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Can rapid approaches to qualitative analysis deliver timely, valid findings to clinical leaders? A mixed methods study comparing rapid and thematic analysis

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ABSTRACT

Objectives: This study compares rapid and traditional analyses of a UK health service evaluation dataset, to explore differences in researcher time, and consistency of outputs.

Design: Mixed methods study, quantitatively and qualitatively comparing qualitative methods

Setting: Data from a home birth service evaluation study in a hospital in the English National Health Service which took place between October-December 2014. Two research teams independently analysed the data: one team used a Thematic Analysis approach using the Framework Method, and the second used Rapid Analysis.

Participants: Home birth midwives (6), midwifery support workers (4), commissioners (4), managers (6), and community midwives (12) and a patient representative (1) participated in the original study.

Interventions: None

Primary outcome measures: Time taken to complete analysis in person hours; analysis findings and recommendations matched, partially matched, or not matched across the two teams.

Results: Rapid Analysis data management took less time than Thematic Analysis (43 v 116.5 hours). Rapid Analysis took 100 hours, and Thematic Analysis 126.5 hours in total, with interpretation and write up taking much longer in the Rapid Analysis (52 v 8 hours). Rapid Analysis findings overlapped with 79% of Thematic Analysis findings, and Thematic Analysis overlapped with 63% of the Rapid Analysis findings. Rapid Analysis recommendations overlapped with 55% of those from the Thematic Analysis, and Thematic Analysis overlapped with 59% of the Rapid Analysis recommendations.

Conclusions: Rapid Analysis delivered a modest time saving. Excessive time to interpret data in Rapid Analysis in this study may be due to differences between research teams. There was overlap in outputs between approaches, more in findings than recommendations. Rapid Analysis may have the potential to deliver valid, timely findings while taking less time. We recommend further comparisons using additional data sets with more similar research teams.

Keywords

Qualitative Research

Health Services Administration & Management

Maternal Medicine

Strengths and limitations of this study

- Our study explores a strategy to address the time-lag in reporting qualitative findings to clinicians and policymakers, which slows translation of research into practice.
- This is the first comparison of qualitative analytical methods in applied health research which compares both researcher time *and* outputs, with a complete study dataset.
- The work describes the process of comparing time and analytical outputs in detail, to inform others planning further methodological comparisons.
- Due to the time lag in thematic analysis outputs, our study did not triangulate findings with the original participants.
- The study uncovered important challenges in comparing analytical approaches between research teams which can inform the design future work in this area.

BACKGROUND

Applied health research frequently adopts mixed methods, often using qualitative approaches.[1] Applications of qualitative methods include: early work to identify areas for focus; throughout a study to provide continued user experience; following a trial or intervention implementation to explain outcomes and/or identify stakeholder experiences.[2] Increasingly this type of research can include a broader range of contributors, for example where members of the public, patients, clinicians, and researchers are involved in analysing and interpreting data to ensure a multi-disciplinary perspective, or pragmatically using several researchers to code data in the interests of time.[3, 4]

Typically stakeholders want rapid results,[5] yet traditional qualitative approaches often considerable time is required to manage and interpret data, and deliver findings.[6, 7] In a service context, delays may render the findings out of date, reducing their applicability and relevance. There are examples of apparently more rapid alternatives to traditional qualitative approaches.[7-11] There are three broad areas where time can be saved; by reducing data collection time, for example by relying on untranscribed audio recordings, notes, summaries and mind maps;[8-10] by minimising the time spent managing data by summarising as opposed to formally coding;[9, 11] by limiting the time spent on analysis by using a 'one sheet of paper' summary to explore a sample of a large pre-coded dataset.[7] What remains unknown is whether rapid methods of analysis deliver equivalent findings to traditional approaches, or how much time they save in practice.

There are a limited number of studies that have compared different qualitative analytical techniques.[9, 12-14] In some of the empirical examples identified, methodologists have predominantly compared methods of data collection (e.g. interviews versus internet forums[12]), and focused on content analysis rather than interpretation. Of the three examples identified that compare analytical approaches one used focus group data to compare thematic analysis of a partial

dataset with mind-mapping of a full dataset.[9] While this paper provides minimal detail regarding the method of comparison, it reported differences in time taken to analyse the data, and in the number and presentation of codes. The second example compared software-assisted and constant comparative approaches to analysis describing differences in the frequency of codes and coding levels.[13] The third example compared analysis of focus group data directly from audio recordings, with thematic analysis of transcribed data, and found that themes generated were comparable.[14]

The work we present here was conducted as part of the Collaboration for Leadership in Applied Health Research and Care (CLAHRC) programme in the West Midlands of England. CLAHRC involves local teams across Universities and National Health Service organisations working in partnership to deliver research to improve services for patient benefit.[15] As part of a service evaluation study of a new home birth service, we gathered interview, focus group and documentary data. We then compared the speed and outputs of rapid and traditional techniques applied to the same dataset. For the Rapid Analysis (RA) we used the approach developed by Hamilton at UCLA.[11] We compared this with Thematic Analysis (TA)[16] and the Framework Method which was selected due to the team's existing familiarity with this approach, and the fact that it is increasingly applied in multidisciplinary health services research.[6, 17]

METHOD

This study compares rapid and traditional analyses of a UK health service evaluation dataset, to explore differences in researcher time, and consistency of outputs. This was a mixed methods study, quantitatively and qualitatively comparing the outputs of qualitative methods.

SETTING

The data came from a home birth service evaluation study in a hospital in the English National Health Service which took place between October-December 2014.

Characteristics of participants

Home birth midwives (6), midwifery support workers (4), commissioners (4), managers (6), and community midwives (12) and a patient representative (1) participated in the original study.

Description of processes, interventions and comparisons

In the original evaluation, an evaluability assessment approach was adopted,[18] and its specific objectives were to: establish the original programme design and how the service differed from this design and why; identify facilitators or barriers to implementation; establish what service data are available, and how it is being /could be gathered; identify how staff would develop/improve the service.

Twenty three provider and commissioning staff and one patient representative were purposively sampled, with recruitment by direct email or telephone invite, with three unable to take part due to availability. Semi-structured interviews informed by the study objectives were conducted by [researcher 1] at participants' workplaces. A focus group of 12 staff was facilitated by [researcher 1] and [researcher 2], also structured according to the study objectives. A convenience sampling approach was taken for the focus group, with midwives available at the allotted time invited to take part at their workplace. Participants were not known to researchers prior to the study. Focus groups lasted approximately one hour, were digitally recorded and transcribed for analysis, with minimal field notes taken. Participants did not review transcripts. Eight key service documents were also utilised in the analysis (business case, service guidelines, commissioning policy). The primary service review and secondary analysis were reviewed by the University of Birmingham Ethics Committee, ref ERN_15-0127S. Local approval was obtained from the hospital Research and Development Team. The data was analysed independently using firstly RA and secondly TA as described in detail below. All researchers work in applied health research in the same department of a UK University.

Researcher 1 is a public health physician, Researcher 2 is a registered nurse, Researcher 3 is a registered midwife. Researchers 4 and 5 are health service researchers, Researcher 6 is a medical sociologist. A summary and comparison of the process used for the two analyses is shown in Table 1.

The primary Rapid Analysis (RA) *([researcher 1], [researcher 2], [researcher 3]))*

RA was conducted between November and December 2014. The rapid qualitative analysis approach used[11] was designed to deliver timely findings with methodological rigour. The approach includes guidance on data collection and report writing and was developed using teams of less experienced researchers. Here we have used only the analytical methodology and researchers experienced in qualitative methods. Hamilton relates how the reduced timeframe of rapid methods means that they tend to be more deductive and explanatory than inductive and exploratory.[11] However, the work presented here utilised both inductive and deductive approaches. The process is presented in detail in Table 1. Researchers spent approximately one hour with each transcript or document, noting key issues in a one-sheet, structured 'summary template' (Supplementary File 1). Summarised data was explored with respect to the research objectives, to produce a report summarising findings and recommendations.

Secondary Thematic Analysis using the Framework Method (TA) *([researcher 4], [researcher 5], [researcher 6])*

The secondary analysis was conducted by [researcher 4] between June and September 2015, after the original RA was complete, with oversight and support from [researchers 5 and 6]; all three are experienced qualitative applied health researchers from outside of the original team. Typically, the purpose of secondary analysis is to explore new research questions,[19]but in this case secondary analysis was performed using a different method to meet the same objectives as the primary analysis, to compare the outputs of the two methods. The original team ([researchers 1, 2 and 3]) provided brief contextual details about the field, the organisations and participants involved, and the

196 background to the project. No further discussion occurred, to avoid revealing RA findings to the TA
197 team. The TA was informed by the original research objectives, using an inductive approach, and
198 following the steps set out in the Framework Method:[6, 17] familiarisation, coding, developing a
199 framework, applying the framework, charting data into the framework, interpreting data, and
200 writing up. Table 1 summarises the process.

201

202 **Table 1: Description of the Rapid Analysis and Thematic Analysis**

	Rapid Analysis	Thematic Analysis
The researchers	Clinical background Embedded in the field First time using RA Shared office, opportunity to interact Evenly shared workload Main focus of work Conducted over short period Focused on producing and 'crafting' outputs for known stakeholders	Not clinical No prior exposure to field Experienced in TA – no need to 'learn' No informal interaction/reflection [Researcher 4] conducted most of the analysis Conducted alongside other core work Project delivered over a longer period Less focused on the needs and expectations of stakeholders
Data collection	Interviews, focus groups conducted, documents gathered from participants by [researcher 1], [researcher 2] facilitating focus group.	Provided with pre-gathered dataset.
Transcription	Audio recordings transcribed by third party. Transcripts checked for accuracy by researcher. Participant name retained in transcript	Pseudoanonymised transcripts and documents provided.
Timing	During and following data collection process.	Analysis conducted post-data collection.
Ordering	Interviews, then focus groups, then documents. Strategic participant data analysed first.	Documents, then interviews with strategic participants first , finally the focus groups
Early analysis	[researchers 1 and 2] dual analysed one interview transcript, inserting them into a 'summary template', organised according to the research objectives (see Supplementary File 1). They compared template content. The process and the template structure were reviewed and amended (some subheadings applied). A second transcript was subsequently dual analysed in the same way. The 'one hour per transcript' rule was not applied here,	A sample of transcripts reflecting a range of job title and seniority were analysed independently by [researchers 4 and 5] and the themes that emerged discussed and finalised. These themes were arranged into analytical hierarchies and formed the basis for the codification of the remaining data.

	spending 1.5-2 hours on each.	
Main analysis	Remaining data items allocated equally to [researchers 1 and 2], following the same process, limiting time to one hour maximum per data item (less for some less complex documents). Researcher entered information directly into a matrix, structured as the template, using individual templates duplicated work.	[Researchers 4 and 5] independently analysed the same three transcripts and the resulting themes and sub-themes were agreed and formed the analytical hierarchy for the remaining data.
Researcher interaction	[Researchers 1, 2 and 3] reflected and discussed the data and interpretation on a regular, iterative basis	[Researchers 4 and 5] had several telephone and one face to face discussion.
Interpretation	[Researchers 1 and 2] reviewed content in one another's matrices, and combined them. Data were allocated equally to [researchers 1 and 2] for interpretation and write up, organised according to the template, e.g. facilitators to implementation. The 'barriers' section was more complex, and this was subdivided it into themes which were allocated to [researchers 1 or 2], e.g. training, promotion and recruitment. A summary of findings and a set of recommendations were produced for each. Summaries were reorganised thematically.	[Researcher 1] undertook interpretation and write-up of the findings according to the thematic headings. For each theme and sub-theme an explanatory sentence was produced and an exemplar quote or quotes was selected. These themes and sub-themes were used to create a list of findings specific to each overarching theme.
Final report writing	Summaries of findings and recommendations were combined and checked by [Researchers 1, 2 and 3] to eliminate duplication and reach consensus regarding interpretation, revisiting the primary data where necessary.	These findings were used to inform a final report, populating the template provided by [researcher 1]. The report included a logic model and focused on a series of recommendations for the mitigation of existing issues where the service was failing.

The comparison

The comparative analysis was conducted between October 2015 and May 2016, comparing three aspects of the analyses: time taken, findings, and recommendations. Each team recorded the time taken to perform every activity. Summary statistics were produced using data from the resulting timesheets. Findings we defined as individual issues identified and included in a report. Recommendations were defined as suggested actions to improve or maintain the service. Each team then independently compared RA and TA findings, allocating a 'match', 'partial match' or 'mismatch'

category. Both teams then met to discuss and reach consensus. Any mismatches were discussed, and perceived reasons agreed and recorded and summary statistics produced.

RESULTS

The research teams

Table 2 presents the characteristics of the two research teams.

Table 2: Characteristics of the two research teams

Rapid Analysis Researchers	Thematic Analysis Researchers
Clinical	Lead researcher not clinical
Embedded in field	No prior exposure to the field
BT collected the data	Did not collect data
Using Rapid Analysis for first time – developing new practice	Experienced in Thematic Analysis, using existing skills
Shared office	No shared space
Equal workload within team	IL conducted majority of analysis
Analysis main task at work	Analysis conducted alongside other commitments
Focused on producing outputs for known stakeholders	Much less focused on the stakeholder team

Comparison of time

Table 3 illustrates the time taken at each stage of the process. The four hours of background discussions to provide IL with context were not counted in the total.

The RA data review and management took around a third of the time of the TA (43 hours and 116.5 respectively). The reverse was true of the report writing, RA was more than six times longer at 52 hours.

Comparison of findings

The comparison of findings is presented in Table 4. TA elicited marginally more findings than RA (153 v 131). There were 107 matches (example provided below). There are differences in reporting style and level of detail in the findings (explored further in the discussion).

"There are issues around communication with ambulances/paramedics." TA finding

"Some paramedics are unaware that the HBS exists and there have been delays of up to 30 minutes between the paramedics being informed of a BBA and this being cascaded down to midwives." RA finding

Findings from one method frequently matched two or more from the other: 71 RA and 78 TA findings delivered 107 matches. There were 43 partial matches, where findings identified similar, but not identical issues (28 RA, 37 TA, some matching more than once), for example:

"There was a general consensus that useful meetings with a range of stakeholders were hard to arrange for a number of reasons including workload and shift pattern." TA finding

"While support is strong in-principle, there is no formal process for strategic-level consultation and decision-making about the HBT within the provider Trust (outside of the Project Board). In addition, busy workloads make collaborative working challenging." RA finding

Eighty findings could not be matched: 46 or 37% of all RA findings, and 34 (21%) of the TA findings. Exploration (see Table 5) revealed that the most common reason for mismatches was that the other team simply did not identify it in the data (confirmed by returning to the original data). The TA team did not find 11%, and the RA team did not find 12% of the opposite team's findings. The next most

common reason was that findings were specific or detailed, rather than key issues with broad relevance. The RA team also reported positive findings which the TA team did not deem useful.

There were a small number of findings which emerged from interpretation of 'what was not in the data'. For example, the RA team reported that staff may not gain necessary qualifications for deployment, which was a risk to service resilience, connecting data on staff training with other data concerning service staffing requirements, rather than a direct report from research participants. The TA team did not identify this finding.. The RA team's contextual knowledge meant that they perceived some TA findings to be incorrect. For example, a TA finding suggesting that regular meetings were helpful was rejected, as the RA team had been informed (outside of the formal data collection) that the meetings were not functioning as intended.

Finally, the RA team unconsciously suppressed two findings that were politically challenging. For example, confusion regarding role boundaries among participants was a TA finding that RA researchers reflected they had suppressed.

Some findings appeared to have no match, but cross checking revealed that the finding aligned with the other team's recommendations (9 RA and 3 TA findings). For example, the RA found that staff had requested more emergency training, and the TA recommendations included provision of more emergency training.

Table 3: Time taken to complete analysis using rapid analysis and thematic analysis

	Rapid analysis team				Thematic analysis team			
		[R1]	[R2]	Total		[R4]	[R5]	Total
Primary data review and management	Review 2 transcripts and develop summary template	6	5	11	Review/code initial transcripts	11	10	20.5
	Refine template	2	2	4	Developing framework	3	1	4

	Complete summary template for remaining transcripts	13	11	24	Review/code remaining transcripts	82		82
	Reviewing documents	2	2	4	Reviewing documents	4		4
	Reviewing matrix	2	3	5	Final themes	8		8
	Total	25	23	48	**Total**	108	11	118.5
Interpretation and report writing	Writing up findings	16	16	32	Writing up findings	4		4
	Writing recommendations	8	12	20	Writing recommendations	4		4
	Total	24	28	52	**Total**	8	0	8
TOTAL				100				126.5

Table 4: Quantitative comparison of findings and recommendations elicited using rapid analysis and thematic analysis

		Rapid analysis		Thematic analysis		Total
Findings	**Matched**	71	54%	78	51%	107
	Partially matched	28	21%	37	24%	43
	No match found	48	37%	32	21%	80
	Appears in other team's recommendations (not findings)	9	7%	3	2%	12
	Total*	131		153		N/A
Recommendations	**Match**	18	28%	32	34%	32
	Partial match	20	31%	26	28%	26
	No match	26	41%	42	45%	68
	Total*	64		93		N/A

*This does not reflect column total as findings/recommendations from one team frequently matched (fully or partially) two or more from the other team

Comparison of recommendations

Quantitative comparison of recommendations is presented in Table 4. The RA generated 64 recommendations, a third less than the TA. 18 of the RA recommendations matched to 32 of those from the TA, for example:

"Require future recruits to have achieved the minimum numeracy/literacy standard."

TA recommendation

"Be clear on the necessary baseline skills in numeracy and literacy that are required."

RA recommendation

There were partial matches between 20 RA and 26 TA recommendations, for example.

"Ensure robust lines of communication are in place between Home Birth Service and community midwives." TA recommendation

"Routinely feed back to referring professionals to confirm booking with Home Birth Service, or transfer back to community midwives." RA recommendation

A further 26 (41%) of the RA recommendations, and 42 (43%) of the TA recommendations had no match. Reasons are presented with examples in Table5.

The most common reason was that the other team did not identify a particular recommendation, RA did not find 18 (35%) and TA did not find 3 (12%). Four of these TA recommendations related to training of midwives, three were about organisation of meetings, and the remainder had no common theme. The researchers determined that the midwife training recommendations were important, and had been an analytical blind spot for the RA team. Other mismatched

recommendations were collectively determined to be of low importance by the researchers, except for the TA team's recommendation about projected milestones for the service.

The RA team made 19 recommendations based on 'what wasn't in the data', interpreting beyond the reported facts. The TA team made 15 recommendations which the RA team did not support, as their contextual knowledge deemed them unworkable or inappropriate. Nine recommendations that were not found were from the TA team who made a detailed list of items for a future service dataset while the RA team provided less specific recommendations regarding a future data set. Finally, four recommendations were determined to be made due to contextual knowledge of the RA researchers.

Table 5: suggested reason for mismatched findings and recommendations, with examples

	Suggested reason for other team not eliciting finding/recommendation	Rapid analysis	Thematic analysis	Total	Examples
Findings	Straightforward miss/error	16	17	33	"There has been no Audit against NICE guidelines for contact (number of visits)." - TA
	Specific/detailed	10	11	21	"Aromatherapy oils are expensive." TA
	Positive finding not reported	15	0	15	"Initial engagement visits to community teams by HBT members facilitated implementation." RA
	Finding emerged from 'what is not in the data' - higher level interpretation	5	1	6	"It is not known whether current MSW recruits will be successful in the 45 credit [training] module, and how Service needs will be met if they are not." RA
	The embedded team's knowledge of the context meant they did not agree	0	3	3	Examples suppressed as sensitive
	Suppressed as politically challenging	0	2	2	Examples suppressed as sensitive
	Total	**46**	**34**	**80**	
Recommendations	Straightforward miss/error	3	18	21	"Ensure that meetings are attended by as many of full and part-time workers as possible." TA
	Recommendation emerged from 'what is not in the data' - higher level interpretation	19	0	19	"Consider whether services which fall outside of 'standard' maternity care should be routinely offered, e.g. complementary therapies, hypnobirthing, pool provision, high frequency or duration of contact with women." RA
	Embedded RA team's contextual knowledge meant that they did not agree with recommendation	0	15	15	"Co-locate the HBS with other maternity services." TA – the RA team knew that this was not possible at the participating hospital trust.
	Specific/detailed recommendations for a service dataset or audit	0	9	9	"Frequency of texts between mother and midwives could be retrospectively collated to demonstrate improved accessibility." TA
	Contextual knowledge was used to develop recommendation	4	0	4	"Ensure that the HBT midwives are sufficiently familiar with Birth Centre/Delivery Suite facilities and protocols." RA – the TA team assumed this would be the case already
	Total	**26**	**42**	**68**	

DISCUSSION

Principal findings

This study compared rapid and thematic analysis methods applied to the same dataset, to explore whether RA provides timely, accurate outputs for services. RA data management took around a third of the time of TA (43 v 116.5 hours). RA took 100 hours, and TA 126.5 hours in total, but RA interpretation and write up took more than 6 times longer than TA (52 v 8 hours). RA findings accounted for 79% of those from the TA, and TA accounted 63% of the RA findings. RA recommendations accounted for 55% of those from the TA, and TA accounted for 59% of the RA recommendations.

Strengths and limitations of the study

Strengths and limitations in the RA and TA processes

The qualitative analysis processes followed by each team have been described in detail to enhance reproducibility and reliability. The characteristics of the researchers are acknowledged and explored. Researchers were similar in that they were all experienced postdoctoral health services researchers, working in the same Institute for some time, arguably with similar culture. There were differences between the researchers (see Table 5). These factors may have conferred variation in analysis and interpretation.

The RA team had greater contextual knowledge resulting from previous clinical exposure as health professionals, and working closely with the service. This appeared to impart an underlying level of understanding that was critical to the findings and particularly recommendations. RA in a health service setting without this background knowledge may be inappropriate. Around a third of RA findings were not accounted for by the TA:RA generated a large number of additional findings,

suggesting that closeness to the field and data may have conferred an advantage. It has been recommended previously that contextual information should be provided to secondary analysts to mitigate the lack of exposure to the field.[19] The intended comparison of methods and need to avoid conferring between teams meant that the TA only received brief information, rather than the rich, iterative contextual information that may be more typically provided within secondary analysis.

The RA was conducted for a specific group of stakeholders, and the interpretation, and crafting of findings and recommendations was done with these individuals in mind. Though not conscious of this at the time of analysis, on reflection we believe that this focus on a specific audience, in addition to [researchers 1 and 2]'s relationship and sense of reciprocity with the service, may have resulted in a more lengthy approach. This contrasts with the TA which was a 'desktop exercise', with no commitment to the research participants, which we feel made the process more straightforward, with less need for careful presentation of data.

A second factor in explaining the lengthy RA is that it is the first time that [researchers 1 and 2] have used RA. Adapting to a new method can take time and discipline is required not to refer to more familiar, lengthier practices. However the number and detail in the findings and recommendations in the RA (131, 62 respectively) was similar to those in the TA (153, 93). For qualitative researchers trained in TA it may be difficult to wholly adopt the brevity required of RA.

The TA was predominantly conducted by one researcher [researcher 4], providing fewer opportunities for reflection in the TA development. The RA team also had the opportunity for ongoing regular reflection due to shared office space, which may have enhanced but also lengthened the process.

Our approach to this work was pragmatic, based on available researcher capacity, though in future comparisons parity across the RA and TA researchers could be achieved by using two equal-sized teams, with similar characteristics, and equal division of labour. Involving some or all of both teams in data collection would provide equality in exposure and embeddedness.

Strengths and limitations in the comparison process

This paper has provided an opportunity to explore and reflect on approaches to comparing qualitative methods. The limited evidence base necessitated the development of the comparison methodology. The study team regularly met to review the process, emerging findings and interpretation to enhance the rigour of the exercise.

The complexity of the process only became clear once the researchers began to compare the data. Differences in style and the degree of 'polishing' of the content and language, and the resulting impact on time taken, was not apparent until analyses were complete and outputs shared. In addition, devising an approach to categorising and reporting mismatched findings and recommendations took time and was not as intuitive.

A further limitation is the fact that the comparison was conducted by the researchers themselves, due to pragmatic resource constraints. While we acknowledged this and aimed to maintain objectivity, there is clearly a risk of bias in interpretation, and future projects should consider involving an independent, blinded third party to conduct the comparison.

An unexpected outcome of this study is that it has encouraged us to reflect deeply on our own research practice, resulting in a better understanding of our methods and role. Future comparisons may benefit from independent exploration of the researchers' individual processes alongside the 'outcomes' of time, findings and recommendations.

The initial intention was to involve participants in reviewing the importance of mismatched findings and recommendations. This was not practicable due to the unexpected length of time taken to complete the comparison, and the need for service stakeholders to determine whether mismatches would have been helpful many months in the past.

It is important to note that all researchers in this study were experienced in qualitative health research using TA, and as such this study does not explore RA and TA for novice researchers.

Possible explanations for the differences in time taken to conduct analysis

The time taken in the RA was much shorter at the data review and management stage, equating to around two weeks less whole time equivalent (WTE) researcher time. This suggests that managing data in this way within a short timeframe is possible. However, the interpretation and reporting phase was much longer with RA (6.5 days versus one day in TA). A number of factors may have contributed. Time saved in coding and data management may result in more time being required at the interpretation stage in RA. This needs further exploration, RA only took three WTE researcher days less that TA, which may be of little benefit to academic or health service stakeholders. There are further possible explanations: the researchers' relationship with the service, the purpose of the research, and the fact that the RA team were learning a new skill. This is explored earlier in the strengths and limitations section.

Possible explanations for the difference in findings

The RA findings accounted for 78 of the 153, or 79% of the findings delivered by the TA. This considerable overlap indicates that TA, which codes all data, did not produce many additional findings. This is consistent with others' findings comparing themes generated from different analytical approaches.

The most common reason for mismatches in findings was that the researchers had not identified the issue in error, with a 'did-not-find rate' of around one in ten for both methods. This may indicate that qualitative researchers will never elicit perfectly overlapping findings, regardless of method.

A number of mismatches were accounted for by unconscious suppression of challenging findings, higher level interpretation, and differences in contextual knowledge leading to the rejection of findings. These explanations were more prevalent in the RA team, suggesting that embeddedness influences these processes (discussed earlier as a limitation). Between a quarter (RA) and a third (TA) of the mismatched findings were somewhat detailed, highlighting differences in natural reporting style, interpretation and prioritisation of what was meaningful. Again, this may arise between different researchers, regardless of method. Mays and Pope relate how observations are "*limited by definition to the perceptions and introspection of the investigator*,"[20] and variations in perception and introspection are inevitable between different individuals. There are different views regarding whether qualitative findings should be reproducible,[21] but we take the stance that subjectivity and individual variation make this impossible. This has been a useful exercise in reflexivity, demonstrating how experiences and unconscious processes impact on findings.

The TA team did not report positive findings, accounting for a further portion of the mismatch: this was attributed to differences in interpretation of the project scope, rather than analytical processes delivering different results. Also the TA team were aware that they would not be presenting findings to providers, meaning that they felt more able to be critical and candid.

Possible explanations for the difference in recommendations

The recommendations also demonstrated overlap, with around three out of five being accounted for by both teams. However, RA did not pick up a third of the TA recommendations. We perceive that

the majority reflected relevant but non-essential detail, and the 'make or break' recommendations that were key to the sustainability of the service were not missed, though we acknowledge that this is a subjective judgement. Arguably the most important recommendation missed related to training midwives in administrative and management skills. This detail is consistent with the TA process, where the data was explored in more depth, leading to more precise recommendations. However, this pattern was not observed in the findings. A possible explanation is that the RA team, with the eventual audience in mind, were more conservative in the number and detail of recommendations. Over half of RA recommendations that the TA did not find were accounted for by higher level interpretation and contextual knowledge, and just under half of the TA mismatched recommendations were deemed inappropriate by the RA team due to contextual knowledge, suggesting that embeddedness in the field confers advantages, separate from the method used.

CONCLUSION

This paper provides important insights into the time taken and outputs from rapid and thematic qualitative analysis approaches. We found that the RA was appropriate and delivered valid findings and recommendations, with reassuring but not complete overlap, with mismatches appearing to relate to minor or detailed issues. RA enabled considerable time savings in management of data, but may not be as rapid as assumed. This requires further testing, addressing the limitations identified, to establish how much time experienced RA researchers can save, and whether this is of practical benefit to services. Further work is also required to determine whether differences in outputs are due to the analytical method, or other influences, and whether any differences are relevant and of importance to stakeholders. The characteristics, conduct, and role of the researcher/s is key, and our impression is that RA requires the researchers to be embedded in the field.

We do not advocate RA for granular exploration of complex questions, for example individuals' experience of phenomena. It could be used to rapidly identify issues for further, in depth qualitative exploration. RA represents one of many tools of the qualitative researcher's trade, with particular potential for use in applied health research, when timely reporting is needed. We advocate further work to identify the practical application and use of different rapid approaches in practice.

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COMPETING INTERESTS

Competing interests: All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

AUTHORS' CONTRIBUTIONS

The original idea for the project was conceived by SK. The study was designed by BT with intellectual input from all authors. Primary data collection was conducted by BT. Rapid analysis of data was conducted by BT and CH, with input from SK. Thematic analysis of data was conducted by IL and LB, with input from SG. Comparison of time data was conducted by BT, and checked by CH and IL. Initial comparison of findings and recommendations was conducted by BT, CH, IL and SK, and all authors reviewed outputs from the comparison. The preliminary draft of the paper was written by BT. This was critically reviewed by CH, IL, SG and SK for important intellectual content and subsequent revisions to the paper were undertaken by BT as a result. Final approval of the version of the paper to be published was granted by BT, CH, IL, SG and SK, who all also agreed to be accountable for all aspects of the work in ensuring that questions relating to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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DATA SHARING

Data is securely stored at the University of Birmingham in line with our information governance and data protection policies. Due to the confidential nature of our qualitative data, which may identify individuals even following anonymization, we have not made the data publicly available, in line with our research permissions and consent.

LIST OF ABBREVIATIONS

RA – Rapid Analysis

TA – Thematic Analysis

CLAHRC – Collaborations for Leadership in Applied Health Research and Care

MSW – Midwifery Support Worker

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Summary Template

Home Birth Service Exploratory Review Summary Template
PREPARED BY:
DATE:
DATA TYPE (document, interview transcript, focus group transcript):
FOR INTERVIEWS AND FOCUS GROUPS: ***PARTICIPANT IDENTIFIER/S*** ***PARTICIPANT ROLE*** ***PARTICIPANT ROLE IN THE HBS***
FOR DOCUMENTS: **TITLE** **DATE OF PRODUCTION** **AUTHOR**
RATIONALE FOR IMPLEMENTING HBS (POLICY, EVIDENCE, OTHER) **What was the problem, what was going wrong?** **What was the vision** (envisaged outputs, outcomes, impact)
TRAINING:
PROGRAMME THEORY/LOGIC MODEL: ***INPUTS*** *(resources, people)* ***ACTIVITIES*** *(what workers do, e.g. promotional work, clinical care)* ***OUTPUTS*** *(what activities deliver, e.g. women informed about the HBS, women receive intrapartum care at home)* ***and OUTCOMES*** *(results of the outputs, e.g. women book with the HBS, women give birth at home)* ***IMPACT/GOAL*** *(overall aims of programme, e.g. home birth booking rate increases, home birth rate increases)*
FACILITATORS of IMPLEMENTATION Planning/process People Culture Money Organisation/bureaucracy Evidence/policy Other
BARRIERS TO IMPLEMENTATION AND SOLUTIONS Planning/process People Culture Money Organisation/bureaucracy Evidence/policy Other
ROUTINELY GATHERED DATA (HOW,WHERE, WHEN, WHO COLLECTED, WHERE DATA HELD)
KEY DOCUMENTS WE SHOULD INCLUDE (e.g. service specification)
OTHER IMPORTANT OBSERVATIONS
IMPORTANT QUOTATIONS
REFLECTIONS ON THE DATA COLLECTION EPISODE

BMJ Open

Can rapid approaches to qualitative analysis deliver timely, valid findings to clinical leaders? A mixed methods study comparing rapid and thematic analysis

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Can rapid approaches to qualitative analysis deliver timely, valid findings to clinical leaders? A mixed methods study comparing rapid and thematic analysis

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ABSTRACT

Objectives: This study compares rapid and traditional analyses of a UK health service evaluation dataset, to explore differences in researcher time, and consistency of outputs.

Design: Mixed methods study, quantitatively and qualitatively comparing qualitative methods

Setting: Data from a home birth service evaluation study in a hospital in the English National Health Service which took place between October-December 2014. Two research teams independently analysed focus group and interview transcript data: one team used a Thematic Analysis approach using the Framework Method, and the second used Rapid Analysis.

Participants: Home birth midwives (6), midwifery support workers (4), commissioners (4), managers (6), and community midwives (12) and a patient representative (1) participated in the original study.

Interventions: None

Primary outcome measures: Time taken to complete analysis in person hours; analysis findings and recommendations matched, partially matched, or not matched across the two teams.

Results: Rapid Analysis data management took less time than Thematic Analysis (43 v 116.5 hours). Rapid Analysis took 100 hours, and Thematic Analysis 126.5 hours in total, with interpretation and write up taking much longer in the Rapid Analysis (52 v 8 hours). Rapid Analysis findings overlapped with 79% of Thematic Analysis findings, and Thematic Analysis overlapped with 63% of the Rapid Analysis findings. Rapid Analysis recommendations overlapped with 55% of those from the Thematic Analysis, and Thematic Analysis overlapped with 59% of the Rapid Analysis recommendations.

Conclusions: Rapid Analysis delivered a modest time saving. Excessive time to interpret data in Rapid Analysis in this study may be due to differences between research teams. There was overlap in outputs between approaches, more in findings than recommendations. Rapid Analysis may have the potential to deliver valid, timely findings while taking less time. We recommend further comparisons using additional data sets with more similar research teams.

Keywords

Qualitative Research

Health Services Administration & Management

Maternal Medicine

Strengths and limitations of this study

- Our study explores a strategy to address the time-lag in reporting qualitative findings to clinicians and policymakers, which slows translation of research into practice.
- This is the first comparison of qualitative analytical methods in applied health research which compares both researcher time *and* outputs, with a complete study dataset.
- The work describes the process of comparing time and analytical outputs in detail, to inform others planning further methodological comparisons.
- Due to the time lag in thematic analysis outputs, our study did not triangulate findings with the original participants.
- The study uncovered important challenges in comparing analytical approaches between research teams which can inform the design future work in this area.

BACKGROUND

Applied health research frequently adopts mixed methods, often using qualitative approaches.[1] Applications of qualitative methods include: early work to identify areas for focus; throughout a study to explore processes and user experience; following a trial or intervention implementation to explain outcomes and/or identify stakeholder experiences, to explore in more depth questions or issues identified through quantitative work; to problematise or 'unpack' issues or topics taken for granted.[2] Increasingly this type of research can include a broader range of contributors, for example where members of the public, patients, clinicians, and researchers are involved in analysing and interpreting data to ensure a multi-disciplinary perspective, or pragmatically using several researchers to code data in the interests of time.[3, 4]

Typically stakeholders want rapid results,[5-7] yet compared with quantitative approaches, traditional qualitative approaches often considerable time is required to manage and interpret data, and deliver findings.[8, 9] In a service context, delays may render the findings out of date, reducing their applicability and relevance. There are examples of apparently more rapid alternatives to traditional qualitative approaches, including specific end-to-end approaches such as Rapid Assessment Process and Rapid Ethnography.[6, 9-13] There are four broad areas where time can be saved; by reducing data collection time, for example by allowing less time between data collection episodes;[6] by reducing data management time, for example by relying on untranscribed audio recordings, notes, summaries and mind maps;[10-12] by minimising the time spent analysing data by summarising as opposed to formally coding;[11, 13] by limiting the time spent on analysis by using a 'one sheet of paper' summary to explore a sample of a large pre-coded dataset.[9] Often rapid methods describe a broad approach, including activities from entering the field through to delivery of findings, and/or involve mixed methods.[6, 7] This paper specifically explores whether rapid *analysis* of qualitative data (distinct from end-to-end rapid methods) delivers equivalent findings to traditional approaches, and how much time may be saved in practice.

There are a limited number of studies that have compared different qualitative analytical techniques.[11, 14-16] In some of the empirical examples identified, methodologists have predominantly compared methods of data collection (e.g. interviews versus internet forums[14]), and focused on the number and content of codes rather than interpretation. Of the three examples identified that compare analytical approaches one used focus group data to compare thematic analysis of a partial dataset with mind-mapping of a full dataset.[11] While this paper provides minimal detail regarding the method of comparison, it reported differences in time taken to analyse the data, and in the number and presentation of codes. The second example compared software-assisted and constant comparative approaches to analysis describing differences in the frequency of codes and coding levels.[15] The third example compared analysis of focus group data directly from audio recordings, with thematic analysis of transcribed data, and found that themes generated were comparable.[16]

The work we present here was conducted as part of the Collaboration for Leadership in Applied Health Research and Care (CLAHRC) programme in the West Midlands of England. CLAHRC involves local teams across Universities and National Health Service organisations working in partnership to deliver research to improve services for patient benefit.[17] As part of a service evaluation study of a new home birth service, we gathered interview, focus group and documentary data. We then compared the speed and outputs of rapid and traditional techniques applied to the same dataset. For the Rapid Analysis (RA) we used the approach developed by Hamilton at UCLA.[13] We compared this with Thematic Analysis (TA)[18] and the Framework Method which was selected due to the team's existing familiarity with this approach, and the fact that it is increasingly applied in multidisciplinary health services research.[8, 19]

METHOD

This study compares rapid and traditional analyses of a UK health service evaluation dataset, to explore differences in researcher time, and consistency of outputs. This was a mixed methods study, quantitatively and qualitatively comparing the outputs of qualitative methods.

SETTING

The data came from a home birth service evaluation study in a hospital in the English National Health Service which took place between October-December 2014. This was a service innovation put into place by the hospital. A dedicated team of midwives was set up to provide antenatal, birth and postnatal care to women choosing to have a home birth, with the aim of providing a more reliable service, and increasing the local home birth rate.

Characteristics of participants

Home birth midwives (6), midwifery support workers (4), commissioners (4), managers (6), and community midwives (12) and a patient representative (1) participated in the original study.

Description of processes, interventions and comparisons

In the original evaluation, an evaluability assessment approach was adopted,[20] and its specific objectives were to: establish the original programme design and how the service differed from this design and why; identify facilitators or barriers to implementation; establish what service data are available, and how it is being /could be gathered; identify how staff would develop/improve the service. The evaluation was a qualitative study, involving interviews and focus groups with key participants involved in the home birth service.

Twenty three provider and commissioning staff and one patient representative were purposively sampled, with recruitment by direct email or telephone invite, with three unable to take part due to availability. Twenty one semi-structured interviews informed by the study objectives were

conducted by [researcher 1] at participants' workplaces. A single focus group of 12 midwives was facilitated by [researcher 1] and [researcher 2], also structured according to the study objectives. A convenience sampling approach was taken for the focus group, with midwives available at the allotted time invited to take part at their workplace. Participants were not known to researchers prior to the study. Interviews and the focus group lasted approximately one hour, were digitally recorded and transcribed for analysis, with minimal field notes taken. Participants did not review transcripts. Eight key service documents were also utilised in the analysis (business case, service guidelines, commissioning policy). The primary service review and secondary analysis were reviewed by the University of Birmingham Ethics Committee, ref ERN_15-0127S. Local approval was obtained from the hospital Research and Development Team. The data was analysed independently using firstly RA and secondly TA as described in detail below. All researchers work in applied health research in the same department of a UK University. Researcher 1 is a public health physician, Researcher 2 is a registered nurse, Researcher 3 is a registered midwife. Researchers 4 and 5 are health service researchers, Researcher 6 is a medical sociologist. A summary and comparison of the process used for the two analyses is shown in Table 1. The work was undertaken using a theoretically interpretive, generic qualitative approach across both teams.

The primary Rapid Analysis (RA) *([researcher 1], [researcher 2], [researcher 3]))*

RA was conducted between November and December 2014: this constituted the primary empirical work which was subsequently reported to the service. The rapid qualitative analysis approach used[13] was designed to deliver timely findings with methodological rigour. The approach includes guidance on data collection and report writing and was developed using teams of less experienced researchers. Here we have used only the analytical methodology and researchers experienced in qualitative methods. Hamilton relates how the reduced timeframe of rapid methods means that they tend to be more deductive and explanatory than inductive and exploratory.[13] It can be hypothesised that this may negatively impact on the ability of rapid methods to discover more

'hidden' phenomena which one associates with traditional qualitative methods, and this must be balanced with the speed at which rapid methods can deliver findings . In recognition of this, the work presented here incorporated both inductive and deductive approaches, using a deductive template to structure analysis, with explicit remit to highlight other issues which emerged inductively from the data, though the focus was on inductive analysis. The process is presented in detail in Table 1. Researchers spent approximately one hour with each transcript or document, as stipulated by Hamilton in her description of the approach, noting key issues in a one-sheet, structured 'summary template', with no formal coding. The data entered into the summary templates focused on the main issues in the data, rather than every single issue that surfaced. The RA summary template was made up of a number of sections describing participant and data collection details, and deductive and inductive headings. At the end of the template there were further sections to record key documents, observations, quotations, and reflections relating to the data collection episode. The deductive aspects of the initial summary template were developed from the research questions: rationale for implementing the home birth service, programme design (structured according to logic model domains), facilitators and barriers to implementation, and routinely gathered data about the service. This template was tested by both RA researchers as described in Table 1. During this early testing process it was deemed necessary to inductively develop a small number of additional subheadings for three of the template sections (rationale, barriers, facilitators), to help the researchers to organise the data. Although the use of more focused approaches has been highlighted to be of value when interpreting data for reporting in a health service context, the need to maintain a thorough and transparent process must go hand in hand with producing findings which are easily understood and relevant to stakeholders.[11] The summary template accompanies this paper (Supplementary File 1). Summarised data was explored with respect to the research objectives, to produce a report summarising findings and recommendations.

Secondary Thematic Analysis using the Framework Method (TA) *([researcher 4], [researcher 5], [researcher 6])*

The secondary analysis was conducted by [researcher 4] between June and September 2015, after the original RA was complete, with oversight and support from [researchers 5 and 6]; all three are experienced qualitative applied health researchers from outside of the original team. Typically, the purpose of secondary analysis is to explore new research questions,[21]but in this case secondary analysis was performed using a different method to meet the same objectives as the primary analysis, to compare the outputs of the two methods. The original team ([researchers 1, 2 and 3]) provided brief contextual details about the field, the organisations and participants involved, and the background to the project. No further discussion occurred, to avoid revealing RA findings to the TA team. The TA was informed by the original research objectives, using an inductive approach, and following the steps set out in the Framework Method, an approach to thematic analysis developed by Ritchie and Lewis:[8, 19] familiarisation, coding, developing a framework, applying the framework, charting data into the framework, interpreting data, and writing up. Table 1 summarises the process

Table 1: Description of the Rapid Analysis and Thematic Analysis

		Rapid Analysis	Thematic Analysis
The researchers		Clinical background Embedded in the field First time using RA Shared office, opportunity to interact Evenly shared workload Main focus of work Conducted over short period Focused on producing and 'crafting'* outputs for known stakeholders	Not clinical No prior exposure to field Experienced in TA – no need to 'learn' No informal interaction/reflection [Researcher 4] conducted most of the analysis Conducted alongside other core work Project delivered over a longer period Less focused on the needs and expectations of stakeholders
Epistemological position		Theoretically interpretive, generic qualitative approach	Theoretically interpretive, generic qualitative approach
Data collection		Interviews, focus groups conducted, documents gathered from participants by [researcher 1], [researcher 2] facilitating focus group.	Provided with pre-gathered dataset.
Transcription		Audio recordings transcribed by third party. Transcripts checked for accuracy by researcher. Participant name retained in transcript	Pseudoanonymised transcripts and documents provided.
Timing		During and following data collection process.	Analysis conducted post-data collection.
Ordering		Interviews, then focus groups, then documents. Strategic participant data analysed first.	Documents, then interviews with strategic participants first , finally the focus groups
'Data management and review' stage	Early analysis	[researchers 1 and 2] dual analysed one interview transcript, inserting them into a 'summary template', organised according to the research objectives (see Supplementary File 1). They compared template content. The process and the template structure were reviewed and amended (some subheadings applied). A second transcript was subsequently dual analysed in the same way. The 'one hour per transcript' rule was not applied here, spending 1.5-2 hours on each.	An identical sample of three transcripts reflecting a range of job title and seniority were analysed independently by [researchers 4 and 5] and the themes that emerged discussed and finalised. These themes were arranged into analytical hierarchies i.e. consisting of the key themes and associated sub-themes and these formed the basis for the codification of the remaining data.
	Main analysis	Remaining data items allocated equally to [researchers 1 and 2], following the same process, limiting time to one hour maximum per data item (less for some less complex documents). Researcher entered information directly into a matrix, structured as the	[Researchers 4] independently analysed the remainder of the transcripts and the resulting themes and sub-themes were agreed with [Researcher 5] and formed the analytical hierarchy for the remaining data.

		template, using individual templates duplicated work.	
'Interpretation' stage	Data interpretation	[Researchers 1 and 2] reviewed content in one another's matrices, and combined them. Data were allocated equally to [researchers 1 and 2] for interpretation and write up, organised according to the template, e.g. facilitators to implementation. The 'barriers' section was more complex, and this was subdivided it into themes which were allocated to [researchers 1 or 2], e.g. training, promotion and recruitment. A summary of findings and a set of recommendations were produced for each. Summaries were reorganised thematically.	[Researcher 1] undertook interpretation and write-up of the findings according to the thematic headings. For each theme and sub-theme an explanatory sentence was produced and an exemplar quote or quotes was selected. These themes and sub-themes were used to create a list of findings specific to each overarching theme.
	Final report writing	Summaries of findings and recommendations were combined and checked by [Researchers 1, 2 and 3] to eliminate duplication and reach consensus regarding interpretation, revisiting the primary data where necessary.	These findings were used to inform a final report, populating the template provided by [researcher 1]. The report template included the following headings: 1) Participants and data (not written up in secondary analysis) 2) Timeline for development of Service 3) Service design (logic models developed for intended and actual service design) 4) Achievements 5) Challenges 5.1) Barriers to implementing the model as intended 5.2) Barriers to delivering specific Service outcomes 6) Service data 6.2) Data being gathered 6.3) Responsibility for data collection/entry/analysis 6.4) What's going well in HBS data capture and use 6.5) Data-related challenges 7) Recommendations
Researcher interaction		[Researchers 1, 2 and 3] reflected and discussed the data and interpretation on a regular, iterative basis	[Researchers 4 and 5] had several telephone and one face to face discussion.

***'Crafting' refers to the writing and editing of findings and recommendations to present content and language deemed to be appropriate to the service stakeholders by the RA team**

Notes on methods used

It is important to acknowledge that the creative and flexible nature of qualitative methods means that there is variation in the way different researchers undertake even established methods. While we refer to the methods with proper nouns, and summarise as 'TA' and 'RA' to provide clarity for the reader, it should not be assumed that these methods are 'fixed'. In addition, while we refer to the Framework Method analysis as 'TA', we acknowledge that the Framework Method is one of many approaches that fall within thematic analysis.[8] We provide a full description of our approach for transparency. It should also be noted that while both methods use matrices, the approaches are quite different, in that TA involves the detailed, inductive coding of data, producing a detailed coding framework, and more complex matrix which accounts more completely for the dataset. RA focuses on major issues identified in the data, no full coding occurs, and matrices are deductively constructed.

The comparison

The comparative analysis was conducted between October 2015 and May 2016, comparing three aspects of the analyses: time taken, findings, and recommendations. Each team recorded the time taken to perform every activity. Analytical activities were divided into two broad areas: 'data review and management', and 'data interpretation and report writing', as indicated in Table 1. Summary statistics were produced using data from the resulting timesheets. Findings we defined as individual issues identified and included in a report. Recommendations were defined as suggested actions to improve or maintain the service. Each team then independently compared RA and TA findings, allocating a 'match', 'partial match' or 'mismatch' category. Both teams then met to discuss and reach consensus. Any mismatches were discussed, and perceived reasons agreed and recorded and summary statistics produced.

'Patient and Public Involvement'

This paper is a methodological exploration of two different means of qualitative analysis. There was no PPI involvement in establishing the criteria for comparison nor in facilitating the work. However PPI was intrinsic to the original programme from which the data was gleaned [17].

RESULTS

The research teams

Table 2 presents the characteristics of the two research teams.

Table 2: Characteristics of the two research teams

Rapid Analysis Researchers	Thematic Analysis Researchers
Clinical	Lead researcher not clinical
Embedded in field	No prior exposure to the field
BT collected the data	Did not collect data
Using Rapid Analysis for first time – developing new practice	Experienced in Thematic Analysis, using existing skills
Shared office	No shared space
Equal workload within team	IL conducted majority of analysis
Analysis main task at work	Analysis conducted alongside other commitments
Focused on producing outputs for known stakeholders	Much less focused on the stakeholder team

Comparison of time

Table 3 illustrates the time taken at each stage of the process, for the 'management' and 'interpretation and report writing' stages defined earlier in Table 1. The four hours of background discussions to provide IL with context were not counted in the total.

The RA data review and management took around a third of the time of the TA (43 hours and 116.5 respectively). The reverse was true of the report writing, RA was more than six times longer at 52 hours.

Comparison of findings

The comparison of findings is presented in Table 4. TA elicited marginally more findings than RA (153 v 131). There were 107 matches. There are differences in reporting style and level of detail in the matched findings, with the example below highlighting how each team provided similar findings, but with a varied degree of specific information. Both teams had examples where they provided more or less detail than the other on a specific topic, but the reporting style in the RA was consistently more 'polished', with findings more consistently framed in a way that would be more accessible to the intended audience (explored further in the discussion).

"There are issues around communication with ambulances/paramedics." TA finding

"Some paramedics are unaware that the HBS exists and there have been delays of up to 30 minutes between the paramedics being informed of a BBA and this being cascaded down to midwives." RA finding

Findings from one method frequently matched two or more from the other: 71 RA and 78 TA findings delivered 107 matches. There were 43 partial matches, where findings identified similar, but not identical issues (28 RA, 37 TA, some matching more than once), for example:

"There was a general consensus that useful meetings with a range of stakeholders were hard to arrange for a number of reasons including workload and shift pattern." TA finding

"While support is strong in-principle, there is no formal process for strategic-level consultation and decision-making about the HBT within the provider Trust (outside of the Project Board). In addition, busy workloads make collaborative working challenging." RA finding

Eighty findings could not be matched: 46 or 37% of all RA findings, and 34 (21%) of the TA findings. Exploration (see Table 5) revealed that the most common reason for mismatches was that the other team simply did not interpret the relevant finding from the data. The TA team did not find 11%, and the RA team did not find 12% of the opposite team's findings. The next most common reason was that findings were specific or detailed, rather than key issues with broad relevance. The RA team also reported 15 positive findings (successes and achievements) which the TA team did not include in a report to the Service: the TA team reflected that they focused on constructive feedback about challenges and areas requiring improvement, rather than positive findings (explored further in the discussion). For example, the RA team reported "The HBT MWs are generally supportive of the need for data collection and comply with this," and "The Service has produced its first comprehensive data report for the Project Board (November 2014)."

There were a small number of findings which emerged from interpretation of 'what was not in the data'. For example, the RA team reported that staff may not gain necessary qualifications for deployment, which was a risk to service resilience, connecting data on staff training with other data concerning service staffing requirements, rather than a direct report from research participants. The TA team did not identify this finding. The RA team's contextual knowledge meant that they perceived some TA findings to be incorrect. For example, a TA finding suggesting that regular meetings were helpful was rejected, as the RA team had been informed (outside of the formal data collection) that the meetings were not functioning as intended.

Finally, the RA team unconsciously suppressed two findings that were politically challenging: they agreed with these two findings from the TA team, which concerned relationships and performance of individuals connected to the Service (exact examples cannot be provided as they are of a sensitive nature). The RA team reflected that while they were aware of these issues, and also knew that the Service was aware of them, they did not write them up as findings in the report. This was not an actively documented, discussed decision-making process between the RA researchers: it was more implicit that they could not 'go there' in a report.

Some findings appeared to have no match, but cross checking revealed that the finding aligned with the other team's recommendations (9 RA and 3 TA findings). For example, the RA found that staff had requested more emergency training, and the TA recommendations included provision of more emergency training.

In terms of topics, the mismatched findings covered a range of different issues for the service. Both teams identified findings missed by the other team, which covered operational issues and leadership and management issues for the Service. The RA team identified findings that were not elicited by the TA team relating to strategic issues, promotion of the service, and performance management (which were often positive findings about 'successes' not reported by the TA team).

Table 3: Time taken to complete analysis using rapid analysis and thematic analysis

	Rapid analysis team				**Thematic analysis team**			
	Activity	Time taken (hours)			Activity	Time taken (hours)		
		[R1]	**[R2]**	**Total**		**[R4]**	**[R5]**	**Total**
Primary data review and management	Review 2 transcripts and develop summary template	6	5	11	Review/code initial transcripts	11	9.5	20.5

	Refine template	2	2	4	Developing framework	3	1	4
	Complete summary template for remaining transcripts	13	11	24	Review/code remaining transcripts	82		82
	Reviewing documents	2	2	4	Reviewing documents	4		4
	Reviewing matrix	2	3	5	Final themes	8		8
	Total	25	23	48	**Total**	108	10.5	118.5
Interpretation and report writing	Writing up findings	16	16	32	Writing up findings	4		4
	Writing recommendations	8	12	20	Writing recommendations	4		4
	Total	24	28	52	**Total**	8	0	8
TOTAL				100				126.5

Table 4: Quantitative comparison of findings and recommendations elicited using rapid analysis and thematic analysis

		Rapid analysis		Thematic analysis		Total
Findings	**Matched**	71	54%	78	51%	107
	Partially matched	28	21%	37	24%	43
	No match found	48	37%	32	21%	80
	Appears in other team's recommendations (not findings)	9	7%	3	2%	12
	Total*	131		153		N/A
Recommendations	**Match**	18	28%	32	34%	32
	Partial match	20	31%	26	28%	26
	No match	26	41%	42	45%	68
	Total*	64		93		N/A

*This does not reflect column total as findings/recommendations from one team frequently matched (fully or partially) two or more from the other team

Comparison of recommendations

Quantitative comparison of recommendations is presented in Table 4. The RA generated 64 recommendations, a third less than the TA. 18 of the RA recommendations matched to 32 of those from the TA, and the individual RA recommendations tended to bring together multiple issues, and were 'crafted' in such a way as to provide a smaller, number of recommendations combining multiple points. For example the RA recommendation below encompassed three separate TA recommendations:

Working model: urgently consult regarding whether the model (shift pattern/on call volume/accrued time) is fit for purpose, and if it is, how MWs can be supported to avoid burnout. In addition, consider whether the Service can realistically attend BBAs within this model, and if not how this key objective for the Service can be achieved. (RA recommendation)

Collect more precise data on which BBAs did or didn't need to attend. Then look at feasibility of HBS attending these women in the home. (TA recommendation 1)

Determine the capacity of current staffing levels and shift patterns. (TA recommendation 2)

Begin discussions with staff on preferences and flexibility in order to meet growing demand. (TA recommendation 3)

Some recommendations were more directly matched, for example:

"Require future recruits to have achieved the minimum numeracy/literacy standard."

TA recommendation

"Be clear on the necessary baseline skills in numeracy and literacy that are required."

RA recommendation

There were partial matches between 20 RA and 26 TA recommendations, for example.

"Ensure robust lines of communication are in place between Home Birth Service and community midwives." TA recommendation

"Routinely feed back to referring professionals to confirm booking with Home Birth Service, or transfer back to community midwives." RA recommendation

A further 26 (41%) of the RA recommendations, and 42 (43%) of the TA recommendations had no match. Reasons are presented with examples in Table5.

The most common reason was that the other team did not identify a particular recommendation, RA did not find 18 (35%) and TA did not find 3 (12%). Four of these TA recommendations related to training of midwives, three were about organisation of meetings, and the remainder had no common theme. The researchers determined that the midwife training recommendations were important, and had been an analytical blind spot for the RA team. Other mismatched recommendations were collectively determined to be of low importance by the researchers, except for the TA team's recommendation about projected milestones for the service.

The RA team made 19 recommendations based on 'what wasn't in the data', interpreting beyond the reported facts. The TA team made 15 recommendations which the RA team did not support, as their contextual knowledge deemed them unworkable or inappropriate. Nine recommendations that were not found in the RA recommendations were from the TA team who made a detailed list of items for a future service dataset while the RA team provided less specific recommendations

regarding a future data set. Finally, four recommendations were determined to be made due to contextual knowledge of the RA researchers.

Table 5: suggested reason for mismatched findings and recommendations, with examples

	Suggested reason for other team not eliciting finding/recommendation	Rapid analysis	Thematic analysis	Total	Examples
Findings	Straightforward miss/error	16	17	33	"There has been no Audit against NICE guidelines for contact (number of visits)." - TA
	Specific/detailed	10	11	21	"Aromatherapy oils are expensive." TA
	Positive finding not reported	15	0	15	"Initial engagement visits to community teams by HBT members facilitated implementation." RA
	Finding emerged from 'what is not in the data' - higher level interpretation	5	1	6	"It is not known whether current MSW recruits will be successful in the 45 credit [training] module, and how Service needs will be met if they are not." RA
	The embedded team's knowledge of the context meant they did not agree	0	3	3	Examples suppressed as sensitive
	Suppressed as politically challenging	0	2	2	Examples suppressed as sensitive
	Total	**46**	**34**	**80**	
Recommendations	Straightforward miss/error	3	18	21	"Ensure that meetings are attended by as many of full and part-time workers as possible." TA
	Recommendation emerged from 'what is not in the data' - higher level interpretation	19	0	19	"Consider whether services which fall outside of 'standard' maternity care should be routinely offered, e.g. complementary therapies, hypnobirthing, pool provision, high frequency or duration of contact with women." RA
	Embedded RA team's contextual knowledge meant that they did not agree with recommendation	0	15	15	"Co-locate the HBS with other maternity services." TA – the RA team knew that this was not possible at the participating hospital trust.
	Specific/detailed recommendations for a service dataset or audit	0	9	9	"Frequency of texts between mother and midwives could be retrospectively collated to demonstrate improved accessibility." TA
	Contextual knowledge was used to develop recommendation	4	0	4	"Ensure that the HBT midwives are sufficiently familiar with Birth Centre/Delivery Suite facilities and protocols." RA – the TA team assumed this would be the case already
	Total	**26**	**42**	**68**	

DISCUSSION

Principal findings

This study compared rapid and thematic analysis methods applied to the same dataset, to explore whether RA provides timely, accurate outputs for services. RA data management took around a third of the time of TA, but RA interpretation and write up took more than 6 times longer than TA. There was considerable overlap in the findings and recommendations between the two methods, with RA identifying marginally more findings than TA, and TA making marginally more recommendations than the RA. The comparison identified qualitative differences in the depth and detail of findings and recommendations in the two teams.

Strengths and limitations of the study

Strengths and limitations in the RA and TA processes

The qualitative analysis processes followed by each team have been described in detail to enhance reproducibility and reliability. However, we acknowledge that work of this nature can never be reproducible, due to the subjectivity of qualitative researchers and processes,[22] and the fact that research is a situated practice, where some aspects of the activity are beyond the control of the researcher.[23] In qualitative research there is much debate regarding subjectivity, reflexivity, and bias.[22, 24] In the conduct of our work we attempted to minimise 'bias' and described our methods in detail, though we have also retrospectively identified opportunities where others can mitigate this further in future work. The findings of research such as ours, which does reflect on and compare processes and findings in a systematic and detailed manner, can contribute to understanding the challenges faced by researchers.[25] The characteristics of the researchers are acknowledged and explored. Researchers were similar in that they were all experienced postdoctoral health services researchers, working in the same Institute for some time, arguably with

similar cultures, though we acknowledge that the human, interpretive nature of qualitative research means that standardisation or researchers within and between the teams is not possible. There were differences between the researchers (see Table 2). These factors may have conferred variation in analysis and interpretation.

The RA team had greater contextual knowledge resulting from previous clinical exposure as health professionals, and working closely with the service. This appeared to impart an underlying level of understanding that was critical to the findings and particularly recommendations. It is useful to think about the concept of research as a situated practice in the context of our work. This may be particularly relevant for researchers who are 'embedded' in some way within the service being researched. Whilst such embeddedness can help to provide useful insights into the meaning and relevance of research findings it is important to be aware that this may unconsciously influence data interpretation.[23] RA in a health service setting without this background knowledge may be inappropriate. Around a third of RA findings were not accounted for by the TA: RA generated a large number of additional findings, suggesting that closeness to the field and data may have conferred an advantage. It has been recommended previously that contextual information should be provided to secondary analysts to mitigate the lack of exposure to the field.[21] The intended comparison of methods and need to avoid conferring between teams meant that the TA only received brief information, rather than the rich, iterative contextual information that may be more typically provided within secondary analysis.

The RA was conducted for a specific group of stakeholders, and the interpretation, and crafting of findings and recommendations was done with these individuals in mind. Though not conscious of this at the time of analysis, on reflection we believe that this focus on a specific audience, in addition to [researchers 1 and 2]'s relationship and sense of reciprocity with the service, may have resulted in

a more lengthy approach. We reflected that it also resulted in more focus on reporting positive findings, or 'good news' in the RA team, and suppressing negative findings that concerned individuals, which the RA researchers deemed inappropriate to report in an evaluation output that would be widely shared. This contrasts with the TA which was a 'desktop exercise', with no commitment to the research participants, which we feel made the process more straightforward, with less need for careful presentation of data. This provides a clear example of researchers navigating the "politics of research", telling stories differently as a result of the different purpose and context of the research.[26]

A second factor in explaining the lengthy RA is that it is the first time that [researchers 1 and 2] have used RA. Adapting to a new method can take time and discipline is required not to refer to more familiar, lengthier practices. However the number and detail in the findings and recommendations in the RA (131, 62 respectively) was similar to those in the TA (153, 93). For qualitative researchers trained in TA it may be difficult to wholly adopt the brevity required of RA.

The TA was predominantly conducted by one researcher [researcher 4], providing fewer opportunities for reflection in the TA development. The RA team also had the opportunity for ongoing regular reflection due to shared office space, which may have enhanced but also lengthened the process.

Our approach to this work was pragmatic, based on available researcher capacity, and there was variation in researcher characteristics, in their programmes of existing work, and embeddedness in the field for this study, which may have impacted on the outputs from the work. In future comparisons, involving some or all of both teams in data collection would provide equality in exposure and embeddedness, and increasing similarity in researcher characteristics could provide further parity. The workload and capacity issues are more problematic. The time taken to

undertake analysis varies from project to project, based on the available time, deadlines, funding and competing priorities. Generally there is always scope for extended analysis of data to explore it further, and researchers must make pragmatic decisions about when analysis for a specific project is 'finished'. It is likely that there is variation between decisions to cease analysis between research teams, particularly in our comparison, where the analysis was a 'desk top exercise' for the TA team and a 'real' project with stakeholders expecting outputs from the RA team, meaning the latter may be more inclined to spend longer on the project. To mitigate this, increased parity across the RA and TA researchers could be achieved by using two equal-sized teams, with equal division of labour, and explicit allocation of capacity to the project. However, it is still impossible to standardise decisions regarding what constitutes 'enough' work on a dataset.

Strengths and limitations in the comparison process

This paper has provided an opportunity to explore and reflect on approaches to comparing qualitative methods. The limited evidence base necessitated the development of the comparison methodology. The study team regularly met to review the process, emerging findings and interpretation to enhance the rigour of the exercise. A mixed methods approach was undertaken in order to explore RA, which allows for a broader exploration of a phenomenon (the analytical process) than quantitative or qualitative methods alone.[27-29] However, the qualitative aspect was restricted to evaluation of the alignment content outputs of the research and description of the researcher characteristics and activity diaries by the researchers themselves. Future comparisons of methods could be strengthened with the addition of independent qualitative evaluation of the research processes and outputs. A limitation of the quantitative approach to comparing outputs from qualitative work is that it reduces findings and recommendations, directly comparing individual outputs which display different levels of depth and detail. It is important to highlight that 'more' does not necessarily equal 'better' in qualitative research outputs.

An important consideration when undertaking comparison of methods is the variation in processes between individual researchers. For example, while TA using the Framework Method follows an established process described in the literature, it is acknowledged that the complex nature of qualitative analysis, and the role of the researcher in the process, means that there will always be variation between researchers in the exact physical and cognitive processes involved. It is therefore not possible to 'standardise' between researchers, within or between the two methods being compared. Whilst we perceive comparisons of this nature to be worthwhile in order to develop and understand the applications of qualitative methods, they must include detailed description of and reflection upon the processes and researchers.

The complexity of the process only became clear once the researchers began to compare the data. Differences in style and the degree of 'polishing' of the content and language with the RA team 'crafting' findings and recommendations deemed sensitive and appropriate to be shared with stakeholders, and the resulting impact on time taken, was not apparent until analyses were complete and outputs shared. In addition, devising an approach to categorising and reporting mismatched findings and recommendations took time and was not as intuitive.

A further limitation is the fact that the comparison was conducted by the researchers themselves, due to pragmatic resource constraints. While we acknowledged this and aimed to maintain objectivity, there is clearly a risk of bias in interpretation, and future projects should consider involving an independent, blinded third party to conduct the comparison.

An unexpected outcome of this study is that it has encouraged us to reflect deeply on our own research practice, resulting in a better understanding of our methods and role. Future comparisons may benefit from independent exploration of the researchers' individual processes alongside the

'outcomes' of time, findings and recommendations. It is clear that there are a number of barriers which may constrain the research process in a service evaluation of the type we conducted. Greater reciprocal appreciation that these exist, and what they are, may help to facilitate discussions where there are unexpected or unpalatable research findings.[30]

The initial intention was to involve participants in reviewing the importance of mismatched findings and recommendations. This was not practicable due to the unexpected length of time taken to complete the comparison, and the need for service stakeholders to determine whether mismatches would have been helpful many months in the past.

It is important to note that all researchers in this study were experienced in qualitative health research using TA, and as such this study does not explore RA and TA for novice researchers.

Possible explanations for the differences in time taken to conduct analysis

The time taken in the RA was much shorter at the data review and management stage, equating to around two weeks less whole time equivalent (WTE) researcher time. This suggests that managing data in this way within a short timeframe is possible. However, the interpretation and reporting phase was much longer with RA (6.5 days versus one day in TA). A number of factors may have contributed. Time saved in coding and data management may result in more time being required at the interpretation stage in RA. This needs further exploration, RA only took three WTE researcher days less that TA, which may be of little benefit to academic or health service stakeholders. There are further possible explanations: the researchers' relationship with the service, the purpose of the research, the capacity of researchers, and the fact that the RA team were learning a new skill. This is explored earlier in the strengths and limitations section.

Possible explanations for the difference in findings

The RA findings accounted for 78 of the 153, or 79% of the findings delivered by the TA. This considerable overlap indicates that TA, which codes all data, did not produce many additional findings. This is consistent with others' findings comparing themes generated from different analytical approaches.

The most common reason for mismatches in findings was that the researchers had not identified the issue in error. In the RA, patterns and findings may have been missed as a result of the more deductive approach taken, and the reduced time spent with primary data. However, there was a 'did-not-find rate' of around one in ten for both methods, suggesting that this was not the case . The mismatches suggest that qualitative researchers will never elicit perfectly overlapping findings, regardless of method.

A number of mismatches were accounted for by unconscious suppression of challenging findings, higher level interpretation, and differences in contextual knowledge leading to the rejection of findings. These explanations were more prevalent in the RA team, suggesting that embeddedness influences these processes. Between a quarter (RA) and a third (TA) of the mismatched findings were somewhat detailed, highlighting differences in natural reporting style, interpretation and prioritisation of what was meaningful. Again, this may arise between different researchers, regardless of method. Mays and Pope relate how observations are "*limited by definition to the perceptions and introspection of the investigator*,"[31] and variations in perception and introspection are inevitable between different individuals. There are different views regarding whether qualitative findings should be reproducible,[32] but we take the stance that subjectivity and individual variation make this impossible. This has been a useful exercise in reflexivity, demonstrating how experiences and unconscious processes impact on findings.

The TA team did not report positive findings, accounting for a further portion of the mismatch: this was attributed to differences in interpretation of the project scope, rather than analytical processes delivering different results. Also the TA team were aware that they would not be presenting findings to providers, meaning that they felt more able to be critical and candid.

Possible explanations for the difference in recommendations

The recommendations also demonstrated overlap, with around three out of five being accounted for by both teams. However, RA did not pick up a third of the TA recommendations. We perceive that the majority reflected relevant but non-essential detail, and the 'make or break' recommendations that were key to the sustainability of the service were not missed, though we acknowledge that this is a subjective judgement. Arguably the most important recommendation missed related to training midwives in administrative and management skills. This detail is consistent with the TA process, where the data was explored in more depth, leading to more precise recommendations. However, this pattern was not observed in the findings. A possible explanation is that the RA team, with the eventual audience in mind, were more conservative in the number and detail of recommendations. Over half of RA recommendations that the TA did not find were accounted for by higher level interpretation and contextual knowledge, and just under half of the TA mismatched recommendations were deemed inappropriate by the RA team due to contextual knowledge, suggesting that embeddedness in the field confers advantages, separate from the method used.

CONCLUSION

We found that RA was appropriate and delivered valid findings and recommendations, with reassuring but not complete overlap. Mismatches appeared to relate to minor or detailed issues. RA enabled considerable time savings in data management , but may not be as rapid as assumed. Further work is needed, addressing the limitations identified, to establish how much time

experienced RA researchers can save, whether differences in outputs are due to the analytical method or other influences, and whether these are relevant and of practical benefit for stakeholders and to services. Researcher characteristics, conduct, and roles are key, and our impression is that RA requires the researchers to be embedded in the field.

We do not advocate RA for granular exploration of complex questions, for example individuals' experience of phenomena. It could be used to rapidly identify issues for further, in depth qualitative exploration. RA represents one of many tools of the qualitative researcher's trade, with particular potential for use in applied health research, when timely reporting is needed. We advocate further work to identify the practical application and use of different rapid approaches in practice.

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COMPETING INTERESTS

Competing interests: All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

AUTHORS' CONTRIBUTIONS

The original idea for the project was conceived by SK. The study was designed by BT with intellectual input from all authors. Primary data collection was conducted by BT. Rapid analysis of data was conducted by BT and CH, with input from SK. Thematic analysis of data was conducted by IL with input from SG. Comparison of time data was conducted by BT, and checked by CH and IL. Initial comparison of findings and recommendations was conducted by BT, CH, IL and SK, and all authors reviewed outputs from the comparison. The preliminary draft of the paper was written by BT. This was critically reviewed by CH, IL, SG and SK for important intellectual content and subsequent revisions to the paper were undertaken by BT as a result. Final approval of the version of the paper to be published was granted by BT, CH, IL, SG and SK, who all also agreed to be accountable for all aspects of the work in ensuring that questions relating to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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DATA SHARING

Data is securely stored at the University of Birmingham in line with our information governance and data protection policies. Due to the confidential nature of our qualitative data, which may identify individuals even following anonymization, we have not made the data publicly available, in line with our research permissions and consent.

LIST OF ABBREVIATIONS

RA – Rapid Analysis

TA – Thematic Analysis

CLAHRC – Collaborations for Leadership in Applied Health Research and Care

MSW – Midwifery Support Worker

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Summary Template

Home Birth Service Exploratory Review Summary Template
PREPARED BY:
DATE:
DATA TYPE (document, interview transcript, focus group transcript):
FOR INTERVIEWS AND FOCUS GROUPS: ***PARTICIPANT IDENTIFIER/S*** ***PARTICIPANT ROLE*** ***PARTICIPANT ROLE IN THE HBS***
FOR DOCUMENTS: **TITLE** **DATE OF PRODUCTION** **AUTHOR**
RATIONALE FOR IMPLEMENTING HBS (POLICY, EVIDENCE, OTHER) **What was the problem, what was going wrong?** **What was the vision** (envisaged outputs, outcomes, impact)
TRAINING:
PROGRAMME THEORY/LOGIC MODEL: ***INPUTS*** *(resources, people)* ***ACTIVITIES*** *(what workers do, e.g. promotional work, clinical care)* ***OUTPUTS*** *(what activities deliver, e.g. women informed about the HBS, women receive intrapartum care at home)* ***and OUTCOMES*** *(results of the outputs, e.g. women book with the HBS, women give birth at home)* ***IMPACT/GOAL*** *(overall aims of programme, e.g. home birth booking rate increases, home birth rate increases)*
FACILITATORS of IMPLEMENTATION Planning/process People Culture Money Organisation/bureaucracy Evidence/policy Other
BARRIERS TO IMPLEMENTATION AND SOLUTIONS Planning/process People Culture Money Organisation/bureaucracy Evidence/policy Other
ROUTINELY GATHERED DATA (HOW,WHERE, WHEN, WHO COLLECTED, WHERE DATA HELD)
KEY DOCUMENTS WE SHOULD INCLUDE (e.g. service specification)
OTHER IMPORTANT OBSERVATIONS
IMPORTANT QUOTATIONS
REFLECTIONS ON THE DATA COLLECTION EPISODE