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What features should an effective system for declaring and managing conflicts of interest in healthcare have? An adapted Delphi study of key stakeholders in the UK

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ABSTRACT

Objective To identify views and establish agreements of key stakeholders on the features of an effective system for declaring and managing conflicts of interest in healthcare.

Design A modified Delphi study consisting of two surveys and semi-structured interviews. Surveys included closed and free-text questions.

Setting and participants UK, purposefully and generally invited participants including academics, researchers, healthcare professionals, regulators, patients and citizens from 10 countries, during 25 August 2024 and 20 January 2025.

Main outcome measures Quantitative and qualitative analysis of two surveys and 21 interviews. Descriptive statistics were used to describe the sample and analyse closed survey questions. Thematic analysis was used to analyse free-text survey responses and interview data. Results were synthesised to describe the perceived importance and purposes of declaration of interest systems.

Results In the first survey round, 616 invitations were sent, along with social media advertisements. 237 questionnaires were returned and 200 full responses were analysable. 129 respondents consented to recontact on the online form. In the interview round, 37 invitations were sent and 21 interviews completed (response rate 59.5%). Invitations for the second survey were sent to all 129 participants who consented to recontact. 91 responses were received and 89 questionnaires were analysable (response rate 82%). Features of ideal systems to declare and manage the interests of healthcare professionals identified by participants were categorised under seven themes: regulatory issues, the healthcare environment, human vices, professional virtues, the use of judgement, features of a better system and patients and public. There was broad agreement on the need for transparency and clarity in declaration systems. The most agreed features were: clarity on what information was needed; it should be a centralised 'deposit' for all declarations; it should be publicly accessible, educating and informing people accessing and using the register. Having a lifelong personal identifier, some flexibility in declarations and some privacy features were also rated highly. Respondents were less concerned about scrutiny or a loss of trust. Small numbers of participants raised concerns about serious adverse effects, including loss of privacy, personal safety and the potential of information to contribute to conspiracy theories. There were also major disagreements between participants concerning whether or not healthcare professionals should work with industry, and whether conflicts of interest from working with industry can be safely managed. Individuals with each perspective felt they were acting ethically.

Conclusions While many agreements were identified, disagreements were also found. If improved declaration systems are to be accepted by professionals and useful to regulators, patients and citizens, the potential for benefit and harm from new declaration systems must be addressed.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Wide range of participants with diverse views expressed.
- ⇒ Multidisciplinary research team.
- ⇒ First Delphi study exploring practical considerations of using declarations and improvements.
- ⇒ Participants may have been unusual and biased towards middle/older age.
- ⇒ Dissenting views may have been missed.

INTRODUCTION

There are longstanding concerns about the extent and impact of conflicts of interest (COIs) in medicine.[1 2] Concerns about how healthcare professionals should declare these and how they should be managed have resulted in various schemes including voluntary, contractual and compulsory disclosure by professionals and also by industry. For example, in the USA, the Physicians Payments Sunshine Act (2010) requires manufacturers of drugs, medical devices and medical and biological supplies to publish details of payments made to healthcare professionals.[3] In the UK, information about transfers of value from the pharmaceutical industry to professionals is published by consent on Disclosure UK, a platform hosted by the Association of the British Pharmaceutical Industry since 2016.[4] Additionally, in the UK, National Health Service (NHS) Trusts and primary care organisations also publish registers of interest from various groups of professionals.

In the UK in 2020, the Independent Medicines and Medical Devices Safety Review was published.[5] It responded to the crisis in UK medicine caused by failures of regulation and governance, which led to patient harms via the harmful use of surgical mesh (used in pelvic surgery and associated with chronic pain), the pregnancy test Primodos (which caused congenital malformations of the children whose mothers used the drug) and the epilepsy drug sodium valproate (which harmed babies whose mothers used it during pregnancy). The Review noted that COIs in healthcare professionals likely contributed to patient harm. For example, surgical mesh was promoted by doctors who gained financially from increased use, despite a lack of evidence on safety.[6] The Review recommended mandatory declarations of interest (DOIs) from industry, teaching hospitals, research institutions and individual clinicians.

In the UK, many healthcare professionals are asked to declare their interests for multiple reasons—for example, as an employee of an NHS Trust, as a member of a guideline committee, as a contributor to a journal article or as a speaker at a conference. Previous analysis of a selection of DOIs requested by international medical and NHS organisations revealed substantial variation in the content of interests requested, including time scales, financial thresholds and categories (eg, professional, personal and political interests, in addition to financial interests).[7] Definitions of COIs also varied. The NHS England Grant review of 2016 recommended the standardised use of declaration templates by NHS organisations to request and record declarations.[8] Analysis in 2020 found that while NHS organisations were compliant in publishing declarations, most were not doing so according to guidance.[9] Further, a UK study of citizens and professionals tasked to find a professional's declaration found they were difficult to locate and interpret.[10]

Internationally, concerns have been raised that transparency through open DOIs may not adequately convey information about the potential for bias. Indeed, these declarations might increase harm by increasing trust in conflicted advice.[11] In the USA, while the aim of the Physicians Payment Act included to 'deter inappropriate financial relationships" and "permit patients to make better informed decisions', there is evidence that these aspirations have not been met.[12] Nevertheless, professional organisations in the UK support a central registry of interests.[13]

The introduction of a statutory system to declare interests would therefore face multiple challenges. First, the purpose of a system must be established. Would it aim to simply achieve transparency for professionals, citizens, patients and other users, or would it be part of a system which provided information to assist accurate interpretation of its meaning for the management of declared interests? Second, which interests should be included? While Disclosure UK is concerned only with interactions with the pharmaceutical industry, numerous other financial conflicts are possible, for example, patents, interactions with the technology and medical devices industries, shareholding and consultancy to lobbying organisations. Further, non-financial interests, such as loyalty and intellectual interests, are also potential conflicts. Third, with the NHS under ongoing stress, further bureaucratic impositions on professionals may be unpopular, drain morale and impose significant opportunity cost. Finally, given the evidence base, it is not certain that a statutory system will reduce the negative impact of COIs.

Despite efforts to obtain DOIs from NHS staff, authors of journal manuscripts and guideline committee members, there is little information about the experiences of those declaring and managing interests.[14 15] We therefore sought to delineate what the features of an optimal system for declaring and managing interests would consist of according to key stakeholders. A Delphi study was chosen as a means to understand a wide range of views and reach conclusions on what were perceived to be the most important features of an effective DOI system.

METHODOLOGY

The overall study design was a modified Delphi method with three rounds.[16]

1. Survey of key stakeholders (see Participants below). This survey asked about participants' experiences and views of managing DOIs. It also asked if they would be willing to take part in an interview and/or follow-up survey and consent was sought for contact.
2. Semi-structured interviews of selected participants who had agreed to be contacted for interviews and gave signed consent. Participants were selected to represent different backgrounds and viewpoints. The aim was to understand the rationale for diverse viewpoints.
3. Second survey of all participants from round one who had consented to be recontacted. The survey was developed based on responses to the first survey and semi-structured interviews. The aim was to delineate agreement and disagreements regarding the features of an ideal DOI system. We did not seek to achieve consensus. Instead, we sought to understand what features of a declaration system would be acceptable to a diverse group holding divergent views and where disagreement might remain.

Participants

Participants were identified through an iterative process. 86 key UK organisations were identified, via an iterative online search, that represented different stakeholders such as Royal Colleges, regulators, academics, the pharmaceutical and medical device industry, and patient groups. The list was discussed with the research team and expanded using internet searches and reference list searches. Health journalists and editors in the lay and specialist press and consultants/public relations companies working for the pharmaceutical industry were included. Academics included those with expertise in ethics, philosophy, law, business, management and those who had published work or policy documents in this area. Patients and lay people included individuals involved in campaigns around medical scandals and individuals serving as lay representatives in medical organisations. 616 separate invitations were sent. Invited organisations are listed in online supplemental table S1.

Snowball sampling was used during the interview round: participants were asked if they could think of any organisations or individuals who should be invited, and survey invitations were sent to all new suggestions.[17 18]

Data collection

The surveys used the Qualtrics survey tool, hosted at the University of St Andrews. Both surveys were initially tested and iterated with a small group of colleagues.

1. For the first survey, 616 invitations were sent by email to individuals or organisations; links to the survey were also distributed via personal and institutional accounts of team members inviting wider participation.[19] The first survey started with a short preamble about COIs followed by closed-ended and open-ended (free-text) questions (online supplemental appendix 1). Closed questions used drop-down menus and tick boxes. Free-text options were provided to specify the 'other' categories and allowed participants to use as many words as they needed. The following information was requested: job title, qualifications and time since qualification, regulatory body, sex, age band, job role in relation to declaring/managing COIs (eg, declarer, manager, organiser), personal experiences of declarations, request to engage further with the research process and whether they wished to receive the eventual published paper. Free-text questions started with the preamble: *Please tell us, using as many words as you need to: What are your professional or personal experiences of asking about, making, managing or finding declarations of interests? These might be: the ways you have had to make a declaration, or explain it, or the ways you have had to read about or ask about the declarations other people have made.* After this, responses were requested for three further questions: (1) what has worked well, (2) what has worked less well and (3) what would make the current system of declarations better.

   Two further weekly email reminders were sent before a non-response was recorded. Participants were advised they could forward the email invitation to colleagues. Response demographics were regularly reviewed with the research team, and deficiencies in representation were addressed with further specific invitations. A total of 237 surveys, completed over an 8-week period, were returned. After removing surveys with no data, 200 questionnaires were retained for data analysis.
2. Based on the results of the first survey, potential interviewees were identified from the participants who consented to be contacted for an interview and further surveys. Respondents were selected based on demographics and content of survey responses, aiming for diversity in views, experiences, age and background. Invitations were sent in batches of five, with interviewers selected on the basis of availability. However, if interviewees were known personally to a member of the research team, an interviewer was selected who did not have such a relationship. Interviews were semi-structured, using open questions (online supplemental appendix 2). Invitations ceased when, after discussion, the research team considered that saturation was reached. 37 invitations were sent, and 21 individual interviews were completed by KM, MM and KO, lasting between 24 and 40 min. One of those interviews was with two (colleague) participants. 20 interviews were completed and transcribed using Microsoft Teams, 1 interview was completed over the phone and transcribed. All interviews were annotated by each interviewer.
3. The second survey requested the same demographic information and experience using declarations as the first survey. Questions reflected findings from the first survey and the interviews. Sliding scales were used to ascertain the relative importance assigned to potential purposes of declarations and the most important features of a declaration system. A free-text option was given to add any comments or clarifications (online supplemental appendix 3). The survey was sent to 129 people. 91 surveys were returned with some information (71% response rate). 2 surveys were removed because of missing data, with 89 surveys retained for analysis. The data collection process is visualised in figure 1.

Patient and public involvement

AW, a member of Fife Community Advisory Council, contributed to the protocol design and survey questions, attended meetings where results were discussed, and is a coauthor. Patients and citizens were actively sought to participate in all parts of the study.

Data analysis

For survey 1 and survey 2, free-text responses were coded in Excel and in NVivo using thematic analysis.[20] Closed questions were first visualised in the Qualtrics software and exported to MS Excel and Stata V.16.1. Descriptive statistics were used to describe the sample and distribution of responses to the closed-ended questions. Free-text responses, which had an unlimited word count, were analysed thematically.

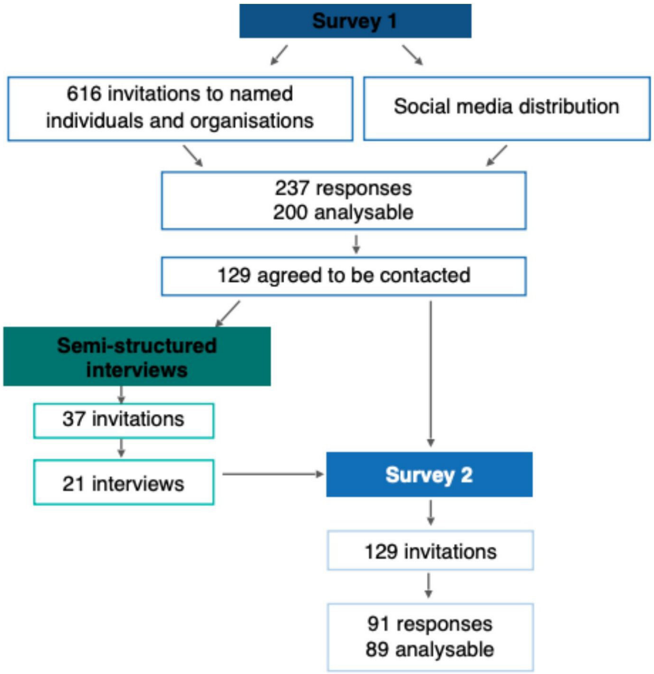

Figure 1 Data collection process.

Familiarisation with the data occurred during the interviews, while editing MS Teams transcripts, and through additional reading. Coding was done initially in Excel by MM and KM and imported to NVivo for further refinement. Development of codes and themes was discussed with the team, and subject to iterative refinement. Interview outcomes and survey 1 responses were used to generate the questions for the second survey.

Survey responses and interview data were analysed individually and brought together into themes after discussion.

Credibility strategies/prevention of bias

Several strategies were employed. Different perspectives in the team were achieved by combining different backgrounds and expertise (sociology, clinical medicine, management, philosophy, evidence-based medicine, clinical research, patient perspectives) with discussions at key points during the study. Consensus was built through discussion and reflection at our regular meetings. Sampling bias was mitigated through deliberately seeking contrary and conflicting opinions, and via regular reflection on respondent demographics and targeted invitations to fill identified gaps. Specific routes were employed to engage with under-represented groups. For example, the use of batch invitations enabled targeted invitations to address this. For example, lower numbers of younger participants were noted while carrying out survey 1 and invitations sent to social networks with younger memberships. Interviewers did not interview any participants they knew personally.

RESULTS

Survey 1

200 questionnaires were analysed. Survey demographics and responses to the closed-ended survey 1 questions are shown in online supplemental table S2. The response rate was different for each question.

Closed-ended questions

86% of the respondents were based in the UK, with others from the USA, Australasia and Europe. 51% said they were male, 46% female and 2% gave no response. Of the 197 participants who gave an age range, almost half were aged between 45 and 64 (49%).

199 respondents described their role(s). 21% were solely healthcare professionals (HCPs), 18% selected both HCP and academic/researcher, 5% of HCPs included managerial responsibilities in their role description and 4% of HCPs reported having a role in policy or government. 17% of respondents were solely in academic/research roles, and 8% had academic/research roles combined with lay or other roles. 4% of respondents had managerial responsibilities in different combinations, 4% were journal editors or journalists, 4% were solely in lay person or patient roles and 1% were healthcare regulators. The majority of the respondents (49%) had the General Medical Council (GMC) as their regulator, 29% reported having no regulator and 13% stated ‘other’ regulator.

142 respondents reported on their experiences of DOIs. 86% had made a declaration about their own interests, 77% had asked about or looked for someone else’s conflicts or DOIs and 55% had to understand or manage someone else’s declaration of interest.

Open-ended questions

Coding was initially done by each question. However, this strategy was changed to allow flexible coding as some responses related to a different question or referred to a response provided under a different question. Online supplemental table S3 shows the initial coding of open-ended questions.

Interviews

Interviewees profile is shown in online supplemental table S4.

Transcripts were coded and thematically analysed. The development of the themes was discussed with the team. Seven main themes with subthemes are shown in online supplemental file 5.

Survey 2

129 invitations were sent and 91 responded. 21% were solely HCPs, 18% selected both HCP and academic/researcher, 5% of HCPs included managerial responsibilities in their role description and 4% of HCPs reported having a role in policy or government. 17% of respondents were solely in academic/research roles, and 8% had academic/research roles combined with lay or other roles. 4% of respondents had managerial responsibilities in different combinations, 4% were journal

editors or journalists, 4% were solely in lay person or patient roles and 1% were healthcare regulators. 49% of 178 respondents had a GMC as their regulator, 29% reported having no regulator and 13% stated 'other' regulator.

The demographics and responses to the closed-ended questions are shown in online supplemental table S6. 80 respondents provided information, the question allowed for inclusion of multiple categories. 23% were solely academics/researchers, 14% were healthcare professionals and 21% healthcare professionals and academic/researchers. 6% defined themselves as a patient/lay person and 3% had managerial responsibilities. The rest of the respondents had multiple role combinations, including roles in policy and government, journalists and healthcare regulators. Most respondents were aged between 45 and 64 (54%) with 22% aged under 44. 64% were male and 90% were based in the UK. 50% of the respondents were regulated by the GMC, 4% were regulated by the Nursing and Midwifery Council, the General Dental Council or the General Pharmaceutical Council. 37% had no regulator. Most (84%) were liable to make DOIs.

Respondents were asked to rate four statements using sliding scales (figure 2).

1. DOIs may be requested for several reasons. How important do you think the following purposes are? 0 is not important, 10 is extremely important.
   Respondents believed that the purpose of declarations was most important to achieve transparency. Smaller numbers rated highly the need to help others make informed decisions and motivate professionals to avoid bias.
2. The second set of questions included statements about DOIs and COIs: 'How much do you agree with the following? 0 is totally disagree, 10 is totally agree'.
   There was strong agreement that professionals should discuss their declarations in their annual appraisal or review and that professionals should be given information on how COIs can cause bias. There were mixed views about whether skilled professionals can avoid problems caused by conflicts, and whether professionals should be encouraged to avoid having COIs. However, there was agreement that patients should know about COIs in general, as well as their own doctors' specific conflicts.
3. The third set of statements explored the concerns associated with making DOIs: 'What concerns you most about making a declaration of interest?'.
   In general, participants expressed low levels of concern about making a declaration, including low concern about loss of personal trust, adverse publicity, loss of privacy and public scrutiny. The largest levels of concern were about lack of clarity on what should be declared, lack of enforcement for failures to declare and more bureaucracy. However, concern was also expressed about declarations feeding conspiracy theories and decreased trust in the professional in general.
4. Fourth, participants were asked about the most important aspects of a register of interests: 'If a single register was developed, it could be set up with the following features. How much do you agree with the following statements? A good declaration system should…. 0 is not at all, 10 is essential, using a sliding scale'.
   Respondents were most in agreement that a register should provide clarity on what information was needed; that it should be a centralised 'deposit' for all declarations; that it should be publicly accessible; and that it should educate and inform people accessing the register and professionals making declarations about their potential impacts. Having a lifelong personal identifier, some flexibility in declarations and some privacy features were also rated highly. The use of artificial intelligence to check and update declarations was far less popular.
5. Participants were also asked where acceptable sites would be to locate a register of interests. 57% said a new, independent organisation, 55% a professional regulator, 20% an academic organisation, 16% government and 7% a medical publishing organisation. 23% said 'somewhere else' and gave a free-text response. These responses were analysed together with free-text comments made at the end of the survey.

At the end of the survey, participants were asked for any other comments or clarifications. 32 respondents made comments. These were combined with 17 comments respondents had made in response to the other free-text question in this survey ('If a central register for declarations was developed, should it be held by…. please tell us all that you think would be acceptable') and thematically analysed. Six themes emerged: the potential for burden, organisation, scope, sanctions, non-financial conflicts and situation of a new register (online supplemental file 7).

11 participants mentioned the need to minimise the burden of declarations ('maximally streamlined and user friendly' (male, 45–54, academic)) or did not agree with the idea of a central register ('conflicts of interest change by time and circumstance. This is a bad idea' (male, 65–74, regulatory role)). Suggestions were made to link DOIs to other databases, such as ORCID. Nine cited the need for, and impact of, the knowledge of declarations, including reduced trust in professionals, and how to manage and respond to conflicts. Six responses concerned the correct scope of declarations—that they should be neither too wide nor too narrow. Two mentioned the need for non-financial conflicts to be addressed, and five cited the need for sanctions and/or the need to compel declarations to be open and honest.

DISCUSSION

This adapted Delphi process was composed of two surveys and one interview round between them, intended to describe the range of views held about the features of an ideal declaration system.

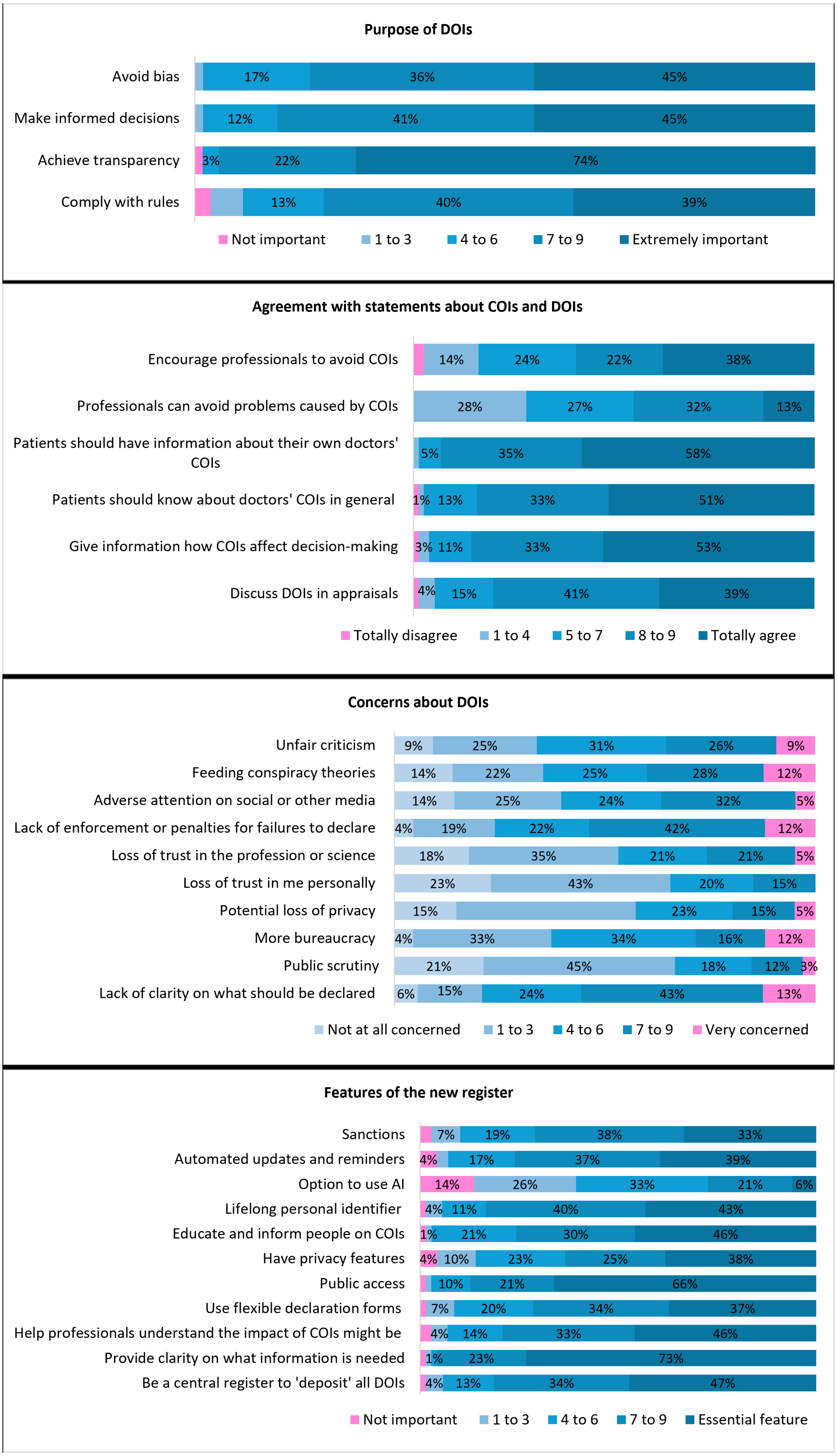

Figure 2 Responses to survey 2. AI, artificial intelligence; COIs, conflicts of interest; DOIs, declarations of interest.

The seven major themes identified were: regulation, the healthcare environment, human vices (known cognitive or other types of systematic human bias), professional virtues (aimed-for professional standards), judgements, the features of better systems and patients and the public.

These thematic findings generated the second survey, identifying features pertinent to an improved declaration system, either directly (eg, where a declaration system should be hosted, the need for clear instructions) or indirectly (cognitive biases, how to judge data or the motivations of those working with industry).

Survey 2 participants agreed strongly that declarations should be made to comply with rules and achieve transparency. There was a strong desire for clarity about what declarations should contain. Participants largely agreed that there should be a single repository for DOIs ('we should just do it once, do it well, it would save me time. It would save me hassle' Most participants were less concerned about public scrutiny, or loss of trust in them or the profession.

There were concerns that transparency may nurture conspiracy theories; that a lack of enforcement would limit the usefulness of declarations; and that unfair criticism and more bureaucracy would result. Smaller numbers had significant concerns about the potential for declarations to threaten personal security (eg, for people with unusual names or in particular specialities).

There were diverse views on where a centralised DOI register would sit, with several participants explicitly expressing a lack of trust in the UK medical regulator. Some respondents felt that regulators were at fault, either through ineffective or non-enforced regulation. Free-text comments contained concern for the increased workload for professionals, the lack of sanctions for non-compliant professionals and the difficulties of dealing with non-financial interests. Additionally, there were concerns that a new system still might not benefit patients.

Non-financial conflicts were also raised as difficult to declare and manage (eg, intellectual, professional rivalry, status seeking). While there is a large research output on financial COIs, there is less on how to measure or mitigate the others.[21] Participants described how human vices, such as ego, desire for power and limited insight, might affect the impact of declaration systems. Professional virtues such as the need to reduce or have skill in managing conflicts, or indeed in avoiding them were described as potentially overcoming these. Additionally, the impact of commercial priorities on healthcare systems, together with embedded cultures of commercial relationships, was a significant concern for some participants.

Crucially, there were profound disagreements between participants on whether healthcare professionals should work with industry, and whether COIs from working with industry can be safely managed in any circumstance. Individuals who felt it was an imperative to work with industry (to develop new products to benefit patients), and individuals who felt they should avoid working with industry (because they could become conflicted) felt they were acting ethically.

Weaknesses of this study include that the participants might be unusual and particularly engaged around this issue and not reflect the wider demographic of stakeholders. Despite our efforts to recruit a wide range of people, we could have missed dissenting views. Our sample was biased towards people from middle/older age, and younger people were less well represented. Our sample was dominantly UK-based and should not be assumed to represent views from other nations.

Strengths include the numbers of participants, the wide range of invitees, the high rate of participation in interviews and the second survey, and the diversity of opinions expressed. A further strength is the multidisciplinary research team, with expertise in medicine and different healthcare systems, sociology, management and philosophy; including a lay member from the Fife Community Advisory Council in the research processes. The design and results of this study were significantly enhanced by the team's collaborative reflexivity.[22] The team monitored responses and actively discussed and tried to recruit younger respondents who were under-represented. Organisations not actively engaged in the discussions around COIs and DOIs were specifically approached. Our discussions were carried by mutual responsibility for rigorous research, and conscious effort was made to incorporate different methodological viewpoints.

A previous narrative review of debates on COIs found two main discourses: a Critical Discourse (COIs are 'a major problem that should be addressed') versus a Defensive Discourse (efforts to control COIs are 'at best unnecessary and at worst harmful').[23] The authors concluded this discourse was entrenched, and 'unproductive and deeply confusing for the majority of medical professionals trying to work in an increasingly commercialized environment'.

This study also found varying views, with many reflecting this duality, but also with many subtleties. For example, participants with opposing views each cited ethical values as the reasons to either engage or not engage with industry. This is of particular note when considering future plans for addressing COIs in healthcare. Some participants described the ideal (no conflicts) versus the typical reality of professionals having many conflicts. For example, 'the scientists who work in industry….are motivated by wishing to achieve public good' versus 'It would be better…to have no conflict of interest'. Previous research has indicated that the motivations behind interactions with industry need to be understood; it is important to note that participants felt they were interacting ethically.[24]

Future work should reflect these findings while considering the problems with COIs in healthcare. Currently, a wide range of information is frequently requested from professionals about their interests.[7] This has a large implication for time, generating opportunity cost.[10] It would be possible to create an annually updated central depository which could receive this information, enable understanding of its potential implications (either for those depositing or retrieving information), offer privacy settings and the ability for relevant organisations to 'withdraw' data as relevant. This would require multiagency and professional acceptance, and testing to understand whether this is fit for purpose and/or generates counterproductive consequences.[25] Additionally, our findings suggest that the host and funder of such a model is important in terms of trust. It may be useful to reflect more widely on the economic positioning of declarations, which are generally done by professionals at the request of organisations who are free to set their own requests, whether or not this is efficient and reasonable. Considering current funding models, especially of medical journals, where peer review is freely given and barriers to access may persist, further costs on professionals may be poorly received. Additionally, any new system should increase efficiency for professionals rather than adding a further bureaucratic burden, which, given the current stresses on healthcare systems, would be arguably unethical.

Further research to understand the mitigations conflicted individuals take to manage conflicts, and their motivations, would help to ensure the effectiveness of a future system.[26] Equally, effective strategies for successful implementation, including framing the benefits of the system, require careful thought.

CONCLUSION

This study has mapped the views of key stakeholders regarding how DOIs should be made and the features that an improved system for managing COIs should have—identifying areas of agreement and disagreement.

An improved declaration system should be designed to achieve its end aim, that is, to remove the adverse impacts of COIs from decision-making in healthcare. Given the lack of evidence that declarations alone can achieve this, a centralised declaration platform should be viewed as only one part of a system fulfilling this overall aim. Reflecting the wider themes generated from this Delphi study, a better system should therefore help professionals and citizens consider the meanings, impacts and effects of conflicts, so they can be interpreted accurately and used effectively. Given the strong tendency for ethical values to be cited in arguments both for and against working with industry, it may be helpful to frame proposed changes in this way.

To ensure a new system can fulfil this aim, further research should examine positions of individuals with opposing perspectives, such as those who work extensively with industry and those who shun industry funding. An effective system for managing and declaring interests should be designed on the basis of evidence and with input from all stakeholder groups, including regulators, the Department of Health, researchers and professional and patient groups about what is acceptable and useful. Any intervention should be rigorously tested for evidence of benefit and harm before being widely adopted.

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Competing interests MM has written and broadcast about conflicts of interest in healthcare, and some of this has been paid journalism. All other authors have no competing interest to declare.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by School of Medicine University of St Andrews Research Ethics Committee, MD18094. Participants gave informed consent to participate in the study before taking part.

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