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Setting research priorities in tobacco control: a stakeholder engagement project

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ABSTRACT

Background and Aims The Cochrane Tobacco Addiction Group (TAG) conducts systematic reviews of the evidence for tobacco cessation and prevention interventions. In 2016 TAG conducted a priority-setting, stakeholder engagement project to identify where further research is needed in the areas of tobacco control and smoking cessation. **Design** The project comprised two surveys and a workshop. A range of stakeholders participated, including members of the public (smokers and ex-smokers), clinicians, researchers, research funders, health-care commissioners and public health organizations. The first survey phase identified unanswered research questions in the field of tobacco control. The second phase asked participants to rank these, with overall rankings calculated by combining scores across participants. The workshop allowed attendees to discuss prioritization of topics and questions in more depth. Workshop discussions were transcribed and analysed thematically, and a final voting activity at the close of the workshop allowed participants to choose topics to prioritize and to de-prioritize. **Findings** A total of 304 stakeholders (researchers, health professionals, smokers and ex-smokers, guideline developers, research funders and policymakers, representing 28 countries) identified 183 unanswered research questions. These were categorized into 15 research categories. A total of 175 participants prioritized categories and questions in the second survey phase, with 'electronic cigarettes'; 'addressing inequalities'; and 'mental health and other substance abuse' prioritized as the top three categories. Forty-three stakeholders attended the workshop and discussed reasons for and against category prioritization. Prioritized research categories largely mirrored those in the survey stage, although 'treatment delivery' also emerged as a key category. Five cross-cutting themes emerged: efficacy; relative efficacy; cost effectiveness; addressing inequalities; and different types of evidence. **Conclusions** There are many unanswered questions in the field of tobacco control. Stakeholders highlighted electronic cigarettes, addressing inequalities and mental health and other substance abuse as key areas for further research, and efficacy, relative efficacy, cost-effectiveness and use of non-randomized studies as important themes cutting across research areas. Future prioritization work would benefit from targeting non-US and non-UK stakeholders explicitly and from examining where priorities may differ based on stakeholder group.

Keywords Addiction, prioritization, public involvement, smoking, stakeholder, tobacco.

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INTRODUCTION

Cochrane is a large, not-for-profit, global organization dedicated to carrying out systematic reviews to gather and summarize the best evidence to inform health-care decisions. It is made up of a number of satellite groups dedicated to different health problems. The Cochrane Tobacco Addiction Group (TAG) was formed in 1996 in the Nuffield Department of Primary Care Health Sciences at the University of Oxford, and publishes reviews of interventions for smoking prevention and cessation to inform health-care policy, guidance and practice [1]. TAG have published more than 70 reviews which have contributed to national guidelines [such as those produced by the UK National Institute for Health and Care Excellence (NICE), and the US Department of Health and Human Services] and professional clinical training programmes [such as the UK-based National Centre for Smoking Cessation and Training (NCSCT)].

Cochrane TAG is dedicated to developing a programme of research and publications that responds most effectively

to world-wide public health needs and demands over the coming years. This includes feeding into the research agenda for primary studies, developing new protocols for systematic reviews, publishing new reviews, prioritizing the update of existing reviews and adapting these updates by responding to changes in methodology, the needs of the user and the uses of existing treatments.

Health research priority-setting is important, as it helps to effectively target research that will provide the greatest benefit to public health and maximizes the impact of financial investment [2]. The James Lind Alliance is an example of an organization which encourages patients and clinicians to work together to identify research priorities, on the basis that researchers and industry do not always identify and address research questions deemed most relevant to patients and clinicians, i.e. those most affected by the results [3]. To ensure that Cochrane TAG continues to produce research outputs that meet public health needs, the group conducted a health research priority-setting project as part of activities to mark its twentieth anniversary. The project, called Cochrane TAG's 20th anniversary priority-setting project (CTAG taps), was inspired by the approach of the James Lind Alliance, and centred on the involvement of Cochrane TAG's stakeholders.

METHODS

We planned our approach with guidance from the James Lind Alliance Guidebook [4]. However, we chose to expand stakeholder involvement beyond the public and clinicians (the groups involved in the James Lind approach) for this exercise. We used a power-interest matrix to identify other key stakeholders in tobacco control and Cochrane TAG based on their interest in our research outputs, and their position as influencers of public policy in this area. These included public health representatives, such as members of local authorities and Public Health England (PHE); as Cochrane also influence guidelines, we included representatives in this area, e.g. NICE. Furthermore, we still wanted to involve researchers in the exercise, as although this group are likely to have influenced Cochrane TAG's approach most during their initial 20 years, their input is still valued and has not been maximized.

Aim

For the purposes of this paper we explore the following aim of the project:

- To identify areas where further research is needed in the areas of tobacco control and smoking cessation, by involving Cochrane TAG's stakeholders

For a wider account of project aims, methods and results please see the full report of the CTAG taps project [5].

The project was a three-stage process, which consisted of two surveys and a workshop. For all stages Cochrane TAG's stakeholders were deemed to be made up of anyone with any interest in the area of tobacco and smoking, with key examples being: smokers and former smokers, carers of people with smoking-related illness, policymakers, health-care guideline developers, health-care providers, researchers (policy- and clinically based), research funders, health-care commissioners and public health campaigners and charities.

Phase 1 survey—identifying uncertainties

We developed the first survey based on the James Lind Alliance process [4]. The survey asked participants for between one and four questions they would still like to see answered by tobacco control research. Participants were also asked to supply a small amount of information about themselves (age, gender, type of stakeholder, country of residence). Names and e-mail addresses were collected so that participants could be contacted for the second wave of the survey. During development, the survey was adjusted in response to feedback from the 'UKCTAS smokers' panel', which is a Patient and Public Involvement Group, made up of current and former smokers, managed by the UK Centre for Tobacco and Alcohol Studies (UKCTAS). The survey was built using open-access, web-based, online survey building software (www.surveymonkey.com). It contained a brief description of the project, a mix of closed and open questions regarding participant demographics and four open-text questions in which participants were asked to identify unanswered questions and, if they wished, provide further text justifying the importance of the question.

The survey was disseminated via a web-link between mid-February and mid-March 2016, targeting TAG's stakeholders internationally. This involved e-mailing Cochrane TAG's mailing list, as well as asking other key stakeholder organizations such as Action on Smoking and Health (ASH), the US Food and Drug Administration (FDA) and PHE to circulate among their members and/or send out to their mailing lists. We also shared the web-link on social media via the Cochrane TAG Twitter account (@CochraneTAG) and a Facebook advertisement, promoted it at the Society for Research on Nicotine and Tobacco (SRNT) annual international conference (Chicago, USA), and wrote blog posts promoting the group and highlighting the survey. We conducted web research to identify key organizations and stakeholders both nationally and internationally and contacted these groups via social media and/or e-mail where possible.

When the survey closed, all responses were collated and processed in three steps:

1. Three authors (J.H.B., L.H., N.L., at least two for each question) screened submitted questions to remove duplicates and rephrase to improve readability where

necessary. Where there was indecision or disagreements, agreement was reached through discussion with the third person.

2. Five authors (J.H.B., L.H., L.S., N.L., P.A.) classified each de-duplicated question as either 'unanswered' by research to date; already 'answered' by research; or 'non-empirical', i.e. could not be answered through scientific enquiry. Each question was assessed by two people independently, with agreement reached through discussion with a third person if necessary. Questions were classified as 'answered' if there was already an up-to-date, reliable systematic review of research evidence addressing the question that did not show ongoing uncertainty (identified via MEDLINE searches, not constrained to Cochrane reviews), or if there was already robust health-care guidance on the specific issue (identified via web searches). This was informed by the James Lind Alliance Guidebook [4].
3. All questions classified as 'unanswered' were sorted into research categories by three authors (J.H.B., L.H., N.L.: at least two for each question), in order to facilitate the next stages of the project. Where there was indecision or disagreement, agreement was reached through discussion with the third person. This third step was a *post-hoc* decision, made due to the large amount of unanswered questions generated.

Phase 2 survey—prioritizing uncertainties

All original survey respondents who provided an e-mail address were sent an e-mail in April 2016, with a web link to the second phase of the survey. The survey asked participants to rank the 15 research categories identified in the first phase in order of their importance (1–15), where 1 was classed as 'most important' and 15 as 'least important'. For each of the categories ranked in their top three, participants were then asked to rank the questions within that category (again, 1 was classed as most important).

Participants were given 2 weeks to respond. As an incentive, participants had the option of being entered into a prize draw for one of three £20 (or equivalent) vouchers.

After the survey was closed and responses collated, missing data were dealt with as follows: where participants had not attempted a ranking, i.e. no categories/questions in a set were ranked, the participant was excluded from the analysis for that set; where one value was missing in a ranking set and all others had been completed this was assumed to be through user or system error and the remaining, unused value was inserted; and where more than one value was missing in the ranking set, the median of the missing values was calculated and inserted into the missing data points.

The total ranks for each category/question were then added together. Total scores were ordered within their ranking set and given an overall rank (where 1 was deemed most important and higher numbers less important).

Workshop

The objectives of the workshop were to encourage stakeholders to discuss the prioritized questions, prioritize them further and discuss their reasoning. Methods were informed by James Lind Alliance guidance [4]. Potential workshop participants were identified from survey respondents and through Cochrane TAG members' knowledge of tobacco experts within appropriate stakeholder groups. Due to funding constraints (the workshop was only funded to provide travel expenses for members of the public), potential participants based in the United Kingdom were prioritized to maximize feasible attendance. One hundred and four potential attendees were invited via e-mail; 47 confirmed their attendance. Purposive sampling was used to ensure participants represented a range of stakeholder groups and organizations (within the United Kingdom).

The workshop took place in June 2016 at the University of Oxford. There were four dropouts on the day, and therefore 43 attendees. These included 16 members of the public (current smokers, ex-smokers and a carer of a person with smoking-related illness); nine researchers; six clinicians; two members of funding bodies; one public health campaigner; two health-care commissioners; one policymaker; one science journalist; and five stop smoking service providers.

The event was split into two sessions: (1) presentations and background information about Cochrane TAG and CTAG taps; and (2) the workshop. The workshop session was designed and introduced by an independent facilitation company. During this session members of the Cochrane TAG editorial team left the room so that attendees did not feel influenced by their presence, with the intention of reducing the likelihood of bias. Attendees sat around tables in seven groups of six or seven and each table was led by an independent facilitator. Activities included in the session were:

- individuals identified their top two priority research categories (from the top 10 identified in the survey);
- each table split into two teams and discussed and identified their top three categories;
- the whole table discussed and identified their top three priority categories;
- tables discussed the top three priority questions (identified from the survey) for each of their top three categories and decided what the key focus of each of their top three categories should be;
- each group presented a summary of their discussions to the other tables and members of the Cochrane TAG editorial team; and

- each individual was asked to vote on the three research categories they thought should be prioritized in future research at the end of the workshop.

All round-table discussions and the final summary feedback session were audio-recorded and transcribed. One author (N.L.) charted the arising themes and representative quotes, addressing why a category should or not should not be a research priority, using the Framework approach [6]. A second author reviewed this charting and provided additional suggestions (L.H.). A third and fourth author (J.H.B. and D.R.D.) provided a final review of the charts.

For the final voting activity, a card was displayed for each of the research categories deemed to be in the top three priority categories for each table. Each attendee was provided with five green-coloured dots and one red-coloured dot. They were asked to stick one green dot onto each of the three cards corresponding to the three research areas they felt should be given greatest priority, and asked to use the two remaining dots to give extra weight to their preferences where they wished. Attendees were asked to use the red dot to indicate the research category they felt should be given least priority. The total number of green dots on each category card was calculated and the number of red dots deducted. This gave a score for each category.

RESULTS

Phase 1 survey—identifying uncertainties

Three hundred and four survey respondents submitted 681 questions in the first phase of the survey. Three hundred and one of these 304 respondents provided demographic information (see Table 1); 34.2% (103 of 301) of participants identified as researchers. However, stakeholders such as health professionals, smokers and ex-smokers, guideline developers, research funders and policymakers also responded. Participants fell into a range of age groups, but most commonly (92 of 301; 30.6%) were aged 51–60 years. Females were slightly more likely to respond (171 of 301; 56.8%). The majority of respondents were living in the United Kingdom (169 of 301; 56.2%); the United States was the second most represented country of residence (49 of 301; 16.3%). The remaining participants (83 of 301; 27.6%) resided in a range of 26 other countries.

After removal of duplicates, 258 questions remained. Sixty (23%) were classified as already answered, 15 (6%) as unempirical and 183 (71%) as unanswered. The 183 unanswered questions were separated into 15 research categories (Table 2). Each category included between three and 21 unanswered questions. Full lists of these questions and their categorization can be obtained from the full project report [5].

Phase 2 survey—prioritizing uncertainties

One hundred and seventy-five of the 278 participants invited completed the survey (63%), with 154 full responses (no missing data); 174 of the 175 participants had provided demographic information previously (see Table 1). The characteristics of respondents to the second survey were similar to those responding to the first survey, suggesting that dropout was even across demographic groups. Participation was again most common in those aged 51–60 years, of female gender and who were resident in the United Kingdom. Participants were most likely to identify as researchers; however, again a range of types of stakeholder were represented.

The ranking of the 15 research categories and the top three ranking questions for each category are presented in Table 2. The rankings of all unanswered questions identified in the first phase of the survey are available in the CTAG taps full report [5].

Workshop

Priority research categories

Round-table discussions produced similar research priorities, resulting in eight priority categories throughout all workshop attendees: addressing inequalities; electronic cigarettes; initiating quit attempts; mental health and other substance abuse; population-level interventions; pregnancy; treatment delivery; and young people (in no particular order). Seven of these priorities (i.e. all but 'treatment delivery') matched with the top seven categories identified through the first and second stages of the survey. However, 'treatment delivery' was ranked 12th of 15 in the second stage of the survey.

During round-table discussions to reach consensus on the most important research categories, 11 categories were discussed. Table 3 provides a summary of the key points raised in these discussions. More in-depth charting of themes and associated quotes, as well as suggested actions for the tobacco control field, are available in the full CTAG taps report [5]. We report what was said verbatim. Therefore, this may not reflect the evidence base or clinical guidance. It also means that we can only report on the specific categories and themes discussed.

Cross-cutting themes

As well as the themes highlighted in Table 3, five themes were identified that ran through a number of categories, which we defined as cross-cutting themes. These were as follows.

Efficacy. Across categories uncertainty was still expressed about whether certain interventions work to help people to give up or refrain from taking up smoking; for example,

Table 1 Phases 1 and 2 survey participant characteristics.

Characteristic	*Category*	*Survey 1, n = 301 n (%)*	*Survey 2, n = 174 n (%)*
Stakeholder type[a]	Doctor	43 (14.3)	28 (16.1)
	Nurse	19 (6.3)	12 (6.9)
	Pharmacist	6 (2.0)	4 (2.3)
	Stop smoking adviser	48 (16.0)	28 (16.1)
	Other treatment provider	14 (4.7)	12 (6.9)
	Current smoker	14 (4.7)	6 (3.5)
	Ex-smoker	88 (29.2)	54 (31.0)
	Never smoker	53 (17.6)	33 (19.0)
	Health service commissioner	19 (6.3)	12 (6.9)
	Health-care guideline developer	9 (3.0)	6 (3.5)
	Researcher	103 (34.2)	61 (35.1)
	Research funder	2 (0.7)	1 (0.6)
	Policymaker	12 (4.0)	8 (4.6)
	Other	73 (24.3)	44 (25.3)
Age (years)	18–30	32 (10.6)	23 (13.2)
	31–40	64 (21.3)	30 (17.2)
	41–50	73 (24.3)	43 (24.7)
	51–60	92 (30.6)	58 (33.3)
	61–70	33 (11.0)	18 (10.3)
	71+	7 (2.3)	2 (1.2)
Gender	Male	130 (43.2)	74 (42.3)
	Female	171 (56.8)	100 (57.7)
Country of residence	Australia	12 (4.0)	8 (4.6)
	Belgium	1 (0.3)	0 (0.0)
	Brazil	2 (0.7)	1 (0.6)
	Canada	14 (4.7)	8 (4.6)
	China	1 (0.3)	0 (0.0)
	Colombia	1 (0.3)	1 (0.6)
	Croatia	2 (0.7)	0 (0.0)
	Denmark	1 (0.3)	1 (0.6)
	Egypt	1 (0.3)	1 (0.6)
	Finland	5 (1.7)	3 (1.7)
	Germany	4 (1.3)	2 (1.2)
	India	7 (2.3)	4 (2.3)
	Ireland	2 (0.7)	2 (1.2)
	Israel	3 (1.0)	3 (1.7)
	Italy	1 (0.3)	0 (0.0)
	Malaysia	1 (0.3)	1 (0.6)
	Netherlands	4 (1.3)	4 (2.3)
	New Zealand	7 (2.3)	3 (1.7)
	Norway	3 (1.0)	2 (1.2)
	Philippines	1 (0.3)	1 (0.6)
	Poland	1 (0.3)	1 (0.6)
	Spain	2 (0.7)	2 (1.2)
	Sweden	3 (1.0)	3 (1.7)
	Switzerland	2 (0.7)	2 (1.2)
	UK	169 (56.2)	90 (51.7)
	USA	49 (16.3)	29 (16.7)
	Uzbekistan	1 (0.3)	1 (0.6)
	Venezuela	1 (0.3)	1 (0.6)

[a]Multiple responses permitted.

Table 2 Research categories identified through the Cochrane Tobacco Addiction Group (CTAG) taps survey, their ranking and the top three ranking questions within each category.

Research category	*Definition*	*No. of questions in category*	*Survey category ranking (n = 175)*	*n (question ranking)*	*Top 3 questions*	*Workshop category ranking (out of 8)*
Addressing inequalities	Focus on reducing differences in tobacco use behaviour and health across groups, so that some groups do not have higher health risks than others, e.g. low- versus high-income groups	8	2	73	1. What are the most effective stop smoking interventions for smokers who are part of a hard-to-reach group? 2. Which interventions reduce the difference in the number of smokers in low socio-economic compared with high socio-economic groups most effectively? 3. Which interventions are the most effective to help people stop smoking in communities where smoking as a group has cultural and social value?	1
Alternative tobacco products	Focus on products other than cigarettes that contain tobacco, e.g. snus, chewing tobacco and waterpipes	12	9	37	1. Why do some people use more than one type of tobacco product? 2. How safe is snus compared to other tobacco products and electronic cigarettes, and is it more dangerous if used alongside cigarettes? 3. Are there ways to stop young people from using nicotine and tobacco products other than cigarettes?	–
Digital interventions	Focus on digital interventions, i.e. any intervention accessed and used by tobacco users in the form of a computer, mobile phone or internet-based programme or app	7	14	14	1. How effective and cost-effective are mobile smart phone and internet apps in helping people to quit smoking? 2. Do individual or group-based mobile smartphone interventions help more people to quit smoking? 3. Can mobile phones be used to help people to stick with their treatment while taking part in stop smoking studies?	–
Electronic cigarettes	Focus on e-cigarettes: battery-operated devices designed to deliver nicotine to users, without tobacco Nicotine is based within a liquid which is turned into a vapour	19	1	70	1. How safe are e-cigarettes, and are they as safe as other products? 2. How can we educate people effectively about the risks and benefits of using e-cigarettes? 3. Are e-cigarettes an effective and cost-effective aid to help people to stop smoking, and are they as effective as other products?	3/4

(***Continues***)

Table 2. (Continued)

Research category	*Definition*	*No. of questions in category*	*Survey category ranking (n = 175)*	*n (question ranking)*	*Top 3 questions*	*Workshop category ranking (out of 8)*
llness and chronic disease sufferers	Focus on tobacco users who have a short- or long-term illness	5	8	22	1. What is the most effective and cost-effective stop smoking intervention for smokers with long-term medical problems? 2. If smokers with illnesses that may be made worse by smoking are referred to stop smoking services does this help them to quit? 3. What is the most effective and cost-effective stop smoking intervention for smokers who are obese and have type 2 diabetes?	–
Initiating quit attempts	Focus on a tobacco user's decision to quit using tobacco	3	4	29	1. What is the most effective way to make people want to quit smoking? 2. What makes people decide to quit smoking? 3. Why has the number of people who are trying to quit smoking reduced in the United Kingdom?	3/4
Medications	Focus on medications used to help people change their tobacco use	16	15	14	1. What is the most effective medication current smokers, who do not want to quit, can use to reduce their tobacco use, and what is the best way to use it? 2. What are the most effective medications or combinations of medications to help people to quit smoking and how should they be used? 3. What is the most effective and cost-effective way to use NRT (dose, length of use, etc.) so that people do not relapse to smoking after they have quit?	–
Mental health and other substance abuse	Focus on tobacco users with mental health problems and/or other substance abuse issues (e.g. cannabis or alcohol abuse), or to investigate issues related to mental health	13	3	43	1. How can we encourage and help mental health workers to offer stop smoking services to their patients with mental illness? 2. What is the most effective and cost-effective way to help people with mental health problems to quit smoking inside and outside of mental health treatment settings? 3. What is the most effective and cost-effective way to help people who also have drug and alcohol problems to quit smoking?	5/6

(*Continues*)

Table 2. (Continued)

Research category	*Definition*	*No. of questions in category*	*Survey category ranking (n = 175)*	*n (question ranking)*	*Top 3 questions*	*Workshop category ranking (out of 8)*
Nicotine and tobacco risk	Focus on risks, associated health problems and addiction potential of tobacco and nicotine; including ways to reduce harm in tobacco users who cannot quit (harm reduction)	11	10	28	1. How safe is nicotine when it is delivered in non-tobacco products, and how does this compare to when it is delivered in tobacco products? 2. How addictive is nicotine, and how does this compare between different nicotine products (e.g. smoking tobacco, other tobacco products, e-cigarettes, nicotine replacement therapy)? 3. If smokers reduce the number of cigarettes they smoke does this reduce the harm caused by their smoking?	–
Population-level interventions	Focus on interventions related to tobacco use, targeting whole populations rather than individuals, e.g. government policies	21	5	34	1. Are any current interventions aimed at the general population effective in reducing the number of people who smoke and the harms linked to tobacco use? If so, which ones? 2. Does plain packaging stop people from taking up smoking? 3. Do interventions which aim to change tobacco related social norms reduce the demand for tobacco?	7/8
Pregnancy	Focus on tobacco use and quitting during pregnancy	10	6	27	1. How safe are e-cigarettes when used during pregnancy, and are they as safe as other products? 2. What are the most effective and cost-effective methods pregnant smokers can use to give up smoking? 3. Are e-cigarettes an effective and cost-effective aid to help people to stop smoking during pregnancy, and are they as effective as other products?	7/8
Smoking bans and second-hand smoke	Focus on tobacco smoking bans and the second- and third-hand smoke given off by cigarettes	11	13	19	1. Is the amount of second-hand smoke people are exposed to linked to the effect this has on their health? 2. If smoking was banned in all public places would this have an effect on the number of people smoking and the health problems linked to smoking? 3. What are the most effective interventions to reduce the amount of second-hand smoke present in flats and apartment buildings?	–

(***Continues***)

Table 2. (Continued)

Research category	*Definition*	*No. of questions in category*	*Survey category ranking (n = 175)*	*n (question ranking)*	*Top 3 questions*	*Workshop category ranking (out of 8)*
Smoking treatment methods excluding medications	Focus on any treatment methods for tobacco use, apart from treatments in the form of medications, but including research into behavioural support interventions	20	11	17	1. Does the amount of behavioural support a smoker receives influence how likely they are to quit? If so, how intensive does support need to be to result in success? 2. Which elements of behavioural support are most effective to help people quit tobacco use? 3. How effective are different stop smoking treatments when provided in the 'real world'?	–
Treatment delivery	Research focusing on the best ways to deliver treatment for tobacco dependence	13	12	21	1. How can we make sure that all health-care providers provide stop smoking treatment which research has been found to be effective, safe and cost-effective? 2. What type of health providers provide the most effective support to help people to quit smoking, and how much training do they need to be most effective? 3. What are the most effective interventions that can be used in primary care (e.g. doctors' and dentists' surgeries, pharmacies) to encourage more people to use stop smoking services and to give up smoking?	2
Young people	Research focusing on tobacco uptake, use and treatment in young people	14	7	31	1. What is the most effective and cost-effective way to stop young people from starting to smoke, in particular those in hard-to-reach groups? 2. Are there effective interventions to stop early trials of smoking from turning into tobacco addiction? 3. How can we stop the children of smokers from starting to smoke themselves?	5/6

Table 3 Reasons for and against the prioritization of research categories raised during workshop discussions.

Research category	*Reasons why category should be prioritized*	*Reasons why category should not be prioritized*
Addressing inequalities	• Currently neglected area • UK National Health Service (NHS) priority • Smoking causes inequalities • Can be addressed by multiple intervention types • Addressing it is a moral issue; neglecting it is immoral	• Risk of alienating certain groups, as targeting can be ineffective or offensive • Some groups may be neglected whilst others are being prioritized
Alternative tobacco products	• Related to recent, emerging problems, so still needs investigating • Potentially a gateway to other tobacco use (i.e. cigarettes)	Not discussed
Electronic cigarettes	• Safety: any long-term health effects still need to be established • Due to safety queries health professionals are unsure how to advise patients • Potential use as a smoking reduction and cessation aid still needs to be investigated • Electronic cigarettes may be more attractive cessation aids than pharmaceuticals, especially in young people • A great deal of misleading information is currently circulated on the topic • Potentially a gateway to tobacco use—needs to be investigated	Not discussed
Illness and chronic disease sufferers	• Important to improve the quality of life of people with chronic illness • To prevent death and thereby prolong life • To reduce the burden on healthcare services, such as the NHS	• There is already research covering this that should be used primarily • Should be a clinical priority but not necessarily a research priority
Initiating quit attempts	• There has been a decline in quit attempts made • It is difficult to motivate people to quit • Finding ways to motivate quitting is important as it can take many prompts to instigate a quit attempt • Finding different ways to motivate quitting is important as different things may work for different people and people may need to make multiple attempts to quit successfully • Need to maximize the number of people who use methods/services known to be effective to quit	Not discussed
Mental health and other substance abuse	• Addiction is a mental health issue; the two are closely linked and impact upon one another • Quitting smoking can improve mental health • Although the number of people impacted will be relatively small, the impact on individuals is likely to be high • Likely to have wide societal impact due to the costs associated with mental health and substance abuse impact on society in general • Smoking has an impact on the metabolism of many mental health medications, therefore reducing smoking in people with mental health problems could improve or simplify treatment • In some cases mental health workers are expected to enter people's homes; if the person is a heavy smoker this has health implications • There are misconceptions around the enforcement of smoking bans in mental health units, i.e. that this may lead to unrest, that need to be challenged	• Only impacts upon a small population subset, unlike a category such as 'population-level interventions' that has the potential for wider impact • Cigarette smoking may help to reduce anxiety in people with mental health problems

(***Continues***)

Table 3. (Continued)

Research category	*Reasons why category should be prioritized*	*Reasons why category should not be prioritized*
Nicotine and tobacco risk	• Research is needed to challenge the perception that medicinal nicotine may be harmful, in order to maximize the use of nicotine replacement therapies	Not discussed
Population-level interventions	• Most likely category to have a high mass impact • Do not have as much information as needed about which population-level interventions are most effective • Due to mass impact of these types of interventions they are likely to be cost-effective; however, more evidence and communication of this is needed to encourage policymakers to adopt these approaches • Population-level interventions improve equity, as they are administered across population subgroups	• Less likely to have a meaningful impact on the individual, when compared to a category such as 'mental health and other substance abuse' • These types of interventions could increase inequalities, as they may have more negative consequences in certain population subgroups
Pregnancy	• Pregnancy is a key life stage, and quitting smoking during this time has a high and clear line of impact, as it affects both the mother and their unborn child • A key area for future research is to find ways to prevent relapse in those smokers who quit during pregnancy, but then return to smoking after the baby's birth	Not discussed
Treatment delivery	• There is a need to inform better delivery of smoking cessation treatment and training in health-care professionals. This could, in turn, increase the success of tobacco users in giving up • Better delivery of smoking cessation treatment and training could also increase the reach of treatment for stopping smoking	Not discussed
Young people	• Neglected area in the past, partly because stop smoking services are assessed based on quitting rather than prevention • Current preventative approaches are not well targeted to young people, as they focus on long-term consequences • Early use in the young is likely to lead to addiction and long-term use. Tackling the problem early prevents problems emerging • Many current interventions are not based on high-quality evidence • There are youth interventions and marketing led by the tobacco industry that need to be counteracted • Alternative, less studied forms of tobacco (e.g. shisha) are becoming more popular, and these forms may be more likely to appeal to young smokers in particular	• A better way to prevent the uptake of smoking in young people may be to help adults to quit, rather than to invest in directly preventative youth interventions, as this changes social norms • Smoking in young people is a less immediate problem than smoking in adults, as experimentation is normal in young people and resulting health problems are less pressing • Smoking prevalence has already dropped in young people due to successful intervention and so this may not be the area where most ongoing research needs lies

electronic cigarettes. This was a motivator for why many categories were seen as a priority.

Comparing active interventions. As well as establishing the effectiveness of individual interventions, it was also raised across a number of categories that work was needed to focus on the relative efficacy of different interventions; for example, different population-level interventions or aids to quitting, to establish which should be implemented in practice.

Cost-effectiveness. Another common theme was cost-effectiveness. This was raised as an important consideration when assessing the practical application of interventions in general, and one that had often not been addressed.

Addressing inequality. As well as arising as a category in its own right, this theme came up as important across other categories. For example, population-based interventions were described as both a means to increase and decrease equity across groups. A reduction in health inequalities was recognized as a main aim of the UK National Health Service (NHS).

Using different types of evidence (non-randomized controlled trials (RCTs)]. Historically, Cochrane have focused on

evidence from randomized controlled trials to establish intervention effectiveness. However, it was recognized for a number of categories, for example 'mental health and other substance abuse' and 'population-level interventions', that this is not always the only or best way to assess how useful an intervention may be. Non-RCT evidence is being used increasingly by Cochrane where this is the best or only way to assess an important intervention. workshop discussions suggested that this needs to continue to be developed, both within Cochrane and the wider research and health-care community.

Final voting on research category prioritization

For the final workshop activity attendees were asked to vote on the eight priority categories identified through the round-table discussions. As a result, 'addressing inequalities' ranked most highly at the workshop, with a score (38) double that of 'treatment delivery' (19), which ranked second. Addressing inequalities ranked second (to electronic cigarettes) in the second phase of the survey; therefore, this consensus was similar to the one reached by survey participants, as were most other rankings. The exception to this was 'treatment delivery', which jumped from ranking 12th of 15 in the survey to 2nd in the workshop. See Table 2 for the full rankings of the eight categories voted on at this stage.

DISCUSSION

This is a report of a priority-setting, stakeholder involvement exercise carried out for the Cochrane Tobacco Addiction Group's (TAG) 20th anniversary. The project comprised three main stages: two surveys and a workshop, through which Cochrane TAG's stakeholders were asked to identify and prioritize areas and questions that still need to be addressed in the field of tobacco and smoking research.

Statement of principal findings

The first stage of the survey generated a large number of research questions that stakeholders felt had yet to be answered by research. Review of these by the authors confirmed this was the case for a large proportion of the questions (183), according to the criteria suggested by the James Lind Alliance [4]. These questions were categorized into topic areas by the project team. The combination of the surveys and workshop prioritization discussions resulted in eight top categories: 'addressing inequalities'; 'treatment delivery'; 'electronic cigarettes'; 'initiating quit attempts'; 'young people'; 'mental health and substance abuse'; 'population-level interventions'; and 'pregnancy'. As well as the reasons for prioritizing the pre-specified topic categories discussed at the workshop, a number of cross-cutting themes emerged throughout the day. These were: (1) a continued focus on research into the effectiveness of interventions to prevent or stop people from smoking; (2) research into the relative efficacy of interventions, to determine what should be implemented as a priority; (3) more research into the cost-effectiveness of interventions to inform implementation; (4) addressing inequalities as a priority across tobacco research areas; and (5) using a range of research modalities to evaluate tobacco cessation and prevention interventions.

It is important to note that in the case of all findings from the project the opinions expressed are those of the participants, and have not been amended for the purpose of this write-up. Therefore, the beliefs presented here may not always be supported by research evidence or be in-line with the opinions of those who may be regarded as 'experts' in the tobacco control community or the scientific communications and dissemination field. For example, it was noted that smoking may be of benefit in mental health communities, as it could calm anxiety symptoms. This is something that is not supported by research evidence and, in fact, the opposite has been found to be the case [7]. Therefore, our findings should be considered within this context, and further steps for Cochrane TAG will include developing an action plan for the group that takes our findings into account alongside the wider body of research evidence.

Strengths of the project

This project blurred the boundaries between scientific research and public engagement activity, which made it relatively unique. As well as the potential limitations that this presented, discussed below, we also felt that this provided some significant benefits. First, the work of Cochrane TAG, and the research community more generally, has previously been informed largely by researchers. Although these researchers sometimes have joint interests in the themes of tobacco and smoking cessation, such as clinicians or ex-smokers, this can mean that the research carried out is based on a number of assumptions. These can range from the questions that need to be answered to inform health-care to the outcome measures that are likely to be relevant to intervention users. Involving a range of stakeholders in the process of informing research reduces the assumptions that need to be made, and maximizes the likelihood that the resulting research is needed, and will ultimately be useful and inform decision-making and practice.

Another strength of the general methodology was that we approached the prioritization process from two different angles: the surveys and the workshop. This allowed for the triangulation of findings—i.e. using data from a number of

sources to strengthen confidence in the findings [8]. As well as demonstrating that certain topics were judged consistently to be of high priority, i.e. 'addressing inequalities' and 'electronic cigarettes', it also allowed differing perspectives to emerge and to be explored. An example of this was the emergence of treatment delivery as a key category at the workshop, despite being ranked as 12th out of 15 categories in the survey. This appeared to be because discussion allowed some members of the group to put forward ideas that had not been considered previously by others, but when raised were deemed to be of importance.

There were also three more specific elements of the methods used that seemed to work well. The first was the voucher incentive used to encourage participants to respond to the second wave of the prioritization survey. This appeared to result in a good response rate, with the majority of the participants opting-in to the prize draw, and 63% of those people who responded to the first wave responding to the second wave, despite only a 2-week response period. In terms of the workshop, two measures were taken to try to reduce pressure that participants may have felt to discuss things in a way deemed favourable to the Cochrane TAG team, and to reduce any other bias that may have occurred through Cochrane TAG being involved in discussions. The first was the decision to employ an independent facilitation company to design and run the workshop element of the project. We had not carried out a project of this type before, and so wanted to ensure that the workshop was run in a manner that maximized useful output. We also wanted to ensure that there was no opportunity for any unconscious bias to creep into the process based on the team's preconceptions of what may be found. The second approach implemented to control for this was that all members of the project team left the room during the workshop process. The team did, however, return at the end of the sessions so that they could thank attendees, and so that delegates could feedback briefly on their discussions.

Limitations of the project

As mentioned above, the mixed methodology and stakeholder engagement elements of the project presented limitations as well as benefits.

First, ideally, we wanted the findings of the research to be applicable globally, particularly as Cochrane is a global organization. Although we aimed to do this, and this was reflected in our methods and recruitment procedures for the surveys, just over half of the respondents were based in the United Kingdom (which is the base of Cochrane TAG). This was due to the time and funding constraints on the project—an extension of either of these elements would have allowed us to employ more inclusive recruitment techniques. However, despite this, residents of 28 countries were represented throughout the survey. We also aimed for a wide range of stakeholder representation. Again, this was difficult to address, with approximately a third of respondents identifying as researchers; however, there was a range of different groups represented and greater time and resources would have enabled us to maximize this involvement further. Due to funding constraints we were only able to fund attendance for members of the public to the workshop, meaning that attendance was more difficult for those who did not have work-based funding to attend such an event, and who may have been travelling a substantial distance to attend. It also made attendance inconvenient for people, i.e. clinicians, whose usual work commitments made it difficult for them to attend something that would not normally be considered part of their job role.

Secondly, we did not expect that the respondents to the first survey would generate such a large number of unanswered questions. To make ranking the questions feasible in the second phase of the survey, a *post-hoc* decision was made to categorize the research questions into categories. We then asked participants to only rank the questions within their top three categories. This made the second phase of the survey a little more complex and unwieldy than it would have been otherwise, and may have deterred some people from responding. It also limited the size of the samples ranking each set of questions, potentially making the results less representative of the whole sample. Finally, categorization was performed by three members of the research team, and it is possible that other people would have made different decisions around defining and organizing categories.

Thirdly, some parts of the audio-recordings at the workshop by the working groups were obscured by background room noise, because all discussions took place in the same hall. Consequently, some parts of conversations were missed.

Fourthly, there are some points for consideration regarding the final dot-ranking exercise at the workshop. We chose to quantify the voting by adding together the green dots on the cards and subtracting any red dots. This is only one possible method of interpreting this exercise, and other methods may result in different conclusions. We also cannot give a completely accurate account of how many workshop delegates completed this voting exercise, as it was not enforced on the day and we did not monitor this. If it were assumed that all delegates followed instructions exactly, then through counting the red dots used across the activity (one per person) we could conclude that 27 of the 43 delegates took part. In addition, as this was an open voting process, it is possible that the group processes may have influenced the way people voted or deterred them from voting. However, this exercise was not intended to be a rigorous scientific test, and therefore

should be used only as a guide to people's feelings at the end of the process, and a small part of the rich data sources available.

Fifthly, it is possible that the respondents and their responses could be biased towards the topics and methods used by Cochrane TAG. However, we tried to minimize as much as possible any possible influence we might have over the results: we attempted to recruit from a broad range of stakeholders, many of whom were unfamiliar with our group at the outset; we made it clear in the instructions that we were interested in any unanswered questions in tobacco control, not just in those relevant to the work of our group; the survey was designed in an open-ended way so as to not be prescriptive regarding answers; and members of TAG were deliberately absent during workshop discussions in order to minimize any potential influence of the group on these exercises. Although we acknowledge that bias might still persist, we are encouraged by the fact that many of the methods and questions that emerged from this process are not directly relevant to the work of TAG.

Finally, we have not considered the contributions to this project categorized by stakeholder type, and therefore it is difficult to conclude how adding different types of stakeholder input to the prioritization process has added to what the group would usually do to inform their outputs. It would have been impossible to do this for the workshop, as we were unable to differentiate between the voices on the audio recordings. However, we are confident that this process has generated suggestions for future work beyond what would usually be generated by Cochrane TAG's typical engagement with researchers in the field. When liaising with researchers this has usually been to discuss specific potential review topics; as well as doing this, this project has generated more general suggestions for development across the group's portfolio, for example, the addition of cost-effectiveness information in reviews and the consideration of study types outside RCTs.

Implications of findings

The key motivations for carrying out this project were twofold to: (1) inform the wider tobacco community and (2) inform Cochrane TAG specifically. In the first instance, the project did generate many research questions deemed to be both unanswered and a priority for future research. By sharing these, we hope that we can help to inform and justify the work of researchers, and also to help research funders to prioritize the work that they fund. However, as mentioned previously, discussion findings need to be considered alongside existing evidence and expertise when planning implementation.

Cochrane TAG aim to take these findings forward in a number of ways. We hope to use them to inform our output during future years in the form of new reviews, updated reviews and changing the scope of existing reviews. We plan to map the priority questions identified as part of the survey onto our existing portfolio and decide where this should be expanded or altered, and prioritize based on this. The results of this mapping exercise will be made available to the public. Where new reviews are commissioned we will seek author teams to carry out this work.

CONCLUSIONS

In conclusion, this project highlighted many unanswered questions in the field of tobacco control. Stakeholders provide a rich source of information on how these should be prioritized, and use of this resource has the potential to maximize the likelihood that findings of research are useful and implemented. We hope that researchers and funders will be able to use the priorities identified to inform future practice, as Cochrane TAG will use them to inform its work. Future prioritization work would benefit from targeting non-US and non-UK stakeholders explicitly and from examining where priorities may differ based on stakeholder group.

Declaration of interests

L.H., J.H.B. and D.R.D. have no declarations of interest. N.L. was a collaborator on the Preloading Trial (a trial of nicotine patch preloading for smoking cessation), which completed in 2016. The excess treatment (nicotine patches) for the trial was supplied free of charge by Glaxo Smith Kline (GSK). However, GSK had no further involvement in the research, and this has no impact on the reported work.

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