of exposure to SHS.³ Exposure to SHS has an immediate adverse impact on the cardiovascular system, damaging blood vessels, and increasing the risk of blood clot, heart attack and stroke.⁴ Passive smoking is also associated with a significantly increased risk of type 2 diabetes mellitus.⁵ Every year, SHS exposure causes over 600 000 premature deaths worldwide.⁶

India's 2003 Cigarettes and Other Tobacco Products Act, which came into force in October 2008, effectively bans smoking in public places.^{7,8} National legislation prescribes three legal provisions with which

every public place must comply: 1) the display of 'no smoking' signage, 2) absence of active smoking and 3) non-availability of smoking accessories and aids such as ashtrays, matchboxes and lighters. Furthermore, to measure compliance with the law in spirit, two proxy indicators are also adopted in compliance surveys: absence of tobacco litter, such as cigarette butts or *bidi* stubs, and absence of the smell of smoking.

The challenge in India, as in much of the developing world, is that of enforcement and implementation of legal provisions. As jurisdictions began enforcing the legal provisions that protect non-smokers from SHS, the need was felt for the development of an effective tool to measure compliance with the law in these jurisdictions. The International Union Against Tuberculosis and Lung Disease South-East Asia Office in New Delhi conducted the first series of surveys in India in 2009 to measure the compliance of jurisdictions,⁹ and similar surveys were subsequently conducted in other jurisdictions in India.^{10,11}

Globally, such surveys have been found to be effective tools for measuring the level of compliance with implementation of legal provisions prescribing a public place and a jurisdiction as a whole to be declared smokefree. Compliance surveys are also effective tools for informing policy makers and enforcers about progress made and about current gaps in overall compliance within jurisdictions.

An early attempt to define a standard set of criteria to assess the level of compliance was made at the 2009 Union Second National Workshop on Smokefree India. Various surveys carried out across different jurisdictions in India have used these criteria, and the guide book 'Assessing compliance with smoke-free laws: a "how to" guide for conducting compliance studies' was released by the Bloomberg partners in April 2011.¹² The tool contains 10 criteria related to measuring compliance; however, weighting of individual items in terms of their importance to smokefree status of the location was lacking. This makes it difficult to calculate overall compliance scores with respect to a public place by type (e.g., educational institutions) or to a jurisdiction as a whole.

It is important for decision makers to adopt robust processes for setting priorities so that limited resources are allocated efficiently, effectively and transparently in the enforcement of smokefree laws. When multiple criteria exist, decision making becomes more difficult. Prioritising criteria by using weights can be used to assist decision makers. A standardised tool will be helpful for reporting overall compliance and also to compare these across jurisdictions and type of public place.

AFFILIATIONS

1 School of Public Health, Postgraduate Institute of Medical Education and Research, Chandigarh, India

2 International Union Against Tuberculosis and Lung Disease South-East Asia Regional Office, New Delhi, India

CORRESPONDENCE

Sonu Goel
School of Public Health
PGIMER, Sector 12
Chandigarh 160012, India
Tel: (+91) 172 275 5215
e-mail: sonugoel007@yahoo.co.in

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The present study uses the Delphi method to refine the existing protocol and make it concise, feasible and time saving.

The Delphi technique was developed in the 1950s and has been used extensively in management science to improve decision making by removing individual bias and prioritising the task at hand.^{13,14} Its key characteristics are anonymity, use of expert advice and controlled feedback, which are useful in eliciting structured responses within competing priorities and as an aid to policy making, where arriving at a consensus is complex and difficult. Simply put, the Delphi technique is a practical approach to achieving agreement among a diverse group of experts with widely diverging views where none exists on a certain issue. It is based on the assumption that group opinion has greater validity than individual opinion. To gain consensus among a panel of experts, they are asked to rank or rate items on a defined set of items on a checklist. A consensus level is set (e.g., 70%), and once this is arrived at, consensus is said to have been reached.^{15–17} Prioritising criteria were decided by a group of tobacco control experts to address the need for a simple tool with a wider policy benefit.

METHODOLOGY

Design

The Delphi technique using three rounds of reiterative questionnaires was used in the study to obtain consensus.

Participants

A workshop was organised on 9 August 2012 at Shimla in Himachal Pradesh, India, to gain consensus among experts regarding the ranking and weightage of compliance assessment indicators in the provisions of existing tobacco control legislation in India and other proxy indicators that are adopted during compliance assessment surveys. A total of 16 experts or participants from various settings, such as government agencies ($n = 3$), non-government organisations ($n = 5$), academia ($n = 4$) and international organisations ($n = 4$) working in the field of tobacco research, with a fair representation from across jurisdictions and regions of India, participated in the workshop.

Setting

Three rounds of discussions were conducted by the principal researcher (SG), followed by two interactive rounds of discussion for consensus building among the groups; a third round with individual voting through a show of hands was done before consensus was arrived at. A reiterative, open-ended discussion was facilitated by the moderator, where existing local and global evidence was given precedence.

Procedure

The discussion was initiated by the principal researcher. Brief information about the topic (smokefree public places) and the exercise was given to the participants. Verbal consent was obtained from the participants and it was ensured that participants had no conflict of interest, particularly with respect to any relationship with the tobacco industry, etc. Participants were also apprised of the methodology and application of the Delphi technique. The compliance criteria to be included in the discussion were taken from the globally accepted protocol developed by Bloomberg partners,¹² provisions of existing tobacco control legislation in India and other compliance assessment surveys. The strength of the Delphi technique was sharing of information and reasoning among a group of experts. Experts were asked to review and

revise their positions in the light of comments made by their peers. The final formulation of judgment was acceptable to all the participants.

RESULTS

Round 1

The objective of the first round of discussions was to generate ideas and identify a prioritised list of compliance assessment indicators vital for conducting smokefree surveys at jurisdiction level. Participants were randomly divided into four groups. The groups were then asked to discuss the following among themselves: 'among the existing criteria, which do you consider crucial for declaring a jurisdiction smoke free?' Each group was given 20 min to deliberate, and a rapporteur from within the group noted each participant's allocation of weightages. In response, each group deliberated among themselves and generated a consensus first among themselves and then with other groups. At this stage, the group reached the consensus that five out of 10 indicators should be kept for further prioritisation and ranking (Table 1). Arguments made by the various groups were as follows: 'we feel that just placing signage in a public place is a good measure of compliance rather than additional indicators like signage at entrance or exit or signage with name of reporting officer, etc.'; 'smoking at entrance or exit will not have an additional yield in measurement of compliance over smoking in public places'. Following this round, the next phase of discussion was initiated.

Round 2

The objective of this round was to review and rank the five items in the list generated in the first round of discussion. Experts were requested to rate the importance of each selected item and to assign weightage to each of these using a scale of 0 to 100 (with 100 being highest priority and 0 if they still believed that an item should not be included in the checklist) after discussion in their groups. The groups were asked to provide reasons to justify their ranking. At the end of this round, criteria were listed in descending order of priority by each group (Table 2).

After a series of discussions, all four groups assigned similar scores to three items, i.e., 15 points for cigarette butts or *bidi* stubs in public places and 10 points each for evidence of recent smoking and smoking aids in public places. Despite having similar feelings among groups that 'absence of active smoking' and 'presence

TABLE 1 Compliance assessment indicators shortlisted by the groups after the first round of discussions

Compliance assessment indicators	Group decision (✓/x)
No active smoking noticed in public places	✓
Signage displayed in public places	✓
No cigarettes butts/ <i>bidi</i> stubs in public places	✓
No evidence of recent smoking (as evident from the lack of smell)	✓
No smoking at entrance/exit	x
Signage displayed at main entrance and conspicuous places	x
Signage complies with the law	x
Details (name and phone no) of reporting officer indicated	x
No smoking aids (e.g., ashtrays, matchbox, lighters) in public places	✓
No designated smoking room in hotel or restaurant	x

✓ = indicators retained for next round; x = indicators not considered for next round.

TABLE 2 Ranking (out of 100) of each compliance assessment indicator by each group after second round of discussions

Compliance assessment indicators	Group 1	Group 2	Group 3	Group decision
Signage displayed in public places	35	28	35	*
Absence of active smoking	35	27	30	*
Absence of smoking aids	10	16	15	10
Absence of cigarette butts/ <i>bidi</i> stubs	10	15	10	15
Absence of the smell of smoke	10	14	10	10

*No consensus could be reached.

of “no smoking” signage’ are two key compliance indicators, consensus on their ranking could not be reached. The arguments made were as follows: ‘the three indicators, i.e., absence of cigarette butts or *bidi* stubs, smoking aids and smell of smoke are proxy or indirect indicators of measuring compliance, so this should be given a low rating’, ‘absence of cigarette butts/*bidi* stubs should be given relatively more weightage among the three, as they depict smoking activity in recent past’. The groups needed to be dissolved for ranking of two items (active smoking seen and signage displayed).

Round 3

The objective of this round was to reach consensus on the ranking of two items (active smoking seen and signage displayed) and consolidate the discussions. A brief summary of justifications (especially on these two indicators) provided by participants for ranking indicators in the second round was circulated among the participants. The participants were individually asked to score these two indicators from among the remaining points (65 points) after reaching consensus in the previous round. The individual members made an informed decision regarding the ranking of the two indicators. The range in both indicators obtained was 20–45 for absence of active smoking in public places and 25–40 for presence of ‘no smoking’ signage. The discussions in favour of active smoking were as follows: ‘watching a person smoking in a public place is the most significant direct indicator of compliance’, ‘signage may be present in a public place and a person may be smoking just near it—do we still consider good compliance?’ The discussions in favour of signage were as follows: ‘you have to observe 24 hours a day to see somebody smoking in a public place and labelling a place as compliant with smokefree provisions, whereas signage is relatively permanent and you may observe at any point in time’, ‘presence of signage depicts the seriousness of the government about smokefree law’. This led to open discussion by each of the participants as regards prioritising and ranking the indicators, followed by voting by the participants. As a result, a mean score for the indicators was obtained (Table 3).

Once the mean score of two indicators had been obtained, a

TABLE 3 Ranking of two compliance assessment indicators (where no consensus was reached after second round) by individual voting

Measures of central tendency	Score of compliance assessment indicators	
	Absence of active smoking	Presence of ‘no smoking’ signage
Mean	33.125	32.875
Mode	30	30
Median	32.5	30
Range	15 (20–45)	15 (25–40)
Decision	33	32

conjoint consensus was sought once again from all of the participants to either agree with the rankings or re-rank their choices. At the end of this round, there was agreement on the rankings for each indicator, i.e., 33 for absence of active smoking and 32 for presence of ‘no smoking’ signage.

DISCUSSION

A large number of studies have used the Delphi technique in business, industry and health care research, with a variety of methodological interpretations and adaptations.^{18–22} However, this technique has not been used in tobacco control or specifically in smokefree compliance surveys. Compliance surveys for assessing smokefree status may be direct observational studies that are purely quantitative or semi-qualitative studies if subjective measures, such as the smell of tobacco, are introduced.

In this study, the Delphi panel of 16 experts clearly recognised the fact that all the compliance indicators of the study tool need not be included in the survey. The experts achieved a level of consensus on five compliance indicators. Some experts may question the validity of using only five indicators in assessing compliance with smoke free status. We feel that although exhaustive checklist surveys are a useful method of gathering information, they are not the only method. We need to decide whether a survey will produce the information we need. A five-point checklist may be time-saving, less burdensome for the data collector and more objective in nature.

This focus group discussion used a common management approach to determine the relative importance of the criteria. Results indicated that the ‘act of smoking’ and ‘presence of signage’ were the most important prioritisation criteria. The former was seen as actual implementation of the legal provision, as it assumed that the non-smoker’s demand for clean air was both an obligation and a right.

The limitations of the Delphi technique are its labour-intensive and time-consuming nature and the difficulty in arriving at a consensus among experts. Although it is time-consuming, the process generates ideas and supports experts in prioritising criteria. A possible limitation of the technique is the fact that single opinions that might be of special value are also pooled and normally ignored. To overcome this limitation, the principal researcher summarised the discussion from time to time, encouraged group members to do so as well and helped participants find a common ground without forcing a consensus. Illustrative tools such as flip charts were freely used during the discussion. This tool needs to be tested over time. As more smokefree jurisdictions emerge, greater manpower and resource-effectiveness will be needed, and with increased understanding and appreciation, this methodological should be revisited.

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Contexte : Les enquêtes d'évaluation de l'adhésion sont des moyens d'un bon rapport coût-efficacité pour l'évaluation du statut sans fumée dans une juridiction. La détermination du poids des critères d'évaluation (indicateurs) peut fournir des informations supplémentaires à ceux qui appliquent la loi et élaborent les politiques concernant l'efficacité de l'application des règlements d'interdiction de fumer.

Objectif : Elaborer, au moyen de la méthode Delphi, une mesure standardisée pour les enquêtes d'adhésion, en Inde.

Schéma : Les experts de lutte contre le tabac en Inde provenant de diverses circonscriptions et juridictions se sont rencontrés pour un atelier de travail d'une demi-journée en août 2012 afin de discuter sur l'attribution du poids des critères concernant les lieux sans fumée. Grâce à la méthode Delphi, on a étudié le caractère pertinent et l'importance relative des critères dans un protocole existant de mesures de l'adhésion.

Marco de referencia: Las encuestas de evaluación del cumplimiento constituyen medios rentables de apreciar la condición libre de humo en una jurisdicción. La ponderación de los criterios de evaluación (indicadores) puede además informar a quienes aplican la ley y a quienes planifican las políticas sobre la eficacia real del cumplimiento de las reglas relacionadas con los ambientes sin humo.

Objetivo: Definir una medida normalizada destinada a las encuestas de cumplimiento, con aplicación de los métodos Delphi en la India.

Métodos: Expertos sobre el control del tabaco en la India, de diferentes circunscripciones y jurisdicciones se reunieron en un taller durante medio día en agosto del 2012 con el fin de deliberar sobre la forma de ponderar los criterios de evaluación de los ambientes sin humo. Se definió la pertinencia y la importancia de los criterios de un protocolo existente, mediante el método Delphi.

Résultats : On est arrivé à un consensus sur l'ensemble des cinq indicateurs des enquêtes de conformité à la suite de trois tours rigoureux de discussion. La priorité la plus importante a été attribuée à l'absence de toute fumée dans les lieux publics (33%), suivie de la mise en place d'une signalisation « non-fumeurs » dans les lieux publics (32%), de l'absence de mégots de cigarettes ou de morceaux de *bidi* (15%), de l'absence d'aides au tabagisme (10%) et de l'absence de fumée de tabac et de cendres (10%).

Conclusion : Les défenseurs de la lutte contre le tabac peuvent informer les élaborateurs locaux de politique sur la façon efficace d'utiliser les poids qui donnent une priorité à l'application directe des règles et aux interventions ciblées, ce qui peut permettre une meilleure adhésion et la persistance d'environnements sans fumée.

Resultados: Se logró el consenso sobre los cinco indicadores de las encuestas de cumplimiento, tras tres rondas rigurosas de análisis. Se debe asignar la prioridad más alta a la ausencia del acto de fumar en los lugares públicos (33%), seguido por la fijación de carteles de señalización de no fumar en los lugares públicos (32%), la ausencia de colillas de cigarrillo o de *bidis* (15%), la ausencia de elementos accesorios del consumo de tabaco (10%) y la ausencia de humo de tabaco y ceniza (10%).

Conclusión: Los defensores del control del tabaco pueden informar a los planificadores locales de políticas de manera eficaz, al aplicar medidas de ponderación que dan prioridad a una exigencia de cumplimiento dirigida y a las intervenciones con fines concretos, lo cual puede facilitar un mayor cumplimiento de la ley y la obtención de ambientes sin humo sostenibles.