



BMJ Open Identification and comparison of key criteria of feedback of funding decisions: mixed-methods analysis of funder and applicant perspectives

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ABSTRACT

Objective This study investigated the content, quality and value of feedback given to applicants who applied to one of four research programmes in the UK funded (or jointly funded) by the National Institute for Health Research (NIHR).

Methods A mixed-method phased approach was conducted using document analysis and an online survey. Phase 1 examined 114 NIHR applicant feedback documents comprised written feedback from funding committees and external peer-reviewers and a conceptual framework of the key components of feedback was developed using content analysis. Phase 2 was an online survey completed by 113 NIHR applicants. Frequencies of responses to closed questions were calculated. Perceptions of quality and value of feedback were identified using content analysis of open-text responses.

Results In phase 1, a conceptual framework was developed with seven overarching categories: 'Study structure and quality'; 'Team and infrastructure'; 'Acceptability to patients and professionals'; 'Study justification and design'; 'Risks and contingencies'; 'Outputs'; 'Value for money'. A higher frequency of feedback was provided at stage 2 and for successful applications across the majority of components. In phase 2, frequency data showed that opinion on feedback was dependent on funding outcome. Content analysis revealed four main themes: 'Committee transparency'; 'Content validity and reliability'; 'Additional support'; Recognition of effort and constraints'.

Conclusions This study provides key insights and understanding into the quality, content and value of feedback provided to NIHR applicants. The study identified key areas for improvement that can arise in NIHR funding applications, as well as in the feedback given to applicants that are applicable to other funding organisations. These findings could be used to inform funding application guidance documents to help researchers strengthen their applications and used more widely by other funders to inform their feedback processes.

INTRODUCTION

Writing research applications and securing funding is an integral but competitive part of research. Throughout the research

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study directly examines funding committee feedback and converges findings from the funder and applicant perspectives.
- ⇒ Triangulating evidence from different sources (ie, funder feedback and applicant perception of feedback) reduces bias and ensures that all perspectives are considered and applicable to National Institute for Health Research (NIHR) and more widely to other funding organisations.
- ⇒ Although purposeful sampling identified a range in feedback documents across funding programmes and funding outcome (successful and unsuccessful), numbers were not equal for each.
- ⇒ The NIHR continually evaluates its practice, and since the feedback documents and applicants were identified from a 1-year period, some perspectives may not be representative of more recent changes to processes.

application lifecycle (from preparing an application to award decision), the burden falls on the applicant, the funding organisation and peer reviewers.^{1 2} It has even been suggested that the majority of burden falls disproportionately on the applicant, with estimates as high as 85% of the workload.²⁻⁶ For successful applicants, this is a necessary high cost-benefit to secure funding for their research, but for unsuccessful applicants, who make up about 75% of applicants,⁷ the associated effort far outweighs benefits.^{2 5 8} It is therefore important that funding organisations make the application process attractive and efficient for potential applicants.

One way funding organisations can do this is by providing applicants with the chance to receive feedback on their application.¹ Feedback in this context is defined as information provided to applicants about the outcome of the application with comments on strengths, issues and/or ways to improve the application

further. Feedback can provide the opportunity for applicants to improve the application by changing or justifying the content, as well as to help understand why the application was or was not successful.⁹⁻¹¹ From the funding organisation perspective, feedback can help to increase the transparency of decision-making processes and increase the quality of the applications that are submitted.⁹⁻¹² Consequently, it is essential that applicants receive constructive feedback that can be used as a learning opportunity to facilitate success.

Feedback practices vary widely between different funding organisations, research funding programmes and individual reviewers. Funding organisations often provide written feedback and/or scores which can range from a few bullet points to a longer narrative with in-depth information. For example, within the National Institute for Health Research (NIHR), the UK's largest funder of health and social care research, applicants receive written feedback from the funding committee (FC) for their stage 1 application. For stage 2 applications, applicants receive written feedback from external peer reviewers (EPR) (academic or clinical experts independent from the FC) and from the FC, for both successful and unsuccessful applications. Other mechanisms for feedback include rebuttals or follow-up telephone conversations (eg, see 9 10 12 13). The way in which feedback is perceived by the applicants is important as this may affect the funding organisations reputation and willingness of researchers to submit a funding application to these organisations in the future.¹²

Studies investigating perceptions of funding applications found that reviewers and committee members considered good applications to be clearly written, represent good science, describe an innovative and feasible research programme, have an experienced and committed principal investigator and is appropriately budgeted.^{9 14} By comparison, reviewers had less confidence in applications that were deemed vague with unfocussed project plans and poor writing styles.¹³ Other studies have found that variations in funding organisation's assessment criteria and reviewer practices (eg, amount of participation, level of motivation, criteria weightings) all contribute to differences in funding outcome.¹⁵⁻¹⁷ However, few studies have investigated the content, quality or value of feedback from a funding organisation and applicant perspective.

Therefore, this study aimed to investigate the content, quality and value of feedback given to applicants who applied to four NIHR research funding programmes using original feedback documents and responses to an online survey with applicants. As such this study aimed to directly converge sources of FC feedback from both the funder and applicant perspectives.

METHODS

There were two phases to this study: phase 1: document analysis of original feedback documents provided to applicants by NIHR FCs and EPRs across four NIHR

research funding programmes. Phase 2: a survey of NIHR applicants who previously applied to the programmes. Throughout the analysis, the researchers were mindful of their preconceptions about feedback to applicants, and there was more than one researcher coding the documents and reviewing categories and themes. As such, we are confident that this has minimised individual bias.

Patient and public involvement

No patients were directly involved in this study. However, the views of members of the public were sought as part of this study. A project advisory group was appointed to this project. The advisory group comprised six representatives from NIHR centres, NIHR Clinical Research Network and NIHR Research Design Service, researchers/applicants and two members of the public, known as public contributors, who have reviewed funding applications as EPRs and/or as part of the FCs.

Phase 1: document analysis

Document analysis is an efficient and effective method to directly review and interpret original documentation from a wide breadth of rich sources to gain key information and insights on the context and depth of the data provided.¹⁸ An iterative systematic process was adopted to develop a conceptual framework of the key categories (referred to as components) of feedback.¹⁸⁻²²

Data

The documents included applicant feedback documents from four funding programmes: NIHR Health Technology Assessment (HTA), Medical Research Council-NIHR Efficacy and Mechanism Evaluation (EME), NIHR Health Services and Delivery Research (HSDR) and NIHR Public Health Research (PHR) between March 2018 and March 2019. For HTA, feedback documents comprised of written feedback from stage 1 and stage 2 FCs and EPRs. These were used to create the initial framework. For the remaining programmes, feedback documents comprised of written feedback from stage 2 FCs only. Purposeful sampling was used to identify the feedback documents within the timeframe from a range of applications across programmes, work stream (researcher-led (any topic) or commissioned (a specific research call)) and outcome (fund with changes (hereafter termed successful) and unsuccessful). Due to constraints in the number of external peer reviews and applications submitted within the timeframe, the distribution of feedback documents differed across applications and programmes (online supplemental appendix 1 for distribution). A total of 114 feedback documents were reviewed and interpreted. The depth of information varied across feedback documents. In general, stage 1 and stage 2 committee feedback is written in short bullet-pointed sentences, while the EPRs' feedback is written in paragraphs within five sections of the reviewer form. All feedback documents (linked-anonymised) were imported into NVivo V.12 data management programme.²³ Example

quotes have been given identifiers that reflect the stage (stg1, stg2), outcome (successful=S, unsuccessful=U), who provided feedback (FC or EPR) and the participant identifier.

Analysis plan

The steps to document analysis are outlined below.^{18 19} Data analysis was guided by the methodological framework for conventional content analysis which aims to uncover themes pertinent to the phenomenon of interest without imposing any pre-existing categories or theories.^{20–22}

Step 1: identification of potential categories and the development of initial conceptual framework

An initial framework was developed using a subset of HTA data (n=20). First, two authors (KF, KM) independently analysed the dataset. This involved data familiarisation and immersion (reading/rereading), developing meaningful units (codes) and noting any potential categories. Meaningful codes comprised words, parts of sentences, full sentences and/or full paragraphs that relate to the same topic, in content and context and were felt to capture key thoughts or concepts in the data.²² The two authors then met to examine and discuss the initial codes and sort into potential categories. Any disagreements regarding the codes were discussed until consensus was reached. Through these discussions, similar codes were aggregated into broad over-arching categories, and first-order and second-order components that represented the common themes arising from the initial coding. This proposed framework was iteratively refined with the remaining HTA data.

Step 2: applying and refining the proposed framework

The proposed conceptual framework was then applied to the stage 2 feedback documents from EME, HSDR and PHR programmes. Analysis of these documents was guided, but were not confined, by the framework. This allowed for the emergence of new codes or for existing categories to be expanded based on the new dataset. Two authors (KF, KM) independently applied the framework to the dataset. This was an iterative process in which the authors initially familiarised themselves with the data, and then assigned the coded text to a relevant overarching category and first/second-order component or created a new first/second-order component.

Step 3: review and finalisation of the framework

The conceptual framework, extracted codes and codes removed for being ambiguous were reviewed and discussed with all authors. Each category was discussed in turn with further refinements made through an iterative process until the categories were finalised and consensus was reached on the final framework.

Step 4: identifying patterns in the data

The final step was to identify and examine the patterns in the feedback (codes) for each component between the different data sources. With respect to our specific

research questions, we examined the similarities and differences in the frequency of coding and the detail and tone of feedback between stages and outcome, initially focusing on the committee feedback before incorporating EPR feedback. This removed potential bias that could have arisen from the differences in the number and length of feedback documents between EPRs feedback (written in longer narratives) and committee meeting feedback (written in short bullet-pointed sentences).

Phase 2: survey to applicants

An online survey was designed to gather quantitative and qualitative information about applicant perceptions of feedback from the same four funding programmes as phase 1 (HTA, EME, HSDR, PHR).

Survey

The survey was delivered online using iSurvey software (<https://isurvey.soton.ac.uk/>). The survey was developed and refined in consultation with NIHR FC secretariat. The final survey consisted of 36 closed and free-text questions (online supplemental appendix 2). Respondents were asked to complete the survey based on one research application and only answer questions relevant to the outcome decision of that application (eg, respondents unsuccessful at stage 1 did not answer questions about stage 2 feedback).

Recruitment

Purposive and snowball sampling was used to recruit a broad range of respondents by funding programme, work stream and outcome. The research team sent the survey invitation email to 770 applicants who submitted an application to one of these programmes between March 2018 and March 2019. Respondents either accessed the survey via the link in the invitation email or via a link on Twitter. The survey was open for 3 weeks in October 2019. A reminder email was sent out 1 week before the survey was due to close.

Data analysis

A mixed-methods approach was applied to the analysis of the survey data. Quantitative data were imported to Microsoft Excel 2016. Exclusion criteria included any respondents that did not complete the full survey (we were unable to guarantee that these respondents did not return to complete the survey at a later time), or whose applications did not reach stage 1 or were awaiting feedback from stage 1. Descriptive statistics were used to identify frequencies and percentages of responses to closed questions in relation how much an applicant agreed or disagreed with a statement about the feedback. The open-text data for qualitative analysis were imported into NVivo V.12 data management programme.²³ Free text responses were subjected to the same conventional content analysis as described in phase 1.

RESULTS

Phase 1: document analysis

Conceptual framework of the key components of feedback

Following the steps outlined above, 1438 meaningful codes were identified and a conceptual framework was developed and refined (table 1). The framework incorporates seven overarching categories, 16 first-order and the associated 18 second-order key components that were felt to capture all the content as described in the raw document data. All the components included comments that were encouraging and positively toned as well as negatively toned comments such as highlighting problems or lack of detail.

The most frequently reported overarching categories were ‘Study justification and design’ (676 codes), ‘Risks and contingencies’ (283 codes) and ‘Teams and network support infrastructure’ (130 codes), while ‘Value for money and costings’ had the fewest codes (82 codes). ‘Study justification and design’ encompasses five first-order components, of which, comments on ‘justification of design and methodology’ were most frequently reported to applicants (table 1). Within this component, there were both broad and specific comments on study design and methodology. For example, the ‘general design and methodology procedures’ component included comments such as ‘The funding committee was not convinced by the proposed trial methodology’ (Stg2-U-FC14), while the ‘data collection’ component included specific comments on ‘how data collection will be managed’ (Stg1-S-FC9), on process evaluations being ‘underspecified’ (Stg2-U-FC3) and on qualitative research being ‘an afterthought’ (Stg2-U-EPR22-5) or ‘not fully integrated’ (Stg2-S-EPR15-3) (see online supplemental appendix 3 for further examples).

The ‘Risks and contingencies’ overarching category encompasses two first-order components; ‘risk to research participants’ and ‘risk to research itself’. Of these, comments on ‘challenges to recruitment, retention and attrition’ were most frequently reported to applicants, with comments on the strengths of the recruitment and retention strategies, for example ‘it is a strength that patients will be recruited from several centres’ (Stg2-S-EPR7-2), and concerns regarding ‘adherence’ (Stg2-S-FC50), ‘limiting the research setting’ (Stg1-S-FC21) and being ‘optimistic [about] recruitment and retention rates’ (Stg2-S-EPR12-3).

The ‘Teams and infrastructure’ overarching category included concerns about the number of co-applicants, ‘the small time allocated for the co-applicants’ (Stg1-S-FC12), and the lack of ‘clear justification of each individual role’ (Stg2-S-FC27). Positive comments about the research teams experience were also reported, for example, ‘a team with a track record of delivering similar studies and have clinical, statistical and methodological expertise to successfully complete the proposed study’ (Stg2-S-FC42).

The remaining components reflected comments on the quality and clarity of writing (‘Study structure and quality’), the potential clinical impact and dissemination

plans (‘Outputs’), the justification of costings and in relation to this whether the study was considered good value for money (‘Value for money and costings’) and the acceptability of the project from the perspective of both patients and professionals and clarifying the patient involvement in the project (‘Acceptability to patients and professionals’). For example, ‘would have required further PPI work to assess the feasibility of this study in terms of placing additional burden on this vulnerable patient group’ (Stg2-U-FC56).

Patterns in the framework components between HTA application stages

The frequency and detail of feedback was variable across the two stages for a number of components (see table 1 and online supplemental appendix 3). First, feedback on ‘patient co-applicants’ was only provided by EPRs, while feedback on the ‘quality and clarity of writing’, ‘meeting the brief’, ‘Clinical Trials Unit (CTU) involvement’, ‘data procedures and management’ and ‘safety concerns’ was only provided at stage 1 and by EPRs only (online supplemental appendix 3). Second, in general, there was higher frequency of feedback at stage 2 than stage 1, most notably in the ‘justification of design and methodology’ second-order components and the ‘pathway to impact’ component. For the ‘justification to design and methodology’ components, there was a slight trend towards the feedback at stage 1 asking for detail and justification of methods (eg, ‘[...] provide sufficient detail of the planned statistical modelling [...]’. (Stg1-S-FC9—‘data analysis’), while the committee feedback at stage 2 was more directive and tended to just focus on clarification of existing methods (eg, ‘A process evaluation is not required; an evaluation of recruitment and optimisation would be appropriate’ (Stg 2-S-FC25—‘data collection’)). The feedback for ‘pathway to impact’, in contrast, was less directive and tended to raise concerns about the benefit (eg, ‘There is little reference to any impact of the research—what would that be and who would be the beneficiaries of this research? [...]’ (Stg2-U-EPR21-2)) and generalisability of the study into practice. For example, ‘It is a little unclear that the results of this trial would meaningfully inform clinical practice’ (Stg2-S-EPR19-3).

Third, for components that had a higher frequency of feedback at stage 1, there was a slight trend towards the feedback being more directive than that provided at stage 2 (committee). For example, at stage 1 the ‘defining outcomes’ component included comments such as ‘consider how they will assess xxxx as an outcome’ (Stg1-S-FC15), whereas at stage 2, the feedback raised concerns about the outcomes and endpoints (eg, ‘[...] consider collecting longer term follow up data’ (Stg2-S-FC10)). Finally, for ‘Risks and contingencies’, the feedback at both stages raised concerns about recruitment strategies and progression criteria, asking for justification, clarification and more detail (online supplemental appendix 3).

Table 1 The conceptual framework of the key components of feedback with descriptions and example codes

| Overarching category First-order component Description of component | Second-order component Description of component | Example quotes | No: Stg1 | | | No: EPR | | | No: Stg2 | | | | |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---|---|---------|----|----|----------|---|---|--|--|
| | | | No | S | U | S | U | S | U | S | U | | |
| <i>Study structure and quality</i> | | | 92 | | | | | | | | | | |
| Quality and clarity of writing Clarity of information and writing | | 'The application should have been more clearly written'. Stg1-U-FC5 | 24 | 1 | 2 | 5 | 8 | 5 | 5 | 3 | | | |
| Meeting the brief Confirming or deviating from the brief | | 'It is very clear that the applicants have thought carefully about all aspects of the application. All points in the brief have been answered'. Stg2-U-EPR8-1 | 11 | 0 | 2 | 4 | 5 | 0 | 0 | 0 | | | |
| Plain English summary Clarifying summary and reducing terminology | | 'The plain English summary described the research well'. Stg2-U-FC37 | 29 | 0 | 0 | 9 | 10 | 6 | 4 | | | | |
| Response to stg 1 feedback comments Clarity of responses and application changes | | 'The Committee noted that the team had responded well to the majority of committee and reviewer feedback'. Stg2-S-FC30 | 28 | 0 | 0 | 9 | 10 | 9 | 9 | | | | |
| <i>Team and network support infrastructure</i> | | | 130 | | | | | | | | | | |
| Justification of role and team PI and coapplicant roles in project, incl. expertise and time allocated (% FTE) | | 'The number of applicants was considered too high and without a clear justification of each individual's role. Reductions should be made'. Stg2-S-FC27 | 110 | 6 | 1 | 38 | 35 | 20 | 10 | | | | |
| Patient coapplicant PPI coapplicant's role in the application and on the project. | | 'PPI is very good and I am impressed that a lay person who has direct experience in this area has been made a co applicant. This will really ensure that the Patient is at the forefront of the research'. Stg2-U-EPR8-1-U | 12 | 0 | 0 | 4 | 3 | 3 | 2 | | | | |
| CTU involvement Justification of or need for CTU involvement. | | 'The degree of involvement and role of the CTU should be clarified'. Stg1-S-FC12 | 8 | 1 | 0 | 4 | 0 | 2 | 1 | | | | |
| <i>Acceptability to patients and professionals</i> | | | 86 | | | | | | | | | | |
| Patient and public involvement (PPI) Clarifying PPI in question development, project design and management | | Considerable thought has been given to bringing together a broad range of stakeholders and ensuring that there is genuine co-production in the development of the research'. Stg2-U-EPR14-2 | 86 | 4 | 1 | 30 | 24 | 14 | 13 | | | | |
| <i>Study justification and design</i> | | | 676 | | | | | | | | | | |
| Scientific rationale and clinical relevance Clarifying/justifying scientific rationale and clinical relevance | | 'The Funding Committee was not convinced that the applicants had taken sufficient account of existing evidence in this area [...]'. Stg2-U-FC21 | 100 | 4 | 0 | 37 | 38 | 4 | 17 | | | | |

Continued

Table 1 Continued

| Overarching category First-order component <i>Description of component</i> | Second-order component <i>Description of component</i> | Example quotes | No. Stg1 | | | No. EPR | | | No. Stg2 | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|---|---------|----|----|----------|----|---|
| | | | No | S | U | S | U | S | U | S | U |
| Justification of design and methodology Overall study design procedures and methodology | General design and methodology procedures Clarifying/adjusting design | 'The Funding Committee was not convinced by the proposed trial methodology in the submission'. Stg2-U-FC14 | 61 | 2 | 2 | 17 | 14 | 13 | 13 | 13 | |
| | Data collection Clarifying/justifying collection methods incl. qualitative and process evaluation | 'The applicants should reassure the Funding Committee about data completeness'. Stg1-S-FC9 | 73 | 6 | 0 | 24 | 12 | 12 | 12 | 19 | |
| | Defining intervention procedure Clarifying/justifying intervention and procedures | 'The applicants need to clearly define the intervention and ensure that it does not change as a result of the qualitative research'. Stg2-S-FC12 | 46 | 2 | 1 | 9 | 20 | 10 | 10 | 4 | |
| | Defining research trial arms Clarifying/justifying trial arms incl. control group | 'The Committee was unconvinced by the justification given, for the lack of any control arm'. Stg1-U-FC2 | 27 | 3 | 2 | 6 | 6 | 6 | 6 | 4 | |
| | Blinding and randomisation Clarifying/justifying randomisation/blinding procedures | 'Lack of details around blinding: [...] would have liked to see more detail as to who/how blinding will be implemented'. Stg2-S-EPR12-2 | 30 | 1 | 1 | 10 | 10 | 6 | 6 | 2 | |
| Justification of sample size and characteristics Clarifying and justifying target sample | Inclusion and exclusion Clarifying/justifying criteria for inclusion incl. sample characteristics | 'Justification should be provided for why females have been excluded from the study population'. Stg2-S-FC32 | 64 | 2 | 0 | 13 | 34 | 5 | 5 | 10 | |
| | Sample size calculation and power Justifying target sample sizes and reliability of calculations | 'There is considerable uncertainty in the estimates used for the sample size calculation, however the sample size does seem reasonable in terms of the standardised difference'. Stg2-S-EPR11-2 | 51 | 3 | 0 | 14 | 12 | 17 | 17 | 5 | |
| Data analysis Clarifying and justifying data analysis plans | Statistical analysis plan Clarifying/adjusting statistical analysis plan, incl. handling confounders and missing data | 'Would have required further justification for the statistical analysis plan, which was not deemed appropriate in its original form'. Stg2-U-FC56 | 71 | 3 | 0 | 14 | 19 | 26 | 26 | 9 | |
| | Cost-effectiveness and QALYs Specification of health economics components and procedures | 'The applicants should provide more detailed specification of the health economics with justification of questionnaires to be used'. Stg2-S-FC10 | 46 | 3 | 0 | 13 | 13 | 8 | 8 | 9 | |
| Defining outcomes Clarifying and justifying primary/secondary outcomes, incl. aligning with clinical outcomes and the measurement tools | | 'The Committee was unconvinced by the choice and timing of the primary outcome measure, [...] consider changing it to one that it is meaningful to patients and relevant to clinicians to change practice'. Stg1-S-FC6 | 107 | 11 | 2 | 23 | 47 | 12 | 12 | 12 | |
| | <i>Risk and contingencies</i> | | 283 | | | | | | | | |
| Risk to research participants Risks to participants and ensuring contingencies for safety, well-being and rights of participants | Clarifying consent Consent procedures queries, ensuring patients know all information and their rights | 'The applicants will need to provide more details and justification on the consent process'. Stg1-S-FC10 | 27 | 1 | 0 | 7 | 12 | 6 | 6 | 1 | |
| | Safety concerns Justifying safety procedures and ensuring that they are in place | 'The applicants should more clearly specify the collection of safety and side-effect data'. Stg1-S-FC7 | 24 | 3 | 1 | 2 | 11 | 6 | 6 | 1 | |

Continued

Table 1 Continued

| Overarching category First-order component Description of component | Second-order component Description of component | Example quotes | No | | | No: Stg1 | | | No: EPR | | | No: Stg2 | | |
|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|---|----------|----|----|---------|---|---|----------|---|--|
| | | | No | S | U | S | U | S | U | S | U | S | U | |
| Risk to research itself Risks to completion of the study and validity of results and contingencies | Research data procedures and management Ensuring data procedures align with ethical management | '[...] it is not clear what the process or protocol will be for monitoring this over the course of the data collection period [...]'. Stg2-S-EPR15-1 | 32 | 1 | 0 | 14 | 11 | 4 | 2 | | | | | |
| | Challenges with recruitment, retention and attrition Procedures and contingencies for recruitment, monitoring retention and attrition | 'The committee had concerns about the feasibility of recruitment and high non-engagement rates. The proposed changes [...] to the main study were not adequately justified or piloted [...]'. Stg2-U-FC34 | 86 | 6 | 1 | 28 | 31 | 11 | 9 | | | | | |
| | Stop and go criteria Specification of progression criteria, incl. pilot studies feedback | 'The applicants need to clarify how the multiple rules in the progression criteria in the internal pilot will be used'. Stg2-S-FC10 | 27 | 3 | 0 | 3 | 8 | 10 | 3 | | | | | |
| | Bias Transparency of potential conflicts of interest/bias in the team, industry partners and in project outcomes | 'The applicants should justify their dissemination plans and consider the inclusion of service users'. Stg2-S-FC9 | 32 | 5 | 0 | 6 | 10 | 4 | 7 | | | | | |
| | Feasibility Whether the project is feasible and deliverable | 'The large number of conditions included was noted and raised concerns as to the ability to deliver the trial covering all of these'. Stg1-U-FC13 | 55 | 2 | 3 | 15 | 22 | 2 | 11 | | | | | |
| | Outputs | | 89 | | | | | | | | | | | |
| | Clarify dissemination Clarifying and justifying dissemination plans, ensuring generalisable to all audiences | 'It might be useful to have included a dissemination plan that was transparent and clear for the reviewers to assess. [...] there is some merit in sharing interim findings [...]'. Stg2-U-EPR21-2 | 21 | 1 | 0 | 8 | 3 | 6 | 3 | | | | | |
| | Pathway to impact and implementation Clarifying and justifying implementation plans, incl. how it will lead to clinical impact | 'The Committee was unconvinced that this proposal would change practice, especially given the unconvincing approach to handling potential biases inherent in the design'. Stg2-U-FC20 | 68 | 1 | 0 | 18 | 20 | 15 | 14 | | | | | |
| | <i>Value for money and costings</i> | | 82 | | | | | | | | | | | |
| | Justifying costs and value for money Costings and whether it is considered good value for money | 'The proposed study was considered very expensive and did not represent good value for money'. Stg1-U-FC1 | 82 | 3 | 4 | 22 | 21 | 20 | 12 | | | | | |

Quotes are written verbatim. Application outcomes are provided for context for the quotes.

CTU, Clinical Trials Unit; EPR, external peer reviewer; FC, funding committee; FTE, full time equivalent; QALYs, quality-adjusted life years; S, successful; Stg1, stage 1 application; Stg2, stage 2 application; U, unsuccessful.

Patterns in the framework components between application outcomes (successful vs unsuccessful)

In general, there was a higher frequency of feedback given for successful applications than unsuccessful across the majority of components (table 1). However, there were a few exceptions in which the pattern was reversed. For example, the 'scientific rationale and clinical relevance', 'feasibility', 'bias', 'inclusion and exclusion' and 'data collection' second-order components had a higher frequency of feedback for unsuccessful applications. For these components, the majority of the feedback for unsuccessful applications focused on needing more justification and detail, and concerns about problems being overlooked or projects being deliverable (eg, 'potential bias not being considered' (Stg2-U-FC25) or the projects being 'too ambitious and overly complicated' (Stg2-U-FC47)), while the feedback for successful applications in general focused on needing more reassurance and making clearer links to other works (online supplemental appendix 3).

In contrast to the above pattern towards successful applications, the pattern in the tone of feedback was similar across successful and unsuccessful applications. For example, both positively toned comments about the team being 'strong' and having the 'breadth of relevant expertise' (Stg2-U-FC39) and negatively toned comments about justifying roles within the team, or lack of key supporting roles were observed across outcome. For example, '[...] there appears to very little social work expertise in the team. The applicants need to address this in the composition of the team' (Stg2-S-FC45). Therefore, in this case, this suggests that the tone of the feedback on the team was not an indicator of outcome. However, there were some exceptions. For example, it was noted that the feedback in the 'Challenges with recruitment, retention and attrition' component was in general more negatively toned across both successful and unsuccessful applications (online supplemental appendix 3).

For some components, the feedback was less detailed and directive for unsuccessful applications than successful. For example, the feedback for unsuccessful applications in 'Value for money' component was generally a short sentence about the lack of justification of costs and/or that 'the study proposed did not represent good value for money' (Stg2-U-FC34; FC22). In contrast, the feedback for successful applications was slightly more directive and detailed, asking for clarification and adjustments to costs (generally reductions), including changing study design and/or role allocation without increasing the costs. For example, '[...] a greater proportion of the CI's time should be committed to the project (at least 15%), but the Funding Committee does not expect to see an increase in costs' (Stg2-S-FC46). The feedback for unsuccessful applications in 'pathway to impact' component suggested that the committees were unconvinced of impact and external validity of the results (eg, 'It was unclear how the study would unpick which elements of the intervention were impactful' (Stg2-U-FC26)). While

for successful applications the feedback was directive asking for reassurance on the sustainability of the interventions and consideration to potential ways to assure impact ('Requires further detail on how the [xxxx] will be applied to future research and clinical care; and the pathway to impact' (Stg2-S-FC56)).

Phase 2: survey to applicants

Sample demographics

One hundred and forty-seven applicants completed the survey (giving a response rate of 19%). Of these, 34 respondents were excluded from the analysis for the following reasons: responses for feedback that was not provided by an NIHR research programme (n=1), applications that did not reach stage 1 (n=2), applications that were awaiting feedback from stage 1 (n=2) and incomplete responses (n=29). The remaining responses from 113 respondents were analysed. These responses represented successful and unsuccessful applications from four NIHR research programmes (see online supplemental appendix 4 for distribution). Five respondents were awaiting final decisions and for ten respondents the final outcome was unknown. Out of the remaining 98 respondents, there were more responses from applicants who had been unsuccessful (n=67) than successful (n=31). Of those who had been unsuccessful, more had been unsuccessful at stage 1 (n=43) than stage 2 (n=24).

Qualitative data

From the open-ended responses, four main themes, with 12 associated subthemes were extracted (table 2). Similar to the document analysis in phase 1, comments from respondents reflected positive and negative opinions or suggestions for improvement. In some cases, respondents recognised that their opinions of the feedback were potentially influenced by their disappointment with an unsuccessful decision outcome and this is confirmed in the quantitative data later.

'Committee transparency' was the most frequently reported theme (178 codes). Despite findings from phase 1 showing that the committees often requested more details and justification for the different components, respondents indicated that these requests were not sufficiently clear and that the feedback was at times 'vague', 'lacked detail' and 'depth'. For example, 'The details were very limited and its interpretation was unclear' (Stg2-U-P58). Respondents reflected that FCs should be 'constructive' and give 'a clearer steer' or 'sense of what is expected', as 'it was hard to know what changes the panel really wanted' (Stg2-S-P84). This was specifically mentioned in relation to feedback on study design (eg, 'But it did not give any examples of a design that would have been superior to ours' (Stg2-U-P47)) and reducing study costs for stage 2 applications (eg, 'The stage 2 application should be submitted with a significant reduction in costs. No indication of the expected cost range'. (Stg2-S-P80)). We also observed in phase 1 that feedback on

Table 2 Thematic framework for perceptions of committee feedback

| Theme Subtheme with description | Example quotes | No: total | No: Stg 1 | No: Stg 1 | No: general |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|----------------|
| <i>Theme 1: Committee transparency</i> | | 178 | | | |
| Clear expectations and constructive comments The content and tone of the feedback (not including strengths) | '[...] on the whole the feedback was helpful in that it was constructive'. (Stg2-U-P45) | 132 | 86 | 39 | 7 |
| Justification of decisions, comments and requirements The need for feedback to provide some understanding of the reasoning behind decisions or suggestions for change | 'More of a sense of the thinking of the committee behind the decisions'. (Stg1-U-P13) | 34 | 19 | 11 | 4 |
| Realistic decisions The need for the committee to give clearer guidance on what they are interested in and will realistically fund | 'In this case, by recognising that the project on offer was not what the board wanted to fund, and rejecting it rather than shortlisting'. (Stg2-U-P57) | 12 | 6 | 5 | 1 |
| <i>Theme 2: Content validity and reliability</i> | | 123 | | | |
| Consistency of comments throughout the process Inconsistencies in the feedback given across boards and/or peer reviewers | 'Several aspects either contradicted Stage 1 feedback (examples—Stage 1 advised increasing CI time, Stage 2 questioned why), or repeated Stage 1 feedback (asking for additional clinical justification for the study after we had already provided this; or repeating questions regarding the statistics)'. (Stg2-S-P71) | 59 | 30 | 26 | 3 |
| Accuracy and relevance of comments Inaccurate, misunderstood or irrelevant feedback comments. | 'The issues raised were subjective and in some cases incorrect'. (Stg2-U-P44) | 38 | 26 | 9 | 3 |
| Expert reviewers Reviewers needing to be experts or have an understanding the topic, or reference to conflict of interest | 'Reviewers, whenever possible, being familiar with the type of study and theoretical base being proposed'. (Stg2-U-P64) | 26 | 19 | 4 | 3 |
| <i>Theme 3: Additional support for applicants</i> | | 71 | | | |
| Additional advice from committees The need for additional advice provided by the committee or wanted from applicants | 'Advice on alternative funders or NIHR schemes would be hugely beneficial given the vast amount of time each application takes to produce'. (Stg1-U-P12) | 12 | 8 | 4 | 0 |
| Alternative mechanisms for providing feedback The need for alternative/additional mechanism(s) for getting feedback/support, and or interacting with funder | 'The opportunity for a phone-follow-up was extremely useful and should in any case be kept as an integral part to clarify and interpret the panel feedback. It has without doubt helped us better understand the priorities and the key concerns expressed by the panel, putting them into context and allowing us to focus on these areas'. (Stg2-Awaiting- P104) | 59 | 32 | 12 | 15 |
| <i>Theme 4: Recognition of effort and constraints</i> | | 68 | | | |
| Applicant effort Applications being burdensome to applicants | 'The lack of recognition of the work that had gone into the bid'. (Stg1-U-P22) | 11 | 6 | 2 | 3 |
| Length of feedback The amount of feedback provided (not related to detail) | 'The length and detail were entirely appropriate'. (Stg2-S-P84) | 24 | 14 | 5 | 5 |
| Word limitations in application The word counts of the application limiting the amount of detail provided | 'The stage 1 feedback mainly identified that the limited space for stage 1 applications means that adequate detail cannot be entered. The comments all requested additional detail. The feedback did not identify the critical issues that were identified at panel review that led to rejection'. (Stg2-U-P50) | 17 | 16 | 1 | 0 |
| Strengths of the application Feedback on the strengths of the proposal | 'Additional detail and some positive feedback would be helpful in places'. (Stg2-S-P100) | 16 | 11 | 1 | 4 |
| Quotes are written verbatim. Research programme and application outcome are provided for context for the quotes. Stg1=comments made in section 3 of the survey about stage 1; Stg2=comments made in section 4 about stage 2; General=comments made in section 5 of the survey. S, successful; Stg1, stage 1 application; Stg2, stage 2 application; U, unsuccessful. | | | | | |

'value for money' were short sentences that were not always directive or detailed.

The 'Committee transparency' theme also incorporated comments on the need for more 'justification' or 'rationale' to 'understand reasoning' behind change requests or decisions. For example, 'Avoidance of sweeping statements made without rationale or justification'

(Stg1-U-P39). Applicants also suggested that committees should be more realistic about which proposals are likely to be funded, showing a preference for 'rejecting it rather than shortlisting' (Stg2-U-P57), removing applications at stage 1 that the committee were unsure about.

In the second largest theme, 'Validity and reliability of feedback', applicants identified the need for consistency,

accuracy and relevance of comments. For example, ‘First, several aspects either contradicted Stage 1 feedback [...], or repeated Stage 1 feedback [...]’ (Stg2-S-P71) and ‘[feedback should be] More accurately linked to what had been in the proposal’ (PHR-Stg1-U-P42). This reflects the findings from phase 1 that showed differences in the amount of detail and frequency of feedback provided between stage 1 and stage 2, and indicates that these differences may have been seen by applicants as inconsistencies in places.

The importance of having the right expertise at committee meetings was also acknowledged, with respondents commenting that ‘having an expert reviewer might help to make the feedback more constructive as otherwise it is quite generic’ (Stg1-U-P25). Applicants reflected on additional advice that was or could be given by committees, such as ‘The final phrase of this bullet was more useful and suggested that we consider a programme grant as the panel thought there was a large volume of work to do’ (Stg1-U-P32). This was seen as supportive and helpful. Applicants also suggested additional elements to enhance feedback, such as feedback on what was funded (eg, the scores or design details of what was funded) in order to be able to compare how it differed from their own application or ‘indicating weightings’ of feedback points as to whether changes are essential or advisory. For example, ‘It would help if the essential/mandatory changes were clearer, and differentiated from those that should be considered and are not mandatory’ (Stg2-S-P81). Additionally, respondents suggested that ‘It would have been

good to have had some mechanism whereby feedback could be discussed/explained further’ (Stg1-U-P9).

‘Recognition of effort and constraints’ theme reflected frustrations at the length and lack of detail of the feedback received, especially in relation to the effort writing application forms can take, for example, ‘It was very short for the length of the application’ (Stg2-U-P50). In phase 1, we observed that committee feedback often asks for more detail and justification for the different feedback components. This aligns with respondents’ frustration with the word limitations and the feedback requesting more detail. Applicants felt that there needed to be an ‘Appreciation of the lack of space available within the Stage 1 application’ (Stg1-U-P39). In addition, despite both phases demonstrating that both positively and negatively toned comments were provided to applicants, it was felt that some more ‘commentary regarding strengths’ (Stg2-S-P76) would be useful and welcomed too.

Quantitative data

For data analysis purposes, agree and somewhat agree responses were combined into one overall agree score and disagree and somewhat disagree responses were combined into one overall disagree score. Table 3 shows the distribution of responses across the perception of feedback statements. Overall opinion for feedback was mixed, with approximately 50% of the respondents agreeing and disagreeing with the statements. However, opinion on feedback was found to depend on the outcome, with those who were successful being more likely to agree with

Table 3 Perceptions of feedback as a function of application decision

| | Overall perceptions | | | | | Stage 1 feedback | Stage 2 feedback |
|-----------------------------|---------------------|--------------|----------|----------|---------------------|------------------|------------------|
| | Useful | Good quality | Value | Benefit | Helpful development | Useful | Useful |
| Overall | | | | | | | |
| Combined agree | 60 (54%) | 53 (47%) | 56 (50%) | 60 (54%) | 49 (44%) | – | – |
| Combined disagree | 52 (46%) | 60 (53%) | 57 (50%) | 52 (46%) | 63 (56%) | – | – |
| n | 112 | 113 | 113 | 112 | 112 | – | – |
| Unsuccessful stage 1 | | | | | | | |
| Combined agree | 15 (35%) | 10 (23%) | 13 (30%) | 19 (45%) | 14 (33%) | 12 (30%) | – |
| Combined disagree | 28 (65%) | 33 (77%) | 30 (70%) | 23 (55%) | 29 (67%) | 28 (70%) | – |
| n | 43 | 43 | 43 | 42 | 43 | 40 | – |
| Unsuccessful stage 2 | | | | | | | |
| Combined agree | 9 (37.5%) | 10 (42%) | 6 (25%) | 7 (29%) | 4 (17%) | 10 (53%) | 3 (15%) |
| Combined disagree | 15 (62.5%) | 14 (58%) | 18 (75%) | 17 (71%) | 20 (83%) | 9 (47%) | 17 (85%) |
| n | 24 | 24 | 24 | 24 | 24 | 19 | 20 |
| Successful | | | | | | | |
| Combined agree | 27 (90%) | 26 (84%) | 28 (90%) | 26 (84%) | 24 (80%) | 24 (92%) | 26 (90%) |
| Combined disagree | 3 (10%) | 5 (16%) | 3 (10%) | 5 (16%) | 6 (20%) | 2 (8%) | 3 (10%) |
| N | 30 | 31 | 31 | 31 | 30 | 26 | 29 |

Blank cells (–)=no responses due to question not being relevant to applicants due to final decision.

the statements and those who were unsuccessful were more likely to disagree with the statements. Feedback at the point of rejection was more likely to receive disagree statements (see last two columns in [table 3](#)).

Over 90% of respondents who were successful agreed with the statements that stage 1 and stage 2 feedback was useful, while only 30% of respondents who were unsuccessful at stage 1 agreed with the statement that the 'stage 1 feedback was useful'. In contrast, while only 15% of respondents who were unsuccessful at stage 2 agreed that 'the stage 2 feedback was useful', opinion was more mixed for the feedback given at stage 1, with 53% of respondents agreeing that stage 1 feedback was useful. This is in direct contrast to the findings from phase 1, in which there were no clear differences in feedback between successful and unsuccessful applicants.

DISCUSSION

This study gained key insights and understanding into the quality, content, and value of feedback given to applicants who have applied to four NIHR research programmes. Through content analysis of feedback documents and our online survey, we have identified the key components of feedback and how applicants view the feedback provided and highlight elements in feedback that could help improve the content, quality and value of feedback and in turn enhance an application and reduce applicant burden in terms of time and effort.

Key components of feedback

Through our document analysis, we have built a framework that has allowed us to provide fine-grained information on the type of feedback given within each of the overarching categories. This framework therefore can provide clear evidence and guidance on the type of feedback given and on the components of feedback which are most often reported to applicants. 'Study justification and design', 'Risks and contingencies' and 'Teams and network support infrastructure' were the most commonly reported components in our framework. These key components, although identified using NIHR data, do reflect and build on the previous evidence of the key elements of good applications from other funding organisations.^{9 14} It is clear that quality of writing, the experience of the research teams, study justification and design, and a feasible work plan that is good value for money are all important factors to developing a good application from the point of view of NIHR and other funding organisations.^{9 14} Having said this, some of the components are potentially more relevant to NIHR or specific remits of funding (programmes such as HTA) than other funding organisations, such as 'meeting the brief' or 'blinding and randomisation'. In contrast, innovation is often considered a key factor in good applications.⁹ However, this was not found in our analysis which could be a reflection of the remit and criteria for these NIHR programmes. Instead, for NIHR, the feedback suggested that fresh insight and filling a gap in research and acceptability to patients, public and

healthcare professionals were important factors to consider when submitting research applications.

Our framework can be used more widely to highlight the common areas for improvement. For example, in terms of 'Study justification and design', the feedback most often asked applicants to re-examine the estimates used in their sample size calculations (concerns the analysis being underpowered) and the number and choice of primary or secondary outcomes. We also found that the qualitative design and process evaluation elements were often felt to be underspecified and/or an afterthought in the project design. This potentially indicates the need for specific guidance and criteria on these components. In addition, our findings also highlight that funders need to check areas within feedback, such as ensuring that the feedback provided is consistent and relevant across and within the application stages.

Successful applications receive more feedback

Our analysis highlighted that in general more feedback was provided to successful applications than unsuccessful. Chen and Tsai¹¹ found in an educational setting, that greater improvements in application scores were related with the amount of feedback the applicant received. Although we cannot state whether application scores were improved in this study, as the scores were not examined, our analysis does indicate that the amount of feedback provided did potentially lead to improved applications as successful applicants received more feedback than unsuccessful applicants. Furthermore, Chen and Tsai¹¹ found that greater improvements in application scores were seen following the first round of feedback compared with later rounds. This suggests that NIHR applicants might benefit from more feedback at stage 1 compared with stage 2, something that according to our findings does not currently happen. Alternatively, the survey results showed support for having higher acceptance thresholds at stage 1. In other words, only putting through applications that have a high chance of being funded. Both of these options (increased stage 1 feedback or acceptance thresholds) could lead to reduced burden (cost and time) on researchers, reviewers and funding organisation staff at stage 2. Although helpful, providing better feedback does not fully address the burden applicants, reviewers and funding organisation staff face. The wider issue of limited and competitive funding resources ultimately dictates that many applications may go unfunded, despite the effort that has gone into writing, revising and reviewing them. Research has shown that funding organisations are more likely to make small tweaks to funding allocation mechanisms rather than major changes.²⁴ To address the issue of burden, alternative funding mechanisms may need to be explored by funders. For example, the Health Research Council of New Zealand uses elements of random allocation for making funding decisions in their Explorer Grant scheme.²⁵

Justification and detail needed by both committees and applicants

Feedback across all of the key components, in general, always requested more justification and detail. However, our survey respondents were frustrated by this feedback as it was not considered constructive and is seen, in part, as the direct result of limited word counts in the application form. The length of funding application forms varies across funders. Some funders use an expression of interest to start the process, others have a two-stage process, in which a shorter version of the stage 2 application form is used for the first stage or have one application for the whole process.²⁴ Reducing the length of the application forms is often explored by funding organisations due to the drive to reduce bureaucracy, the time and burden for applicants as well as funding staff and committees (see 26). It could be suggested that limiting word count may potentially lead to comments like this becoming more common. However, the findings from this study can help applicants to understand where the detail is needed, such as providing clear justification for sample size, and can help funding organisations and higher educational institutions to provide clear guidance, training and support on how to write funding applications succinctly and possibly offer examples to facilitate this. Additionally, our findings clearly showed that feedback often asked for changes to applications in terms of costs and design but this was not always specific or directive, especially for unsuccessful applications. This issue was raised by respondents in the survey, who felt that it would be beneficial if the feedback clearly indicated what the FC expected from changes. For example, applicants felt that it was particularly challenging to address requests for significant reductions in costs without specification of acceptable cost brackets or which elements of the design should be reviewed. Applicants felt that clearly specifying the desired change would reduce burden. Consequently, our findings show that funding organisations need to provide detailed and directive feedback on what elements should be prioritised and justified at each stage of an application. In addition, despite our document analysis showing that the tone of comments across applications were both positive and negative, the applicant survey suggested that more positive feedback on the strengths of the application would be welcomed. This indicates a mismatch between feedback and how it is perceived, which could potentially be addressed through clear structure of the feedback (eg, a strengths and weaknesses sections). However, it must be acknowledged that although funders are aware of the value of providing written feedback to applicants, they also need to balance resource in terms of time, cost and effort and so long, rich narratives may not be feasible.²⁴

Strengths and weaknesses of the study

This study has limitations. The results reported are based on NIHR applications covering a 1-year period. The NIHR continually evaluates its practice, and as such some of the issues raised here may have already been addressed. Furthermore, although the applications span four different NIHR research programmes, despite purposeful sampling, numbers were not equal for each and respondents were self-selected. Despite this, the qualitative data show that unsuccessful and successful respondents provided both positively and negatively toned comments and as such we are confident that comments were not unduly biased because of higher numbers of unsuccessful applicants that responded. The current research has directly examined FC feedback and converged findings from funder and applicant perspectives. This provides a unique perspective of key patterns in FC feedback which may be beneficial for other funding organisations to understand, develop and enhance the process of research funding. For applicants, having a greater understanding of FC feedback could reduce unnecessary burden for applicants in terms of time and cost. In addition, examining and triangulating evidence from different sources (ie, funder feedback and applicant perception of feedback) reduces the impact of potential biases that can exist when only taking account one perspective (funder or applicant).¹⁸

CONCLUSIONS

By exploring feedback and patterns across stages and outcomes, we identified the key areas that are commonly raised in feedback reports. Better understanding of these key areas and further insight of what FC are looking for can benefit both the applicant and the funder. By also incorporating the views of applicants, the findings could be used to develop and increase applicability of feedback for applicants and for FC members. This could be achieved by developing guidance documents to ensure that commonly reported areas in the feedback are covered in detail, and that feedback provided is constructive and directive for the applicant without being overly burdensome on the funder. More relevant guidance and feedback will help to facilitate applicants in developing their proposals to better meet the requirements of the funder. In turn the funder may receive better quality applications which could help reduce the time taken to identify the applications that should be put through to the following stage and potentially reduce the burden on reviewers. Future work could evaluate the impact of any guidance documents developed or additional mechanisms implemented on the quality of applications submitted and value of feedback to applicants, as well as potential time and workload burdens on funders and applicants.

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