

Annex

**Beyond Assumptions:
How humanitarians make
operational decisions**

Annex: Methodology

This annex provides a detailed account of the methodology undertaken in the ALNAP study *Beyond assumptions: How humanitarians make operational decisions*.

The annex describes each step of the methodology in detail (see Figure A1 for the process followed) including assumptions, limitations and challenges. Examples of the participant briefing sheet and a full list of questions included in the decision diary are included at the end.

Figure A1: Outline of study methodology



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A.1 Literature review

At the start of this research process, the authors conducted a literature review, which sought to answer the following questions:

- What sorts of operational decisions do humanitarians make?
- Are there elements of the humanitarian context that place specific demands or requirements on the process of decision-making?
- What challenges do these elements pose for decision-making in operational humanitarian response?
- What approaches to decision-making are proposed in the literature, and how relevant are they for operational humanitarian response, given the challenges of the humanitarian context?

The review considered over 100 documents (including academic and grey literature and humanitarian evaluations), identified from the following sources:

- A search of Google Scholar using the search criteria 'decision-making humanitarian OR emergency OR disaster', with the top 150 results reviewed for inclusion, of which 22 met the inclusion criteria.
- Five expert informants were asked to recommend relevant documents, which resulted in 14 further additions for review.
- A review of ALNAP researchers' own libraries of relevant literature, which added 10 documents to the review.
- Several additional documents were identified from the bibliographies of the original set of documents (snowballing).
- 40 humanitarian evaluations were selected from a set of 60 identified for the *2018 State of the Humanitarian System* report as being of high quality. The 40 were selected based on their relevance to this review (operational focus; evaluations of programming rather than of coordination or process; mention of decisions in text). All of the evaluations were published between 2015 and 2017 and represented humanitarian response across 29 countries.

Documents were included/excluded on the following basis:

- Documents about decision-making in a crisis environment where lives were at stake were included (e.g. a humanitarian crisis or an emergency incident). Decision-making which did not address a response in such a crisis (i.e. in a business context) was excluded.
- Documents that considered the provision of aid/responding to a crisis for large numbers of people (i.e. a flood or fire) were included. Documents that focused on decisions about one specific individual (i.e. clinical decisions about a specific patient) or that focused on other, non-lifesaving activities in a crisis environment (e.g. policing or warfare) were excluded.

- Documents that looked at operational decisions (i.e. Decisions about a specific humanitarian activity, normally taken at country level rather than at headquarter (HQ) level, around issues such as whether to do/ not do something, what to do and where, etc.) were included. Documents that focused on decisions around strategic issues (i.e. decisions about the structure/governance of humanitarian organisations) or around broader policy issues (i.e. decisions to set up a global network) were excluded.

These inclusion/exclusion criteria outline the scope of both the literature review and the rest of the research study – the research focuses on decisions made (at least in part) in country, about humanitarian response.

The literature review was published in April 2018 and can be accessed at: www.alnap.org/help-library/making-operational-decisions-in-humanitarian-response-a-literature-review. The literature review informed the research team’s questions and method for the rest of the study.

A.2 Development of research questions/hypotheses/assumptions

Following the literature review, the research team recognised both the lack of documented descriptive information about humanitarian decision-making currently available, and the need to better understand which decision-making approaches might be effective given the conditions under which humanitarian decision-making takes place.

The researchers sought to design a research methodology which would address the following objectives:

- Add to the evidence base/build theory by documenting the nature of operational decisions and decision-making in humanitarian response
- Test new hypotheses about the relevance/usefulness of different decision-making approaches in humanitarian response , and identify new hypotheses where appropriate.

And answer the following questions:

1. What is the nature of humanitarian decision-making? (What decisions are made? How are decisions made? Under what conditions?)
2. Do certain decision-approaches achieve higher quality decisions? Under what conditions?
3. How can those decision-making approaches be used most effectively by humanitarians?
4. What needs to change (for organisations, information managers, individual decision-makers, leadership teams, etc)?

Based on the literature review, researchers hypothesised:

- That decision-makers would experience a range of different circumstances in which they needed to make decisions and would use a range of decision-making approaches in different circumstances

- That analytic decision-making would be used more when circumstances were unfamiliar, not urgent, not uncertain and where participants had less experience and understanding of context – and would be more successful than other forms of decision-making under these circumstances.
- That naturalistic decision-making would be used more when circumstances were familiar, uncertain, or urgent – and would be more successful than other forms of decision-making under these circumstances.
- That naturalistic decision-making would be used more by participants who had more experience and understanding of context.
- That naturalistic decision-making approaches would not be used by groups, or when multiple agencies were involved.
- That decisions taken by groups would be of better quality than decisions taken by individuals
- That groups would be involved in decision-making where decisions were unfamiliar and the circumstances uncertain
- That decision quality would be lower in situations of stress, uncertainty, unfamiliarity and urgency.
- That significance may have an influence on decision quality, either positive or negative.
- That participants would seek more information when the situation was uncertain.
- That decision quality would improve where more information was available, and that this effect would be most marked for analytic decisions
- That level of humanitarian experience, level of experience in country, understanding of context and being from the country where you are working would all improve decision quality.
- That individuals with more experience would encounter more familiar decisions.

The research team held the following assumptions:

- That participants would be willing to submit diary entries about their decision-making.
- That participants would be honest when sharing information about their decision-making with the research team, as their information would be held confidentially and only reported anonymously.
- That it would be possible to categorise decision-making approaches.
- That participants would have access to smartphones and semi-regular Internet access.

A.3 Formation of advisory group

The research team convened an advisory group comprised of 4 individuals representing organisations who had done previous work on humanitarian decision-making, or whom had made an institutional commitment to the study. Advisory group members were from World Vision, IRC, Concern Worldwide and the National Alliance of Humanitarian Actors Bangladesh (NAHAB).

The purpose of the advisory group was to provide support/guidance to the researchers in order to improve the quality and relevance of the research study. The advisory group informed the research at three critical stages:

1. During data collection, in particular around how to determine the quality of decisions
2. During drafting, to peer review the draft paper
3. After drafting, to inform the development of supplementary materials to the study.

Advisory members also helped to test the CrowdLab app and reviewed the methodology to be used to assess decision quality.

A.4 Selection of study methodology

With the joint aim of contributing to the documented descriptive evidence base around humanitarian decision-making, and testing hypotheses about the use and effectiveness of different decision-making approaches, the research team considered a number of different potential methods including the use of vignettes to test decision-makers in different scenarios and participant observation. Ultimately, a diary approach was selected because it would allow researchers to:

- Document, in some detail, the nature of decisions being made in current humanitarian response contexts (including what decisions were made and under what conditions)
- Provide detailed insight into the decision-making process for a large number of decisions
- Test hypotheses about the use and usefulness of different decision-making approaches in humanitarian response
- Work with decision-makers in a variety of different response contexts (and therefore varying levels of urgency, uncertainty and so on) remotely
- Not intrude on participants' time and adapt to participant schedules
- Collect information on a wide range of different decisions in a standard format, which would allow for statistical analysis
- Make use of a combination of qualitative and quantitative information.

The research team paired the remote diary method with an in-person briefing with each participant and two follow-up interviews to dig deeper into particular decisions and themes at different points in the research process. Researchers also collected further information from participants at the start and end of the study.

Researchers decided to use an app for the diary study. This allowed participants to submit diary entries wherever they were, without having to remember to bring a paper journal with them. It also allowed the research team to know when entries were submitted, so participants who fell behind the agreed schedule could be reminded.

As part of the selection of this methodological approach, the research team undertook a literature review of 34 documents about diary methods and designed the study based on key learning points from this review. The research team is currently drafting an article exploring this literature review and the findings related to the diary study methodology – at the time of writing, this is forthcoming.

A.5 App selection + question design and testing

The research team considered over 20 potential apps¹ for use in the study, ultimately selecting CrowdLab. Critically, CrowdLab included a ‘skip logic’ feature which would save time, allowed participants to submit diary entries when they were offline, allowed reminder notifications to be sent to participants, and allowed participants to choose whether to submit each open-ended response in either audio or text.

The questions included in the app were determined by the research objectives and hypotheses. They included questions asking the participant to give a general description of the decision (what it was about, how long it took); a number of questions about the circumstances under which the decision was being taken, focussing on areas that had been identified as important in the literature review; and questions on the process that had been used to come to the decision.

A.6 Participant selection and briefing

Initially, the research team attempted to identify participants using the same approach which had been successful with prior ALNAP leadership research (Knox Clarke, 2014) – contacting headquarters at a range of member organisations to ask them to engage institutionally in the research. Unfortunately, most organisations, while supportive of the research objectives, had concerns about the time that would be required from field-based decision-makers and declined this opportunity.

A more successful approach to identifying participants was to select specific countries to engage in the research (allowing a range of different humanitarian environments to be considered) and then contact decision-

makers in-country directly, describing the nature of the research project, what was being asked of them and what incentives were offered in return. Eight countries were selected, in an attempt to reflect different geographies and different operational contexts (see below).

Participants were asked to submit 30 decisions over a six-week period, and to participate in a half day briefing session and two 45-minute interviews plus ad hoc questionnaires at the start and end of the study period. In return, participants had the chance to contribute to the research, and the research team made a commitment to return to those countries and organisations where there had been sufficient contribution to the study to share findings. Those participants who completed the study in full (those who submitted close to 30 decisions, completed two interviews and all the ad hoc questionnaires), were offered three one-hour sessions with a professional leadership coach. Coaching was provided confidentially, outside of the research process, as recognition of the contribution that participants had made, and to provide participants with the opportunity to further consider any issues or questions that participation had raised for them.

Over 70 participants agreed to participate, 55 submitted one or more decisions, and 32 'completed' the study (submitted 15+ decisions, completed both interviews and all questionnaires). Of the 55, 18 were from ALNAP member organisations and 37 were from non-member organisations.

A.6.1 Participant demographics

As described, participant selection was opportunistic within preselected countries and criteria (see below for discussion about the lack of a representative sample). Ultimately, 40% of participants were female and 60% were male. Participants also provided their age – with the largest group within the 35-44 age range.

	25-34	35-44	45-54	55+	Unknown
Count	16	22	7	7	3
Percentage	29	40	13	13	5

A.6.2 Location of participants

The research team selected a group of eight active humanitarian response contexts chosen to represent a diversity of geographic regions and different crises types. Within each location, researchers attempted to identify a similar number of participants in each context. The 55 participants came from the following mixture of countries at the start of the diary study.

A handful of study participants moved locations during the study: one moved to Yemen, and others moved within the above list.

42% of participants came from the country in which they were working at the time of the diary study, with 58% being international staff. 60% worked for INGOs, 25.5% for NNGOs, 7% for the UN, 5.5% for national RCRC societies and 2% for donors.

Country	Number	Percentage
Lebanon	9	16
Jordan	1	2
Turkey	5	9
Bangladesh	15	27
Kenya	4	7
Somalia	4	7
Nigeria	6	11
Ukraine	11	20

A.7 Study protocol and reality

The table below illustrates the list of tasks each participant was asked to do, and the reality of the study.

A.7.1 Assessing decision quality scores

To identify the quality of decisions submitted within the study, the research team conducted a non-systematic literature review of 50 documents. Documents were identified through literature scan, including searching Google Scholar for ‘assessing decision quality’, ‘good decisions’, and ‘evaluating decisions’, with further documents identified by a snowball search of the bibliographies of identified documents. Documents were then coded using MaxQDA. The full details of this process will be presented in a forthcoming method note and journal article.

The literature review identified two main approaches to assessing decision quality – looking at the quality of the process and of the quality of the outcome. The quality of the process used to make a decision is widely seen as fundamental to understanding the quality of a decision (Gino, 2016; Geisler and Allwood, 2015; Meissner and Wulf, 2014; Arvai and Froschauer, 2010; NHS, 2012; Elwyn et al., 2009; Davern et al., 2008; Wilson and Arvai, 2006; Dowding and Thompson, 2003; Pauker and Pauker, 1999; Sox, 1999). Simply put, when looking for good decision-making, ‘what happens before the decision is as important as what happens after it’ (Sox, 1999). Most of the methods identified to assess the quality of the process focus exclusively on analytical decision-making approaches, so would be unsuitable for use in this study, which sought to identify quality across different decision-making approaches. However, there were elements noted in the literature about the quality of the process, which would be applicable to quality of all decisions submitted in the study. These included correctly identifying the problem to be solved and appropriate use of information/experience.

Study elements by protocol and practice

Study element/task	Asked of participants	Reality of study
Briefing workshop	Each participant to attend in-person half day briefing.	50 participants attended the briefing in-person. Five participants had a briefing by Skype due to scheduling issues.
'About me' questionnaire	Each participant was asked to complete the 'about me' questionnaire.	All participants completed the questionnaire as part of the briefing session.
Decision diaries	Participants were asked to submit 30 decisions over a 2.5 month period. Specifically, they were asked to submit two decisions per day (the first they made in the morning and the first in the afternoon) for three weeks and then 1-2 per week for the remaining 9 weeks.	Of the 55 participants, only 24 submitted 30 decisions (including four who submitted just over this amount). The research team decided to consider those who had submitted 15 or more decisions as having 'completed' the study (and eligible to receive the coaching incentive). All participants struggled to submit two decisions per day and most took longer than the expected 2.5 months to complete the study, with the average length of completion being 3.5 months. In total, 1,054 decisions were submitted to the study – 19 were excluded either due to technical problems (audio submissions which did not capture) or were not within the scope of the study (personal decisions). So the study had a total 1,035 useable decisions.
Decision-making reflections	Participants were asked to submit ad hoc open-text submissions throughout the study period with any thoughts they had about decision-making. One reflection per week was suggested, but not required.	Few participants used this feature with only 44 reflections received, most of which were only 1-2 lines long.
'How many decisions?' task	Each participant was asked to provide a tally of the number of decisions they made on two random days, one in the first week of the study and again in the second week.	32 participants completed the task twice, 6 others completed it once and 17 did not complete it at all. Most participants did not do the task in their first or second week but on a random day at some point during the study period.

Study element/task	Asked of participants	Reality of study
Questionnaire about decision quality	Participants were asked to answer a seven follow-up questions about each decision they submitted, approximately two months after the decision was submitted.	Most participants submitted the answers to these questions – of the 1,035 useable decisions in the study, 993 had responses for these questions (from 51 decision-makers) Those four who did not respond were all within the group who had dropped out during the study. Most participants took longer to respond to the questions than anticipated, with the average response received 3.5 months after the decision had been submitted.
Follow-up questionnaire	Each participant was asked to complete a questionnaire about their experience in the study.	All 32 completed participants submitted the questionnaire.
Two interviews	Those participants who 'completed' the study (32) were asked to participate in two 45-minute interviews. The first interview focused on specific decisions the participant had submitted, and the second on some of the emerging findings from statistical analysis.	31 participants completed the first interview, and 29 completed the second. Interviews were scheduled later than initially planned due to the extension of the study period for some participants (who completed the study on a staggered basis) and researcher schedules.

The outcome of the decision (in other words, the consequences of the decision that has been made) is, for many, a key aspect in determining the quality of a decision (Geisler and Allwood, 2015; Dowding and Thompson, 2003; Higgins, 2000). As Davern et al. (2008) explain, 'if the outcome is good then, ipso facto, the decision was good'. While the outcome of a decision is often given much attention, it can be difficult to use it to truly determine the quality of the decision made. Outcomes can be determined by factors outside the decision-maker's control – good decisions don't always lead to good outcomes, and vice versa. And, it would be impossible to retrospectively determine the potential outcome of decision choices not taken, and so you cannot compare the cost/benefit of a decision outcome, or how it measures up to alternatives that were available to the decision-maker. There are elements, however, related to outcome which can be considered including whether the decision/its outcome are appropriate given the original decision problem, and whether the decision outcome is satisfactory for the decision-maker – a factor given particular importance by a number of scholars (Geisler and Allwood, 2015; Wood and Highhouse, 2014; Milkman et al., 2009)

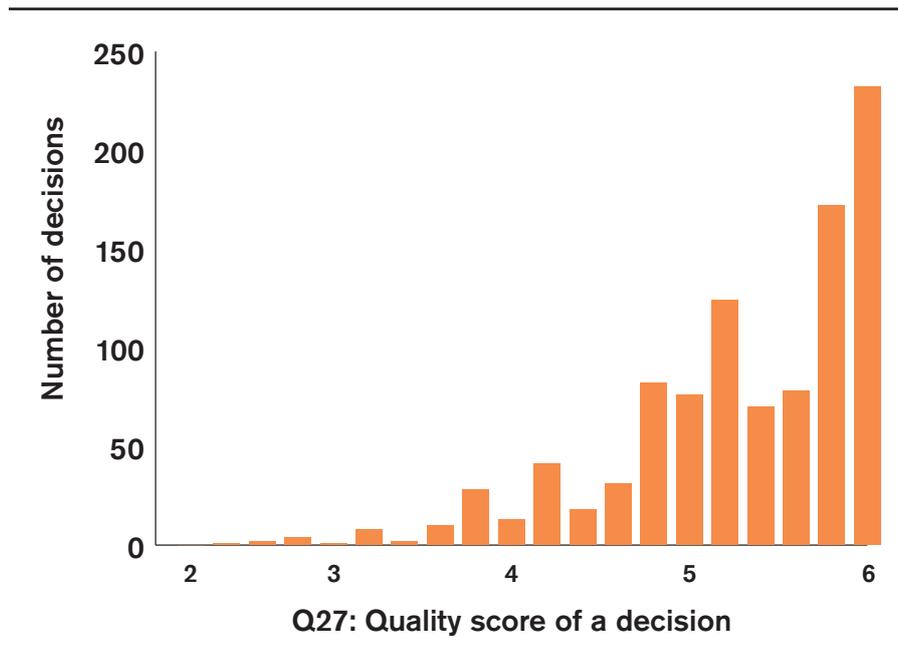
While process and outcome dominate in the literature on decision quality, other factors appear particularly important for humanitarian decision-making. These include the timeliness of decisions – that an appropriate amount of time is taken to make the decision; the actionability of decisions – whether decisions are ultimately implemented; and accountability/stakeholder engagement in decisions – that those who should have been involved in the decision were. Taking on board these and other factors, the research team used a set of seven questions (see 'decision quality questionnaire' on page X), to identify the quality of each decision. Each question had six multiple-choice options, which corresponded to a six-point scale, which were averaged together to establish an overall decision quality score.

The literature also had differing perspectives on when decision quality should be assessed (at the time of the decision or after an outcome is known, and who should assess the quality of the decision (by the decision-maker or by an external observer). The research team decided to assess the quality of the decision approximately two months after the decision had taken place. This was considered enough time for the decision-maker to have reflected on things such as their satisfaction and know whether the decision had/would be implemented, but also soon enough that they would remember who had been involved, how information had been used, and so on. The research team asked decision-makers to answer the decision quality questions themselves, an approach supported by the literature. This does make the responses subjective. However, a third-party would not have had access to key information which would be required to assess decision quality using the above metrics (Hershey and Baron, 1992; Skinner, 1999). And, the idea of using a third party to assess the quality of a decision against a normative standard have been questioned by some (Jungermann, 2000), particularly as to whether these models can truly depend on there being

an 'objective reality'. Comparing against a norm would only work for some kinds of decisions (Sainfort and Booske, 2000), and such a model used would only apply to one decision-making approach and so it would not be possible to assess all the decisions in our study against the same metrics. Additionally, the research team felt a subjective approach was appropriate given the nature of the research question – the research team did not seek to assess the quality of humanitarian decision-making with a view to making findings about the state of humanitarian decision-making overall. Rather, the aim was to look at any differences between the quality of decisions made in different circumstances and with different approaches. Results from the statistical analysis using quality scores are also compared and triangulated with literature review and interview data throughout.

As anticipated, the decision quality scores tended to be quite high on the scale. The median score was 5.4, while the mean was 5.3 (standard deviation 0.7). The lowest score was around 2.3, and there were several decisions (232 in total) which were scored by participants as 6/6 across all questions. The figure below shows the distribution of the quality score.

Figure A2: Distribution of the average decision quality score submitted by participants



Given the immense challenge of assessing the quality of any decision – an 'inherently complex and difficult task' (Elwyn and Miron-Shatz, 2009) and a problem for which 'there is no unequivocal answer' (Keren and de Bruin, 2003) – the research team are confident that this was the best available approach to identify the quality of the decisions submitted to the study. While it does not provide a reliable 'score' for any given decision, it does allow a better understanding of relative quality, and enable analysis of trends and potential relationships across the decision set.

A.8 Analysis

A.8.1 Coding and analysis of interviews

With participant consent, each interview was audio recorded (except two where the recording system failed). Following the interviews, the research team arranged for each transcript to be professionally transcribed. The interview transcripts were then coded using MAXQDA. The coding framework was established iteratively during the coding of the first round of interviews, beginning with research themes (codes for context, with sub codes for urgent; significant; uncertain, etc; codes for effects of contextual factors, with sub codes as above; codes for analytical, naturalistic, procedural, all with sub codes for process, positive reflections, negative reflections). Further codes were added after the second round, and the codes were then rearranged for clarity before analysis.

A.8.2 Statistical analysis of decision diaries

With the support of statistician Dr Elinor Mair Jones from UCL, statistical analysis was done to compare the nature of relationships between various different data points gathered in the diaries. These included:

- Data which was already in quantitative format (for examples, participants indicated the degree of urgency at the time of making a decision on a 1–6 point numerical scale).
- Data which was submitted in quantitative format and subsequently sorted into standard categories by the research team (for example, ‘what was this decision about’ was an open-response question, with responses grouped into categories by the research team).
- Data which was compiled in a quantitative format (for example, participants were asked to answer six different questions including whether the decision was made in an appropriate amount of time and whether the decision-maker was satisfied with the decision. There were six options, from ‘significantly disagree’ to ‘significantly agree’. These responses were turned into a quantitative number from 1–6, and then averaged together for a combined ‘decision quality score’.

Analysis for this report was conducted in Stata (version 15), with statistical graphics (not presented in the final report) produced in R (version 3.5.2).

The objective of statistical analysis was to consider an outcome variable of interest, and to understand whether/how other variables (described as predictors) are associated with this outcome.

Depending on the nature of this outcome, different (regression) models were used:

- When the outcome is continuous/numeric (e.g. the quality score, where any number can be chosen), (normal) linear regression was used.
- When the outcome is binary (e.g. doing something new, or not), then logistic regression was used.

- When the outcome has more than two categories, but the categories are unordered (such as decision-making type), multinomial logistic regression was used.
- When the outcome has more than two categories, but these are ordered in some way (such as number of years of experience), ordinal logistic regression was used.

The statistician also used descriptive statistics, which describe how the data have behaved and are backed up by graphics (such as box plots and mosaic plots) produced by R, as noted above.

The data used in this study proved complicating for statistical analysis. As each participant had repeated data points from each entering multiple decisions, a number of standard/basic statistic tests wouldn't work. The statistician had to employ more advanced techniques which controlled for patterns which may be attributable to individual decision-makers. The statistician used a range of statistical tests depending on the nature of the data points, the model and the relationship to be analysed. These included:

- F-tests – the default test for (normal) linear regression using Stata software – used to ask, 'are any of the predictor variables associated with the outcome variable?'
- Likelihood ratio tests – another default test in Stata– used to ask the same question, when using one of the other three models above (logistic regression, multinomial logistic regression and ordinal logistic regression)
- Wald tests – used when excluding certain predictors to ask, 'can we omit this set of variables from the model without harming the model's ability to predict the outcome?' (aka testing the hypothesis that certain predictor(s) don't have a significant influence).
- Fisher's exact test – where possible to look at relationships between variables where there weren't multiple responses from a single participant, such as gender versus experience, this test was used, as it can test for association between two categorical variables.

What is a p-value?

Statistical tests provide p-values, which help to show how likely it is that results have been produced by fluke. The smaller the p-value, the less likely that it's not by chance/there is a statistically significant relationship. There is no standard cut-off for what amounts to a very low p-value – a commonly used one is 0.05 though this is not rigorous. The danger of considering this as a cut-off is you might have a p-value of 0.06, and that might be interesting as well. The further it gets from this value, however, the less confident there is a relationship. While a small p-value can give you confidence, the opposite is not true. A large p-value can't prove that there is no relationship, just that one cannot be identified.

In some cases, most of the responses were gathered around a few of the categories in the data, leaving other categories with very few responses. For example, when comparing level of experience with decision-making approach, the statistician found that many resulting categories had very few decisions. In these cases, where there is insufficient data in certain categories, any results must be treated with caution. These have been noted throughout the study.

A.9 Limitations/challenges

Challenges relating to the statistical analysis have been outlined above. A number of further issues confronted researchers over the course of the study, including the following.

A.9.1 Not representative sample

With an estimated 570,000 field personnel working in the humanitarian sector (ALNAP, 2018), though without information about who amongst these are decision-makers, it would have been extremely difficult for the research team to solicit diaries from the numbers of people that would be required to create a statistically representative sample. It was difficult to be selective in any way about participants, with the only criteria ultimately being that they were working in a current (predetermined) humanitarian response, were responsible for making decisions about that response, and were willing to take part. As the sample is not representative, the findings may not be universally applicable. However, the research team intentionally looked for participants working in a variety of different humanitarian contexts, organisations and roles.

Because of this, and because of the triangulation between primary and secondary data in this study, the research team are reasonably confident the findings are generally applicable to the sector.

A.9.2 Participant engagement and retention

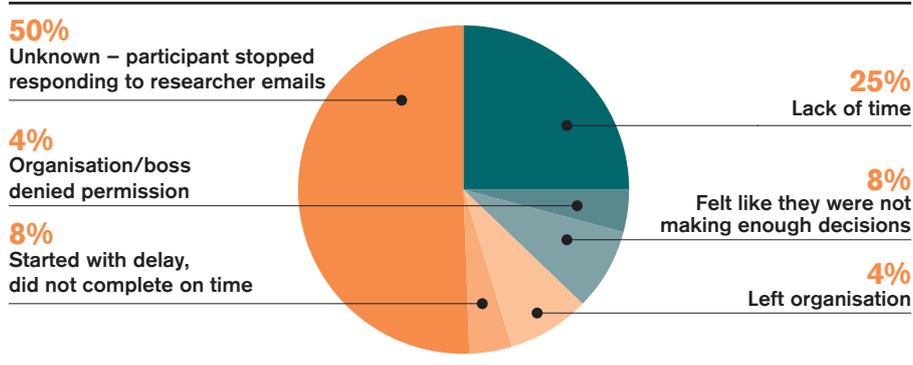
Participants in the study found submitting the diaries on a regular basis quite challenging. Most requested regular reminders to be sent to them, which had to be done manually by the research team and did not always prove effective. The 32 participants who completed the study demonstrated a monumental commitment to the study – 23/32 participants surveyed at the end of the study reported the most challenging part of participating was finding the time to submit decisions.

Given these challenges, it is no surprise that a number of participants dropped out. Of the 55 participants, only 32 ‘completed’ the study (and eight of these didn’t quite reach the initial goal of 30 decisions). 7 participants dropped out immediately following the briefing session, suggesting once they understood the nature of the study they were not willing to continue. A further 15 participants dropped out after submitting between 3-17

decisions, and 2 participants started the study at significant delay to the other participants and, while regularly submitting decisions at the end of the study period, did not reach the required minimum 15 decisions to be considered to have ‘completed’ the study.

Participants who dropped out were asked why they weren’t able to continue. Reasons provided were as follows:

Figure A3: Reasons for dropping out of the study



Overall, the dropout rate for this study was lower than researchers had expected. The review of other diary studies conducted by the research team identified that dropout rates are often much higher than this for studies with similar requirements for participants. The research team had hoped to recruit 50 participants and have 20 complete the study, and ultimately 55 were recruited and 32 completed.

Most of the participants from NNGOs were among the dropouts. Of the 14 who began the study, only 3 completed it – and 8/11 of the dropouts did so immediately following the briefing session. One possible explanation is a lack of clarity about the ‘ask’ of the research and the purpose of the briefing session, which may have been due to language barriers.

A.9.3 Subjectivity of responses/quality scores

Due to the nature of the study method, many of the responses provided by participants are subjective, including the degree of urgency or stress in a given moment, which would likely have been reported differently by another individual. Furthermore, the study does not provide an objective measurement of the quality of any given decision (see the above section, Assessing decision quality scores, for a longer discussion on this).

A.9.4 Problems with responses – misinterpretation of questions, inconsistent responses, etc.

While each participant received a half-day briefing session with one of the research team, which included submitting a first diary entry so that there was clarity about the questions being asked, it became clear that not all participants understood the nature of each question in the same way. For example, during interview one participant who had rated most

of his decisions as taking place in circumstances of quite low uncertainty explained that he understood uncertainty to mean his own understanding of the context. This was not the interpretation the researchers had intended, and only appears to have been misunderstood by this one participant.

Researchers asked participants to submit the first decision they made in the morning and the first in the afternoon, in order to have a random selection of decisions, of varying levels of significance. Despite this instruction, some participants did explain in interview that they had prioritised submitting significant or interesting decisions. It is clear from the decision set that a wide range of decisions, including varying levels of significance, were submitted. But, particularly given the variability between participants here, the data set should not be considered a representative sample of all humanitarian decisions. This is mitigated by the size of the data set, and through controlling for patterns inherent within any one decision-maker's submissions, in statistical analysis.

A further limitation is that, as noted above, many of the responses were subject to the participant's perception at a given moment. Over the course of the study, there were a handful of times where data was entered twice by participants. These occasions revealed the subjectivity of the responses, as responses submitted by the same participant about the same decision, within a few days, differed.

A.10 Questions and Forms

A.10.1 Sample Agenda for Briefing Session

Decision-making Briefing Session Tuesday, 31st July 2018 Izyum, Ukraine		
Timeframe	Topic	Notes
12:15-1pm	Lunch	
1-1:20	Introductions	Round of introductions Introduction to ALNAP Introduction to the decision-making research Q&A
1:30-1:45	Role of the participant	Expectations/responsibilities of participants Incentives for participants Q&A
1:45-2:00	Research process	Data protection and confidentiality Research process and outputs Q&A
2:00-2:15	Decision Terminology	What counts as a decision? What kinds of decisions should be included? Q&A
2:15-2:30	Comfort/coffee break	
2:30-3:40	Introduction to the app	Getting familiar with the app Completing first tasks Solving technical problems Participant Q&A
3:40-3:50	Participant questions	Any further clarifications needed
3:50-4:00	The way forward	Recap of: Exact schedule for submission of diary entries What to do if you have a technical issue Contacting us & us contacting you

A.10.2 Sample Participant Guide

Participant Guide – ALNAP Decision-making Diary Research Study

What is ALNAP?

ALNAP (The Active Learning Network for Accountability and Performance in the Humanitarian System) is a network of humanitarian organisations. We have 105 member organisations including UN, RCRC, NGOs, Academia, donors, other networks, etc. On behalf of the network, the ALNAP Secretariat, hosted by the Overseas Development Institute in London, carries out research and convening activities to improve humanitarian response through learning. ALNAP's research aims to have practical and/or policy applications.

The research is led by Leah Campbell and Paul Knox-Clarke.

Leah Campbell is a Senior Research Officer at ALNAP. She has worked at ALNAP for 6 years. Alongside the leadership and coordination work, Leah leads ALNAP's work on urban humanitarian response. She has a background in community and youth work, and is originally from Canada. Leah has an M.A. Development and Emergency Practice from Oxford Brookes University.

Paul Knox-Clarke is ALNAP's Head of Research. He has been with ALNAP for 8 years. Before joining ALNAP, Paul was the director of a consulting company specialising in organisational effectiveness in international organisations. Paul has also worked for WFP, where he established the UN's food security monitoring unit for Afghanistan before working on issues of policy (and particularly policy related to accountability and participation) and organisational effectiveness at WFP's HQ. He has a background in anthropology and began his career with Save the Children UK, where he worked on food security issues in several SC (UK) programmes.

What is this research about?

Effective humanitarian response requires the ability to make good decisions under pressure, in situations where much is unknown and where the stakes are extremely high. Many decisions need to be made. Decision-making is often cited as being problematic in evaluations and other research. In some cases, decisions that should have been made were not, the wrong decision got made or decision-making took too long.

While each individual may know a lot about their own decision-making, there has been little research in the humanitarian sector so far on this topic. Research in other sectors has identified a number of different approaches to decision-making, but due to the lack of documentation about the sorts of decisions humanitarians make, it is not clear which of these might be appropriate and useful in humanitarian crises. If more is known about the nature of the decisions humanitarians make, we can connect this to the evidence about decision-making in emergencies.

As well, the research aims to get a sense of what's working in humanitarian decision-making – which decisions are good, and whether there are any patterns to what works.

What is the role of the participant?

This research depends on the participation of individual humanitarian decision-makers (you!). As well as attending today's briefing session, you are being asked to complete diary entries when making decisions, answer follow-up questions as needed, and participate in two interviews.

Throughout, participants are asked to:

- Maintain good communication with the researchers – If you are on leave, unwell, or unable to complete diary entries as per the schedule below, let us know!
- Be honest – If your circumstances change, tell us so we can make alternative arrangements

Detailed schedule for submitting diary entries over the next 2.5 months

When	Task	Details
Today	Attend briefing session	You're here, first step complete!
Monday 30th July – Friday 18th August	Submit Daily Decision Diary entries Decision diaries are a set of open and closed questions. You will answer the same questions for each decision.	Starting Monday 30th July, you will complete the 'decision diary' task in the app, every day for 3 weeks. You are asked to log, at minimum, 15 decisions in the first 2-3 weeks. This works out to two decisions per day for the first two weeks OR 1-2 decisions per day for the first three weeks . This should be: <ul style="list-style-type: none"> • The first decision you make in the morning • The first decision you make in the afternoon (after lunch) You can submit more decisions if you wish to.
Between Monday 20th August and Friday 19th October	Submit Weekly Decision Diary entries	We are asking for the first decision you make in the morning and afternoon so that we have a sense of the breadth of different decisions you make (a proxy for randomisation). After two weeks of submitting decision diaries every day, you are then asked to submit 1-2 decisions per week for 9-10 weeks . These can be any decision you'd like to submit. You can submit more decisions if you wish to. Between the 15 decisions from the first 2-3 weeks and the 15 decisions from this period, you should submit, at minimum, 30 decision diary entries during the study period.

When	Task	Details
<p>Between Monday 30th July and Friday 19th October</p>	<p>Short ad hoc tasks throughout the diary period.</p> <ol style="list-style-type: none"> 1) Submit Decision-making Reflections 2) Ad hoc tasks on the app: About Me, Number of decisions count, Post-study questionnaire 	<ol style="list-style-type: none"> 1) Throughout the entire period you're submitting decision diaries, you are asked to also complete decision-making reflections whenever relevant. This can include, for example: <ul style="list-style-type: none"> • When you have an update about a previous decision you made • If you have a reflection to share about your own or someone else's decision-making • Where you think a decision should be made but it is not (please tell us why) <p>There are no specific number of entries required for this task.</p> <ol style="list-style-type: none"> 2) About me – Later today everyone will complete this together <p>Number of Decisions – Twice in your first two weeks, you will be prompted to carry out a tally of the number of decisions you make that day. Please do this on the day you receive the task, or the day following. Just count each decision and at the end of the day, submit the total number.</p> <p>Post-study Questionnaire: In your last week of entering decisions, you'll be asked to complete a set of questions about decision-making and your participation in the study</p> <ol style="list-style-type: none"> 3) You will be asked to tell us about the quality of each decision you record in the study, 10-12 weeks after that decision was made. You'll review the submissions you made at the time and answer brief questions about each decision. More details will be provided at the time.
<p>From mid-September to December</p>	<ol style="list-style-type: none"> 3) Decision quality follow-up questions 	
<p>In late October and late January</p>	<p>Interviews</p>	<p>You will be asked to participate in two interviews, by phone/Skype, conducted by either Leah or ALNAP's Head of Research, Paul Knox-Clarke. These will be scheduled at your convenience and take approximately 45 minutes each.</p>

What are the benefits of participating?

By participating actively in this research, individual decision-makers will:

- Contribute to an important piece of research which will identify concrete recommendations to improve humanitarian decision-making
- Gain early access to research findings for themselves and their organisation
- Receive the opportunity to represent their organisation at workshops and events, as feasible/relevant throughout the research
- Receive individual coaching support during the dissemination phase of the research in the form of 1-2 personalised sessions with an experienced coach who will help them reflect on their own decision-making approach and areas for improvement (Note – coaching will only be available for participants who complete the entire study)

What are the disadvantages of participating?

- Participation will require a minimal but consistent time commitment from participants

How is my data protected and used?

Protecting your information is of utmost importance. The research study has been designed with data protection and confidentiality in mind, and the app, and ALNAP, are compliant with the EU's General Data Protection Regulations which came into effect in May 2018.

Following the study, the entries you have submitted will be extracted from the app. Your responses are associated only to a participant ID number when stored. Following the study period, CrowdLab will delete all data from this study. The only people who will see your responses are ALNAP staff and sub-contractors who have signed confidentiality agreements (a transcriptionist who will type up all audio responses, a statistician who will support with quantitative analysis and a research assistant who is providing ad hoc support to the study).

The diaries are one part of a broader research study, which will be written up in a final report and published in summer/fall 2019. ALNAP may also publish aspects of the research in academic journals or shorter summary publications. As per ALNAP standard practice, all quotations from the diary entries and interviews with participants will be anonymised – no participants or organisations are identified with specific responses. All participants will have the opportunity to read the draft final paper and to flag any concerns about anonymity before publication.

The research is guided by an advisory group which includes HQ colleagues from Concern Worldwide, World Vision, IRC, ACF and NAHAB to date. The research is being conducted with participants based in Turkey, Lebanon, Bangladesh, Kenya, Somalia, Nigeria and Ukraine.

Using the App

During the briefing, we will:

- Download the app and register
- Complete the 'Welcome' and 'About Me' tasks
- Complete a first 'Decision Diary' entry and Decision-making Reflection
- Look at how to get in touch, view your past submissions, and answer follow-up questions

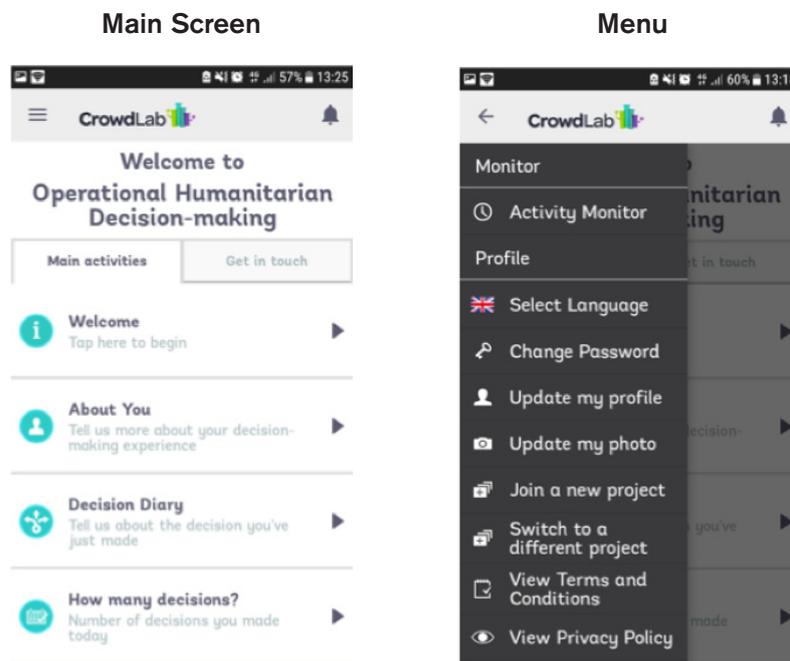
You should now be familiar with the app, but below are some reminders.

The *Main Screen* of the app is shown below. To complete a new 'Decision Diary' submission, click on 'Decision Diary' and answer the questions.

There are three types of questions: buttons (choose one), slider (drag the circle to where you want it to go), and open-ended (you can answer using text, audio or video – whichever is most convenient at the time). For audio & video responses, there is a 5 or 10-minute maximum recording length – don't worry if your submission is much shorter. This is a maximum length, just in case, not a target to hit.

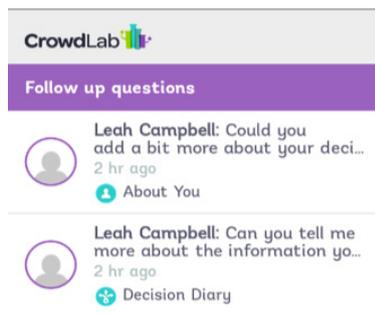
Remember, now you've downloaded the app, you can submit entries at any time, even if you're not online. Any entries you submit will be saved and uploaded when you are next connected to Wi-Fi.

If you click on the three lines, in the top left corner, you will see a *Menu*. Here you can access the App's terms and conditions, change your personal details and access the *Activity Monitor*.

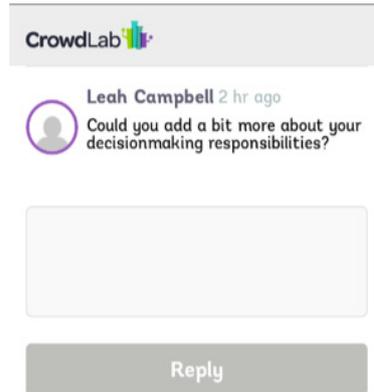


On the *Main Screen*, if you click the bell icon in the top right corner, you can access any notifications you may have received from the researchers. They will appear in a *follow-up questions* menu. If any follow-up questions are sent to you, you will also get a notification on your phone.

Notifications/Followup ?s Menu



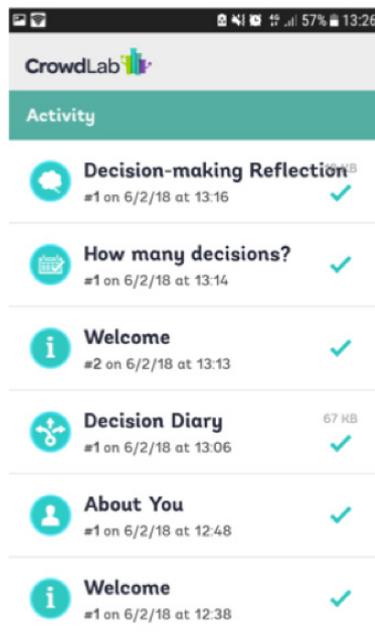
Example Follow-up Question



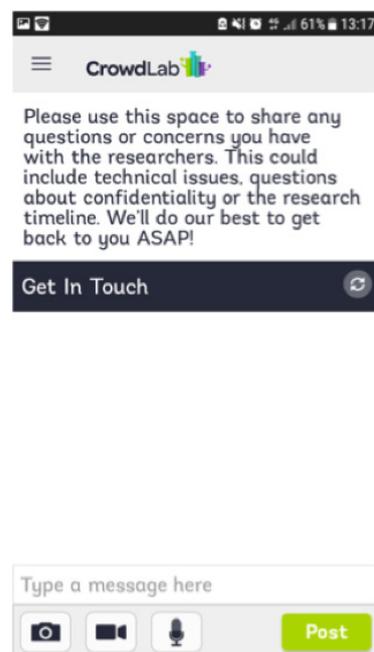
You can visit <https://crowdlab.allchannelsopen.com> to view your past submissions, using the same log in details you set when registering for the app.

If you click *Activity Monitor* in the *Menu*, you will get a list of all your prior submissions, for reference. The green checkmark indicates the entry and all audio submissions have been uploaded. On the *Main Screen*, you will see the list of tasks (Main Activities) by default. You can click on 'Get in touch' to send feedback to the researchers if you have a question or concern about the app, the schedule, etc.

Activity Monitor



Get in touch



How much detail do I need to provide in decision diary entries?

Remember: we don't know your organisation/project – give a bit of background so it makes sense. You will also need to be able to identify which specific decision this was when you tell us about the quality of the decision.

‘What was this decision about? What decision was made?’ – Give some background on the topic & indicate what decision was ultimately selected & why

‘How was this decision made?’ – List the steps involved in some detail

Which decisions should be included in the diary?

Decisions are hard to define – they may not occur in one moment. In this research, a decision is understood as where there are more than one options theoretically available (whether or not you know/consider a set of options) and a choice/action is made.

This research focuses on decisions about the operational response to a humanitarian crisis. Below are a few examples of the types of decisions that are ‘in’ and ‘out’. If in doubt, include it!

In	Out
Work-related decisions, taken in a professional capacity as part of your role	Personal decisions (about your family, your career, your participation in this research, etc)
Decisions made about the response (Whether to fire staff for misconduct; whether to carry out programming in Beirut or Tripoli; what direction your organisation's response in Somalia will take)	Decisions made about the strategic goals of the organisation or sector (What the strategic focus of your organisation in Bangladesh will be over the next 5 years; decisions about the regional approach to shelter in the Middle East)
Decisions you are involved in (solely or as part of a group)	Decisions made entirely by someone else where you had no involvement (though you could mention these in your decision-making reflection)

What support is available to me?

- You can always contact the researchers with any questions/concerns
- We can send you reminder notifications through the app if you would find this helpful
- We will check in regularly to maintain good communication
- You can submit decisions when you're offline
- You can submit decisions at the end of the day or 1-2 days after making them, so long as you feel confident you remember the details well
- We will be flexible to accommodate your leave/training/busy periods

What do I do if I have questions?

You can contact the researchers at any point either within the app using *Get in touch* or by emailing Leah at l.campbell@alnap.org.

If we notice that you are not submitting entries as planned, or we need more information about one of your submissions, we will reach out either on the app or by email.

About you

The below questions were answered by each participant at the start of the study.

1. What is your current role?
2. Please describe your responsibilities in this role, particularly in regard to decision-making.
3. What is your overall level of operational humanitarian experience?
 - a. Less than 1 year
 - b. 1-2 years
 - c. 2-5 years
 - d. 5-10 years
 - e. 10-20 years
 - f. 20+ years
4. Which country do you currently work in?
 - a. Bangladesh
 - b. Lebanon
 - c. Kenya
 - d. Turkey
 - e. Somalia
 - f. Ukraine
5. How long have you worked in the country you currently work in?
 - a. Less than 1 year
 - b. 1-2 years
 - c. 2-5 years
 - d. 5-10 years
 - e. 10-20 years
 - f. 20+ years
6. Please choose the sentence most relevant to you:
 - a. I am from the country and local area that I am currently working in
 - b. I am from the country where I am currently working, but from a different area
 - c. I am not from the country where I am currently working
7. How similar is this crisis to your past humanitarian experience? Choose the most appropriate spot on this 1-6 scale.
 - (1) MINIMUM: Not at all similar
 - (6) MAXIMUM: Very similar
8. How well do you feel you understand this context? Choose the most appropriate spot on this 1-6 scale.
 - (1) MINIMUM: Not at all
 - (6) MAXIMUM: Very well
9. Choose the most appropriate spot on this 1-6 scale to finish the following statement: "Generally speaking, the decisions I make are..."
 - (1) MINIMUM: Of poor quality
 - (6) MAXIMUM: Of high quality

Decision Diary

The below questions were answered by each participant each time they submitted a decision diary entry.

1. What was this decision about?
2. How was this decision made?
3. Who made this decision? Please choose between:
 - a. I made the decision entirely on my own
 - b. I made the decision after asking individuals for their input
 - c. I made the decision after consulting a group about the decision
 - d. A group had a decision, proposed options and I made the decision
 - e. A group had a discussion, decided an outcome, which I approved
 - f. Someone else made the decision but I contributed to the process
 - g. Other – Please describe
4. Did this decision require coordination with other agencies/ organisations? Choose the most appropriate spot on this 1-6 scale.
 - (1) MINIMUM: This decision didn't take any account of other organisations
 - (6) MAXIMUM: This decision was made jointly with other agencies
5. How did you know a decision was required?
6. How long was the period between knowing and making the decision?
7. Choose from the sentence most applicable to this decision-making situation? (Choose A or B)
 - a. This decision was based mainly on intuition/knowing what to do
 - b. The decision was based mainly on analysis/thinking it through
8. ANSWER ONLY IF YOU CHOSE A: Why did you trust your intuition?
9. Choose the sentence most applicable to this decision-making situation:
 - a. I/we chose the first good option identified
 - b. I/we came up with a range of options and then compared them
10. Choose the sentence most applicable to this decision-making situation:
 - a. Relevant procedures/protocols for this decision situation do not exist
 - b. Relevant procedures/protocols for this decision situation exist, but were not used
 - c. Relevant procedures/protocols for this decision situation exist, and were adapted for use in this situation
 - d. Relevant procedures/protocols for this decision situation exist, and were followed as written in this situation
11. How much information was sought when making this decision? Choose one of the following:
 - a. I/we did not seek out any information
 - b. I/we sought out some information
 - c. I/we sought out a lot of information
12. ANSWER ONLY IF YOU CHOSE B OR C: What information did you seek out to make this decision?
13. Choose the best option. When making this decision, I was aiming to select:
 - a. The best/right decision
 - b. An acceptable decision

14. Is the following statement accurate in this situation? “The consequences of this decision mean that I will be doing something I haven’t done before.”
- a. Yes
 - b. No
15. How familiar was this decision situation to you? Choose the most appropriate spot on this 1-6 scale.
- (1) MINIMUM: Not familiar at all
 - (6) MAXIMUM: Very familiar
16. How urgent was this decision? Choose the most appropriate spot on this 1-6 scale.
- (1) MINIMUM: Not at all urgent
 - (6) MAXIMUM: Very urgent
17. How accurate is the following statement in this situation? “This decision will have significant consequences.” Choose the most appropriate spot on this 1-6 scale.
- (1) MINIMUM: Not at all accurate
 - (6) MAXIMUM: Very accurate
18. How much stress were you experiencing at the time of making this decision? Choose the most appropriate spot on this 1-6 scale.
- (1) MINIMUM: No stress at all
 - (6) A large amount of stress
19. The current situation in which this decision is being made is.... (Choose the most appropriate spot on this 1-6 scale).
- (1) MINIMUM: Known and understood
 - (6) MAXIMUM: Very uncertain
20. The way in which the situation will evolved in the future is... (Choose the most appropriate spot on this 1-6 scale).
- (1) MINIMUM: Known and understood
 - (6) MAXIMUM: Very uncertain
21. Is there anything else important that you would like to tell us about this decision, how it was made or the context in which it was made?

Decision Quality Questionnaire

The following questions were answered by participants, about each decision submitted, several months after the diary entry.

1. “I correctly understood the problem/situation before making this decision”. Please choose one of the following in response to this statement:
- (1) Strongly disagree
 - (2) Generally disagree
 - (3) Slightly disagree
 - (4) Slightly agree
 - (5) Generally agree
 - (6) Strongly agree

2. "I used relevant information/experience appropriately when making this decision". Please choose one of the following in response to this statement:
 - (1) Strongly disagree
 - (2) Generally disagree
 - (3) Slightly disagree
 - (4) Slightly agree
 - (5) Generally agree
 - (6) Strongly agree
3. "This decision was made in an appropriate amount of time for the situation". Please choose one of the following in response to this statement:
 - (1) Strongly disagree
 - (2) Generally disagree
 - (3) Slightly disagree
 - (4) Slightly agree
 - (5) Generally agree
 - (6) Strongly agree
4. "The level to which other people were involved in making this decision was appropriate for the situation". Please choose one of the following in response to this statement:
 - (1) Strongly disagree
 - (2) Generally disagree
 - (3) Slightly disagree
 - (4) Slightly agree
 - (5) Generally agree
 - (6) Strongly agree
5. "The chosen course of action was appropriate given the original problem/situation". Please choose one of the following in response to this statement:
 - (1) Strongly disagree
 - (2) Generally disagree
 - (3) Slightly disagree
 - (4) Slightly agree
 - (5) Generally agree
 - (6) Strongly agree
6. "The decision was implemented/followed through". Please choose one of the following in response to this statement:
 - (1) Strongly disagree
 - (2) Generally disagree
 - (3) Slightly disagree
 - (4) Slightly agree
 - (5) Generally agree
 - (6) Strongly agree
7. "I am satisfied with this decision". Please choose one of the following in response to this statement:
 - (1) Strongly disagree

- (2) Generally disagree
- (3) Slightly disagree
- (4) Slightly agree
- (5) Generally agree
- (6) Strongly agree

8. Do you have anything else you want to tell us about this decision?

Interview Protocol Round 1

Before interview:

- Interviewer to review all decisions submitted by participant
 - Identify any trends within that participant's entries (always use same process?)
 - Choose 2 decisions – one very urgent/uncertain, one not at all urgent/uncertain which appear illustrative of the approach decisionmaker tends to take in those circumstances
 - Identify any decisions where, if there's time, it would be useful to have more detailed explanations

During Interview

- Ask for consent to record
- Explain what remains:
 - Will send questions to understand decision quality for your 11-30 decisions
 - Post diary questionnaire
 - Another interview around January
- This interview to take approx. 45 minutes, will focus on 2 decisions plus some themes in your entries and, if time, additional information we need to understand your decisions.
- Ask decisionmaker about each of the two selected decisions. Don't explain why the decision was chosen (so as not to bias their responses) but ask:
 - Recap the decision-making process used and why (summarise understanding and ask interviewee to expand)
 - Anything missing needed to understand decision in full?
 - Did the context (level of urgency/uncertainty) influence your decision-making? Is this usually how you would make a decision in similar circumstances?
 - Was this a group decision/require coordination with other organisations? How did that influence decision-making process?
- Trends in individual's decision-making:
 - *Check before interview: Did the individual use similar or different decision-making approaches depending on the degree of urgency/uncertainty?*
 - Ask why/why not the individual tends to vary their approach (is it because of context?)
 - What helps decision-making? What makes it more difficult?
 - Any decisions which didn't get made?
- Missing data:

- Some participants are generally good at providing sufficient level of information. Others consistently provided not quite enough info. Some started off not providing enough and got better. Based on the pre-interview review of the participant's decisions, ask them to expand on other decisions they made where more information is needed. Keep this short, and only fit in if there's time at the end.

Interview Protocol Round 2

Second interviews:

- To get participant insight on trends in the data
 - Match trends/findings with participants who exemplify this and discuss to understand more (so not all participants will discuss all trends)
- To get participant insight on topics not covered by individual diaries
 - Group decision-making
 - Collaborative decision-making
 - Etc
- To follow-up on any missing info such as incomplete decision quality scores
To give participants final opportunity to share insights

The following questions were asked during interview round 2. Each participant was asked approximately 7 of the below questions.

1. Are you familiar with the humanitarian principles? Can you think of a time where ethics/principles have influenced your decision-making? Describe how they influence the decision-making process. Do they help or make it harder? Is there a difference between using ethics in intuitive and analytical decision-making?
2. Looking back over the past year, are there any decisions that were required that you didn't recognise at the time, but with hindsight, you wish you'd identified and made decisions about? If yes what were they? Why do you think you didn't notice the need to make a decision at the time? What do you know now that you didn't know then?
3. Under what circumstances do you make a decision alone vs in a group? Do groups make the more difficult decisions? What is the comparative advantage/disadvantages of group/individual decision-making? What does it take to make a good group decision? How can groups be most helpful in the decision process?
4. How do you come up with something new? Where does the new thing come from?
When you do something new, how does that happen?
What are the challenges/enablers to doing something new?
5. The early statistical analysis suggests that use of analytical decision-making increases with amount of humanitarian experience, whereas we would have expected this not to be the case. Do you have any thoughts as to why this is?

6. Do you think that coming from a country, or working in it for many years, helps you to make better decisions in an emergency? Why?
7. In the early statistical analysis, individual decision-making appears to be perceived as higher quality decisions compared to decisions made by individuals consulting others. Why might that be?
8. Tell me more about hybrid decisions (those which were neither NDM or analytical). Is it a flaw in how we asked in the diary that the categories aren't clear? Or is it blended?
9. Think of a recent analytical decision you've made, tell me about the process. If it involved weighing up options, what criteria used? When deciding between A and B, what matters?
10. When making a naturalistic decision, tell me more about seeking lots of information. Why is information sought? What information is sought? When in the process is it sought? Where are you getting information? How is intuition+ information collection different than analytical decision-making?
11. Why are decisions with either none at all, or the most coordination (1 or 6), the highest quality?
12. Do you think that decision-making approach should change depending on how much knowledge of context one has? Theory suggests that the better the context is known the more NDM is appropriate, but early statistical analysis doesn't show this.
13. Why do decisions get better as they become more urgent? And, should decision-making type change with urgency? Why?
14. When you are not sure how a situation will unfold, do you find that collecting more information helped you be more sure of what would happen in the future? Can you have too much information? Is it obvious what information is impossible to get?
15. How does stress affect your decision-making? Why do you think highest stress decisions come out as best quality (alongside lowest stress) in early statistical analysis?
16. Overall, the early statistical analysis shows little difference between the quality of decisions in familiar and unfamiliar situations – why do you think this is?
17. Why do the most uncertain situations produce the best decisions?

Endnotes for the Annex

1. When looking for potential apps, the research team found the following pre-existing lists useful: <http://www.otago.ac.nz/psychology/otago047475.pdf> and <https://airtable.com/tbl5VMl0FsvDecIoZ>.