What does the structure of a medical consultation look like? A new method for visualising doctor-patient communication

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Abstract

Objective

This project developed an innovative methodology for visualising consultation structure by categorising doctor-patient talk into the phases proposed by an established educational model of clinical communication.

Method

Consultation phases were identified from verbatim transcripts using the tasks and process skills of the Calgary-Cambridge Guide to the Medical Interview. Seventy eight simulated consultations from a 'History-taking' station of a postgraduate examination for physicians were analysed by two independent raters. Transcripts were converted into diagrams comprising up to six phases: *Initiating, Gathering information, Summary, Explanation, Planning* and *Closing*.

Results

The dominant phases were *Gathering information, Planning* and *Explanation* (66%, 10% and 12% of talk respectively). While consultations broadly followed the expected chronological sequence, less than a third (23/78) contained all six phases, with *Closing* and *Summary* most frequently absent. Half of consultations (40/78) did not include phases in the predicted order, with intertwined phases commonly observed.

Conclusions

In this standardised setting, doctors created variable consultation structures, typically omitting phases involving consolidation and agreement of plans going forward.

Practice implications

The method enables visualisation and comparison of consultation structure. The findings pose questions about the alignment of practice with educational guidance and the opportunities afforded to patients to actively engage in consultations.

1. Introduction

International educational guidance emphasises the need for doctors to create an organised structure for their consultations in order to accomplish core tasks, and to share that structure with patients [1-8]. This is reflected in national and international consensus statements detailing core curricula for doctor-patient communication, which form the basis of undergraduate and postgraduate education and assessment [9-14].

Typically, clinical communication models used in medical education propose a series of chronological stages for the consultation, starting with a beginning (scene-setting/agenda-setting) phase, followed by stages focusing on gathering information, providing information, planning, and consolidation and closing. Models recommend specific elements of *content* within these stages (e.g. obtaining details of the patient's medical history or establishing the patient's perspective) as well as *communication process* (e.g. listening attentively or showing empathy) [15]. Together, these enable the achievement of core consultation tasks, such as establishing a shared understanding of the problem or agreeing the way forward [1,6]. A variety of verbal strategies for doctors to share the organisation of the consultation with patients are recommended by international educational guidance, including strategies to *inform* the patient about the plan for the consultation, *invite* the patient to participate in creating the plan and *instruct* the patient to follow the doctor's plan [16]. The assumption underpinning educational guidance is to support the doctor in creating a logical structure that is clear to all participants, enabling the goals of the consultation to be achieved efficiently. Extensive empirical evidence over the past three decades has confirmed the efficacy of consultation skills training using clinical communication models, and the positive effects on outcomes from the

skilled doctor-patient communication that ensues [17-27]. An organised consultation plays an important role in promoting patient agency through empowering patients to take an active role in healthcare, with consequent health benefits [17-27].

Despite the educational focus on promoting structural organisation, relatively little research has examined how doctors organise their consultations in practice. Byrne and Long [28] pioneered the observation of medical consultations *"to discover if there were any features of the consultation which were common to all consultations"*. Through examining recordings of primary care consultations, they identified six consultation 'phases', defined as: *greeting and relating, discovering the reasons for attendance, conducting a verbal or physical examination or both, consideration of the condition, detailing further treatment*, and *terminating the interview*. These phases formed the basis for many of the subsequent clinical communication models used for educating doctors internationally. It is worth noting that Byrne and Long [28] named each phase after the activity of the doctor, rather than the joint activity between patient and doctor – or the patient's activity – and that all subsequent educational models have followed suit. This orientation towards the tasks of the doctor highlights the doctor's role as the 'host' and primary driver of consultation structure.

In the United Kingdom and the Netherlands, researchers observed that many primary care consultations contained all the phases in chronological order, although this was just one of several 'normal' consultation types [28-29]. Some consultations appeared naturally to require fewer phases (e.g. a routine review of previously prescribed medication). However, both Byrne and Long [28] and ten Have [29] observed consultations where the doctor reverted back and forth between phases, which *"may be regarded as being problematic, either for the doctor or the patient"* [28]. Byrne and Long suggested that *"As the doctor controls the evolution of this*

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sequence of events (often apparently unconsciously) he may be observed to be attempting to follow some sort of routine" and that if the doctor moves the consultation back in sequence *"he is not satisfied with the position he has"* [28]. Byrne and Long postulated that doctors' control over consultation structure enabled them to constrain patients' input and *"limit the patient to a defined area"* [28]. This overt exercise of power permitted doctors to confine the duration of the consultation and maintain a focus on doctors' preferred topics (such as biomedical illness over emotional problems). The balance of power in the consultation can manifest in a number of ways, such as the extent to which patients are involved in creating the agenda for the conversation or determining the topics of discussion [30-34]. Thus the organisation of the consultation has profound implications for patient agency and the patient-centredness of care [35-38]. A reduction of patient agency in the consultation may impair patient autonomy, for example, through impeding the processes required for shared decision making [37, 39-40].

In the years since Byrne and Long's work laid the foundation for the current international clinical communication models, there has been a dearth of observational research examining how the structure of doctor-patient consultations aligns with educational guidance. Byrne and Long did not specify how they allocated the doctor-patient talk in the consultations to their six phases, and the line of enquiry investigating consultation structure in routine medical practice was not pursued.

In the educational domain, consultations are regularly observed in formal assessment at both undergraduate and postgraduate levels across the breadth of specialities. In these settings, assessment criteria typically involve specific behavioural checklists or global ratings, or a combination of the two [41-48]. Nevertheless, the consultation structure created by the candidate is not itself part of

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the assessment; rather, it is the implicit architecture upon which the marking criteria are based. Thus assessment tools enable the observation of attributes of doctor-patient communication within the expected consultation structure, without examining the candidate's creation of that structure *per se*. The lack of recent evidence about whether the structure of doctor-patient consultations aligns with educational guidance highlights the need for a methodology to examine consultation structure, as well as contemporary research investigating how doctors organise consultations in practice.

Research questions

The present research aimed to develop a methodology to present the structure of the doctor-patient consultation visually and to explore how doctors organise consultation structure through analysing observed (video-recorded) consultations. Specifically, this study addressed the following questions:

- Can the structure of the medical consultation be identified from doctor-patient talk and presented visually, using the phases proposed by an established educational model of consultation structure?

- Does the organisation of observed consultations align with the structure proposed by an established educational model of the medical consultation?

2. Materials and methods

2.1 Design

This was an observational study examining the structural organisation of medical consultations. Consultation phases were identified from the doctor-patient talk in

transcripts of simulated consultations recorded from a postgraduate medical examination.

2.2 Participants

The participants were 78 doctors: 51% (N=40) women, with a mean age of 31.7 years (SD 5.3); 46% (N=36) with a primary medical qualification from the United Kingdom, 13% (N=10) from the European Union and 41% (N=32) from international medical schools. Participants were doctors taking the Membership of the Royal Colleges of Physicians of the United Kingdom Practical Assessment of Clinical Examination Skills [49] at one examination centre, during one two-week period in 2012 [50]. Of 103 examination candidates, 76% participated: 89 consented; 78 were successfully recorded.

2.3 Setting

Participants were sitting a two-hour practical assessment of clinical skills and knowledge, forming part of the MRCP(UK) Diploma that qualifies physicians to enter specialist training [51]. Participants were video-recorded with written consent in a 14-minute consultation with a simulated patient representing a first general medical outpatient consultation ('History-taking' station). The consultation did not include a physical examination. Trained actors portrayed the patients. Nine scenarios were used in the station, with a range of 5-14 candidates allocated to each scenario. The marking criteria for the station comprised global ratings in five domains (*clinical communication, clinical judgement, differential diagnosis, managing patient concerns* and *maintaining patient welfare*).

2.4 Data preparation

The video-recorded consultations were converted to audiofiles by a member of the project team (RV) and transcribed verbatim, capturing elements of speech (such as

false starts, repetitions and ungrammatical phrasing) and background noises (such as time warnings given by examiners or alarm bells). All identifying details (such as participant names) were removed and transcripts were randomised to avoid consultations from the same scenario or examination date appearing in close proximity. This ensured that the coders (GM and LN) were blind to any participant characteristics (such as age, gender, or ethnic group) that could influence or bias the coding process.

2.5 Measures

The Calgary-Cambridge Guide to the Medical Interview [6, 52-54] was chosen as a template for consultation structure, as it is an international, evidence-based educational model of communication in the consultation applicable to all medical specialities. It is widely used in the United Kingdom and beyond [6, 14, 55] and promotes an organised approach to consultation structure. In common with many clinical communication models, the Calgary-Cambridge Guide defines a series of chronological stages for the consultation: *Initiating the session, Gathering information, Physical examination, Explanation and planning*, and *Closing the session*. The doctor's activity in each of the consultation stages is defined by a list of 73 'communication process skills' [6].

This 'blueprint' provided by the Calgary-Cambridge Guide was applied to analysing consultation structure with a few amendments. Firstly, as the consultations did not feature a physical examination, this stage was removed. Secondly, the Guide recommends *summarising* to be used as needed during the consultation, however, as emphasis is placed on summarising the medical history (particularly relevant in a first outpatient consultation) this was also included as a phase (*Summary*). It was expected that summarising might appear either as a distinct phase after *Gathering*

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information or in shorter bursts elsewhere, or both. The third amendment was to split *Explanation* and *Planning* into two phases. These relate to discussion with the patient about the nature of the problem and the way forward respectively. These had been defined as two phases by Byrne and Long [28], and the Calgary-Cambridge Guide specifies communication process skills related to each task. Although separated into two phases in the present study, it was understood that *Explanation* and *Planning* were more closely connected than the other phases of the consultation. A final set of six phases was used for the analysis: *Initiating, Gathering information, Summary, Explanation, Planning* and *Closing*.

2.6 Coding

The total doctor and patient talk of each of the 78 consultations was allocated to the six phases by two independent raters (GM and LN), using the full list of 73 communication process skills outlined in the Calgary-Cambridge Guide [6]. The extract in Table 1 illustrates how talk was allocated to the phases. For brevity, the extract chosen shows phases occurring in quick succession, but in the majority of consultations, phases extended over several doctor and patient turns. All doctor-patient talk was allocated to the six phases.

Table 1 about here

Inter-rater reliability was assessed for 46% (36/78) consultations. The raters agreed on the phase allocated to 95.3% (5,660/5,993) of consultation turns. This reflected 3.1 instances of disagreement in allocation of talk to phases per consultation (112 instances in 36 consultations), as phases usually comprised several turns. The raters discussed disagreements in the allocation of talk to the phases, with final agreement reached through consensus discussion. Decisions about coding discrepancies were made in relation to three main areas:

- Discourse markers (e.g. 'Okay', 'Right' at the beginning of a doctor's turn): which were allocated to the phase comprising the remainder of the turn.

- Phase transitions occurring within a turn (including within a sentence), or brief interludes of another phase: the raters ensured that coding accurately captured rapid phase transitions and intertwining of phases within turns.

- The distinction between short reflections, often posed as questions, and interim or full Summaries, which it was agreed were presented as statements.

2.7 Creating the visualisation diagrams

An original means of visually displaying consultation structure was devised, in the absence of previous examples from the literature or available software that could readily display the text of the consultations in phases. Using standard word processing software, a template was created to represent each consultation in a diagram using 50 lines of text with 60 characters on each line. Each of the 50 lines represented 2% of the overall consultation, with 30 characters representing 1% of the talk. The word count in each phase of the consultation was converted into percentages that could be placed onto the template. To illustrate this, Table 2 gives an example of the percentages of text allocated to each phase.

Table 2 about here

The percentages were placed onto the template, in the order of occurrence. Figure 1 shows the visualisation of the consultation created from the percentages for Participant 1.

Figure 1 about here

The key on the left of Figure 1 shows the six phases in the corresponding colours. The visualisation of the consultation on the right is designed to be read left-to-right and down, line by line. For example, the first 2.5 lines represent the 5.1% of talk in

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the *Initiating* phase. The two yellow blocks are the examiner signals (two-minute

warning and time up). All 78 consultations were converted into these diagrams.

2.8 Ethics

The data collection was conducted with ethics approval from the Institute of

Education, University of London, and permission from MRCP(UK), and the current

project was conducted with ethics approval from UCL Research Ethics Committee

and permission of MRCP(UK).

3. Results

3.1 Presence of phases

All phases were observed in the data. Less than a third (23/78) of the consultations

contained all six phases, with the majority (37/78) omitting one phase (Table 3).

***Table 3 about here ***

The *Closing* and *Summary* phases were most frequently omitted (Table 4). The only

phase appearing in all the consultations was *Gathering information*.

***Table 4 about here ***

Nine doctors (11%) completed the consultation in the allocated time, all concluding

with the *Closing* phase (Table 5). The majority of doctors were in the *Planning*

phase as the time expired.

***Table 5 about here ***

3.2 Order of phases

Just over half of consultations (40/78) exhibited the phases in the expected

chronological order. However, this included consultations where the first

appearance of phases followed the chronological order, but with phases reappearing

again later (Fig. 2).

Figure 2 about here

This also included consultations exhibiting the expected chronological order whilst omitting phases (Fig. 3).

Figure 3 about here

The majority of the 40 consultations following the expected chronological order had phases missing and intertwined (Table 6).

Table 6 about here

Of the 38 consultations that did not follow the expected chronological order of phases, the early appearance of *Planning* was the most frequently observed variation (Table 7).

Table 7 about here

3.3 Discreteness of phases

All phases were interrupted at least once within the set of 78 consultations (Table 8).

Table 8 about here

This is illustrated by Figure 4. The example on the left shows a consultation containing a brief interlude into *Explanation* (pink) during *Gathering information* (teal). On the right, the consultation exhibits multiple interludes into *Gathering information* during the intertwined *Explanation* and *Planning* phases (pink and purple).

Figure 4 about here

Summary appeared in the majority of consultations (54/78, 70%), either as a main summary of the medical history (after *Gathering information*) or in the form of shorter interludes. Over half of the consultations featuring *Summary* included multiple instances. *Explanation* and *Planning* were most often intertwined (61 consultations); occurred less frequently as discrete phases (15 consultations) or with only one

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component present (2 consultations). Intertwining of *Gathering information* with *Explanation* and/or *Planning* was observed in over half of consultations (40/78, 51%). Within the set of 78 consultations, only one included all phases in the expected chronological sequence with all phases discrete (Fig. 1).

3.4 Proportion of talk by phase

The phases comprised widely different proportions of talk across the consultations, with *Gathering information* showing the greatest proportion of talk and variance (mean 66%, range 50%) (Table 9). The least amount of talk was allocated to *Closing* and *Summary*.

Table 9 about here

Chart 1 shows the distribution of talk visually. The zero bars have been highlighted, showing that over half the doctors (47/78) did not include the *Closing* phase and nearly a third (24/78) omitted *Summary*.

Chart 1 about here

3.5 Comparison of consultation structure within scenarios

Figures 5 and 6 show the 78 consultations grouped by scenario. The visualisations show that the broad chronology of phases was similar across all the scenarios: the dominant phase being *Gathering information*, with varying amounts of *Explanation* and *Planning*, often intertwined, in the latter stages of the consultation. Where *Summary* occurred, it appeared in various locations, usually during *Gathering information*, but also prior to the transition to *Explanation*, *Planning*, or *Gathering information*. Whilst scenarios 1, 7 and 8 included more consultations with a greater proportion of *Explanation* and *Planning*, there are no patterns which clearly distinguish consultations by scenario. Variations in the presence, order and

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discreteness of phases, and proportion of talk across phases, are evident in each of the batches of consultations within each scenario.

4. Discussion

4.1 Discussion

The original methodology devised in this study to reveal the structure of the medical consultation enabled the core stages of the consultation to be identified and presented visually in diagrammatic form. By applying this methodology to simulated consultations from a summative postgraduate assessment for practising physicians, this study has begun to address the question of whether the structure of medical consultations is congruent with educational guidance. This approach to visualising consultation structure can be applied to all medical settings and specialities, and has international applicability to medical education, assessment and the evaluation of healthcare.

The Calgary-Cambridge Guide to the Medical Interview proved a suitable consultation model for this methodology, aided by the detail provided in the 'communication process skills' that defined the talk relevant to each of the consultation stages. The method enabled all doctor-patient talk to be allocated to the six phases of *Initiating, Gathering information, Summary, Explanation, Planning,* and *Closing.* As mentioned earlier, the naming of these structural elements focuses on the activity of the doctor; thus in taking this approach to analysing the organisation of consultations, this study nominally places the doctor at the centre of the consultation structure. This was further reinforced by the title of the examination station in this setting, that pointed to the priority task the doctor must complete ('History-taking'). Taking this perspective positions the patient in more of a passive

role, for example, as a source of information that is 'to be taken'. This implicitly reduces the expectation of patient agency in the consultation, either in determining the goals for the conversation or its structure. Perhaps unsurprisingly, *Gathering information* was the dominant phase identified in the consultations in this setting. The findings provide evidence of the longevity of the phase structure identified by Byrne and Long over forty years ago [28]. Whilst all the expected phases were identified, consultations varied in the number of phases included and amount of time spent in each. Under the controlled conditions of an examination – with the same amount of time, similar scenarios portraying a first medical outpatient appointment, and identical marking criteria – wide variation was seen in consultation structure, including considerable dissimilarity within consultations about the same scenario. The paucity of research examining consultation structure in observed consultations limits comparison with other settings. In primary care, Byrne and Long found variation in the presence of phases, although they did not report the relative proportions of talk per phase.

As clinical communication models used in education propose a logical progression through consultation stages [3-6], it might be expected that doctors would progress through all the phases in turn. Returning back and forth between phases is not mentioned in the models, although this does not imply that it is not recommended: the lack of discussion on this feature renders the position unclear. However, the consultation diagrams revealed the frequency with which doctors switched between phases multiple times, for example, with over half of consultations showing intertwining of *Gathering information* and *Explanation and Planning.* Through their observations and reflective discussions with the doctors conducting the consultations they studied, Byrne and Long [28] suggested that such reversion indicated a problem

with the smooth progression of the consultation. As the present study had no access to the doctor or simulated patient perspectives of the success of the consultations in achieving their aims, it is important to exercise caution in making assumptions about process-outcome relationships.

One consultation stage that is particularly important in enabling the patient to raise elements of their agenda is *Closing,* which functions to consolidate the agreed plan and check that the patient's concerns have been addressed [6]. The omission of this phase suggests that opportunities for patients to ensure that all their needs have been met are less available than proposed by educational guidance. The context from which the data were drawn may have influenced this. Investigating simulated consultations from a postgraduate examination has advantages, such as the controlled conditions ensuring comparability of the task and the participation of experienced physicians at a similar stage in their professional development (as evidenced by their eligibility to undertake the professional examination in question). Nonetheless, although standardised clinical assessments are designed to enable doctors to 'show how' they routinely practise [56], doctors may behave differently under examination conditions. Participants may have altered their behaviour to demonstrate their 'best skills' or the skills they felt examiners most valued. They may have reacted to the station title by prioritising gathering information over other tasks, despite the station brief, which directed candidates to conduct a whole consultation including a management plan.

As the present study examined communication process, not process-outcome relationships [1], it is difficult to speculate about what constitutes 'appropriate' structure in the absence of outcome data. There is a dearth of empirical literature investigating patient preferences about consultation structure or to what extent

patients feel empowered or disempowered through experience of how consultations are organised in healthcare settings. Given the fundamental role of consultation structure in manifesting the agenda for the meeting, future research could examine the relationship between consultation structure and patient empowerment.

4.2 Conclusions

The present study addressed a gap in the literature by developing an original methodology to visualise consultation structure, enabling the organisation of consultations to be examined and compared. Application of this methodology to simulated consultations from a postgraduate examination for practising physicians revealed discrepancies between observed structure and educational guidance that has international relevance to the education and assessment of doctors. The findings emphasise the need for architects of educational guidance to have an understanding of how doctors organise consultation structure in practice.

4.3 Practice implications

Understanding how doctors organise their consultations and allocate consultation time to core tasks has implications for the evaluation of healthcare. The ability to visualise consultation structure and compare consultations could be used to trigger reflective discussions with doctors and patients about the role organisation plays in enabling consultation participants' goals to be achieved. This may reveal whether having a chronological structure of discrete phases or a fluid structure is more efficient, in a given setting, and the optimal distribution of discussion among consultation stages. There is a pressing need for empirical research about the role of consultation structure in empowering patients to participate in healthcare and supporting patient autonomy.

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Table 1. Allocating talk to phases (Participant 24)

Speaker	Turn	Content	Phase
PAT	*Well, yeah. At least, you know, four-five weeks. Anywhere in that time. Uh, the tiredness… yeah. Like five-six weeks.*	Establishing the purpose of the patient's attendance	Initiating
DOC	*And do the tiredness comes first or the, uh, loss of appetite comes first?*	Questioning about the problem raised in the Initiating phase	Gathering information
PAT	*Well, the tiredness, I think, yah, you know… Yeah, about five-six weeks ago, I had, uh, been to the dentist. And, uh, a couple of weeks after that, just started feeling as if I'm really tired, and the appetite's just gone out.*		
DOC	*Okay. So there's tiredness, and then loss in appetite, and you've lost some weight as well.*	Recapping information the patient has provided	Summary

Table 2. Allocating percentage of talk to phases (Participant 1)

Order in consultation	Phase	Word count	Percentage of total
1	Initiating	120	5.1%
2	Gathering information	1871	79.0%
3	Examiner 2-minute warning	3	0.1%
4	Summary	29	1.2%
5	Explanation	189	8%
6	Planning	114	4.8%
7	Closing	38	1.6%
8	Examiner time up signal	5	0.2%
Total		**2369**	**100%**

Table 3. Number of phases present in each consultation

No. of phases	No. of consultations
6	23
5	37
4	17
3	1
Total	78

Table 4. Number of consultations containing each phase

Phase	No. of consultations
Initiating	77
Gathering information	78
Summary	54
Explanation	77
Planning	77
Closing	31

Table 5. Phase as the consultation concluded

Phase	No. of doctors	No. of doctors completed
Gathering information	3	0
Explanation	14	0
Planning	42	0
Closing	19	9
Total	78	9

Table 6. Variations in consultations featuring phases in chronological order

Type of variation	No. of consultations
No variation	1
Missing phase(s)	5
Intertwined phases	7
Missing and intertwined phases	27
Total	40

Table 7. Phases that occurred earlier than expected

Phase	No. of consultations
Summary	6
Explanation	5
Planning	31
Closing	1
Total	38

Table 8. Frequency of interrupted phases

Phase	No. of consultations containing phase	No. of consultations where phase was interrupted
Initiating	77	1
Gathering information	78	57
Summary	54	29
Explanation	77	57
Planning	77	58
Closing	31	16

Table 9. Proportion of talk by phase

Phase	Word count (N=78)		Word percentage (N=78)	
	Mean (SD)	Range	Mean (SD)	Range
Initiating	175 (81)	0-376	7 (3)	0-16
Gathering information	1560 (330)	805-2262	66 (12)	36-86
Summary	89 (90)	0-373	4 (4)	0-19
Explanation	236 (156)	0-682	10 (7)	0-30
Planning	288 (168)	0-662	12 (7)	0-28
Closing	14 (26)	0-103	1 (1)	0-5

Chart 1. Percentage of talk by phase

% time spent in Initiating phase

% time spent in Gathering Information phase

% time spent in Summary phase

% time spent in Explanation phase

% time spent in Planning phase

% time spent in Closing phase

Number of consultations

Percentage talk in phase
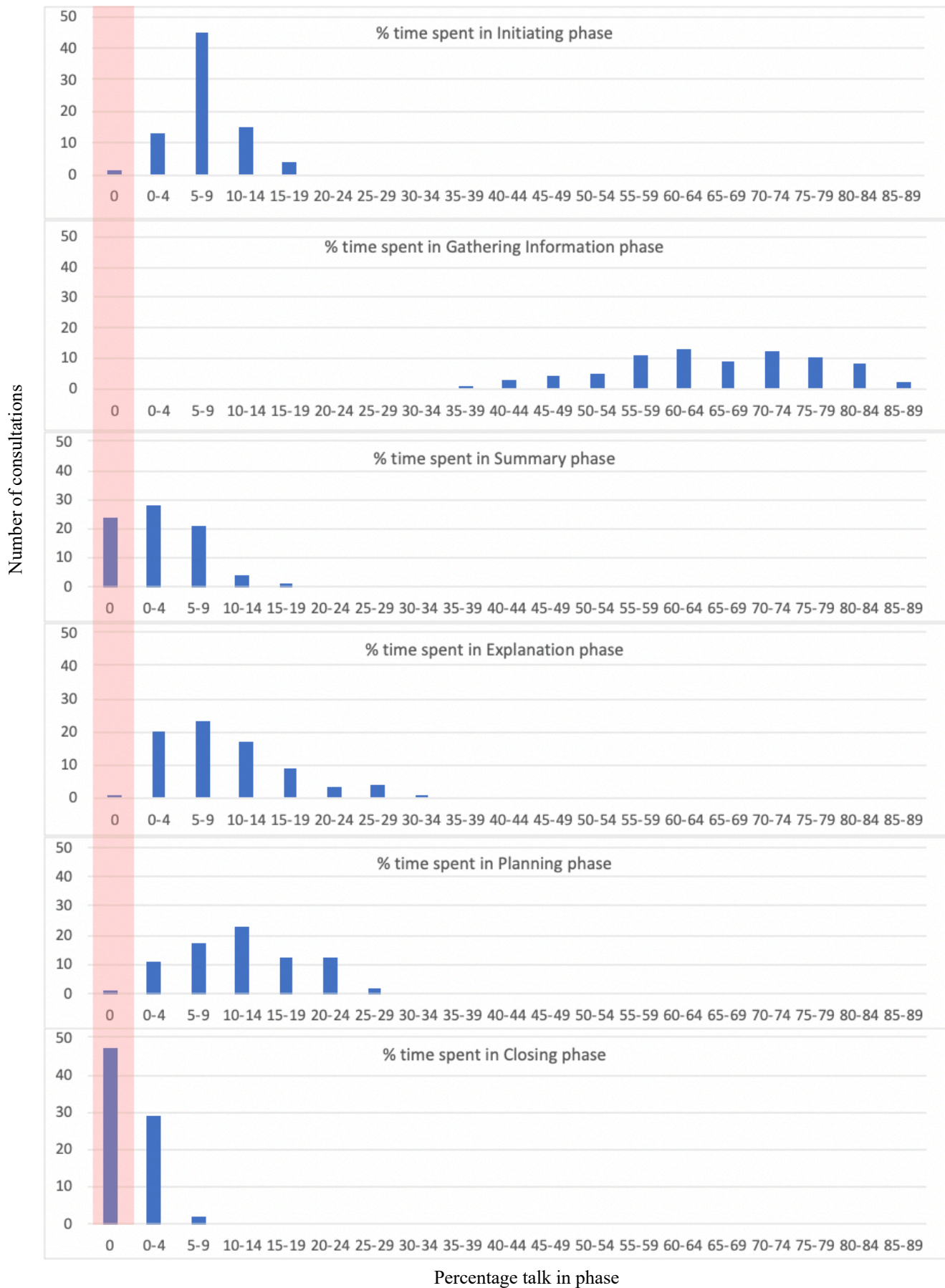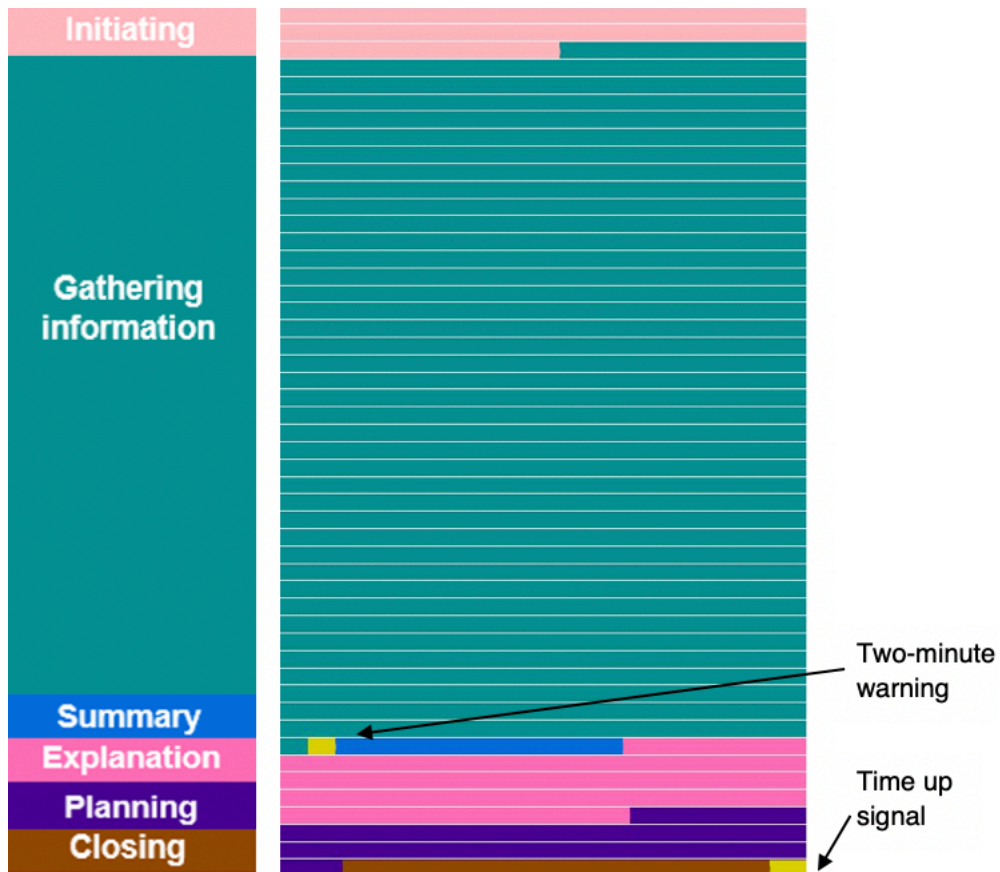
Figure 1. Visualisation of consultation structure (Participant 1)
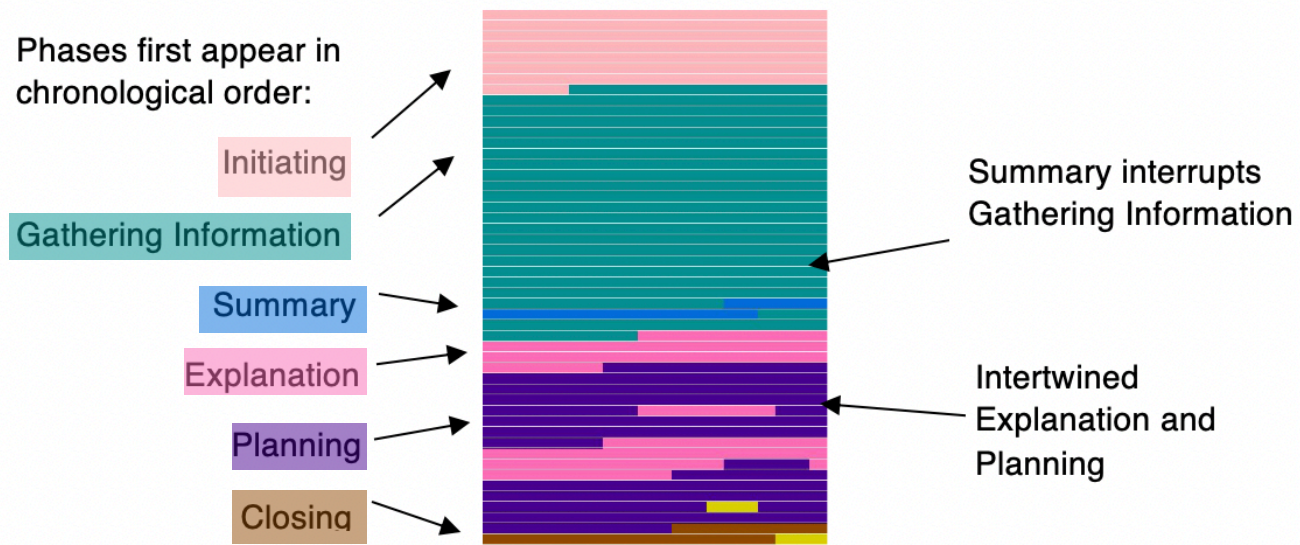
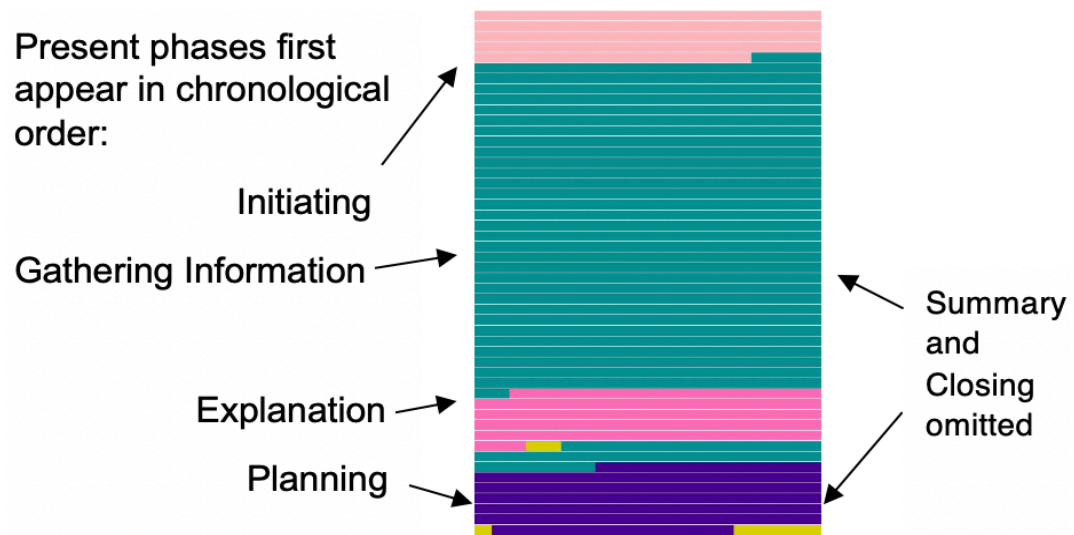**Figure 2. Consultation with phases in chronological order including interrupted and intertwined phases (Participant 41)**

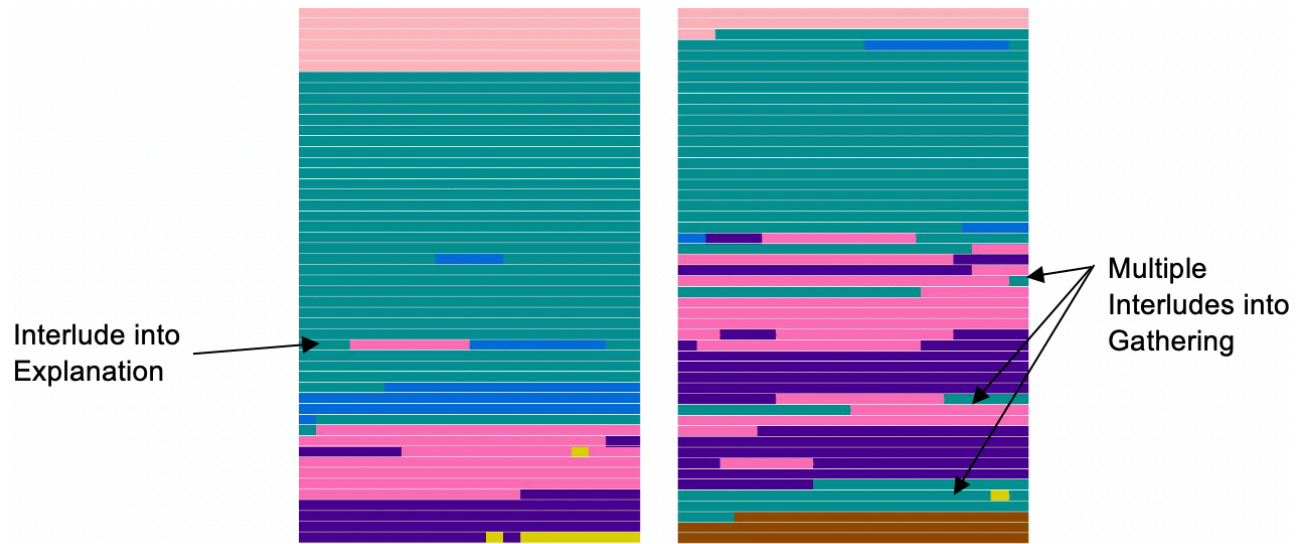**Figure 3. Consultation with phases in chronological order and omitted phases (Participant 76)**

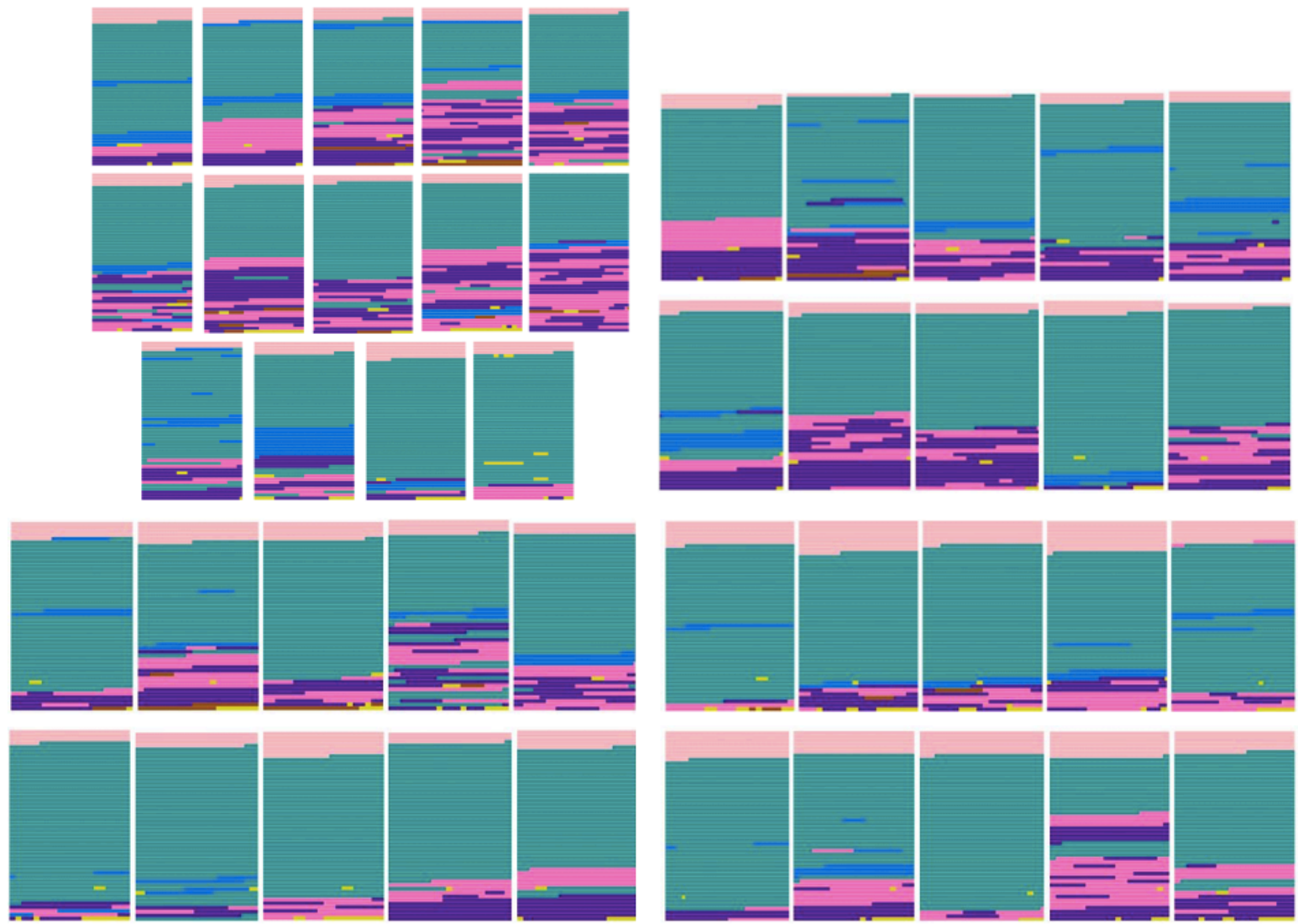**Figure 4. Consultations with non-discrete phases (Participants 48, left, and 24, right)**

Figure 5. Summary of visualisations by scenario. Left to right, top row: scenarios 1 and 2, bottom row, 3 and 4
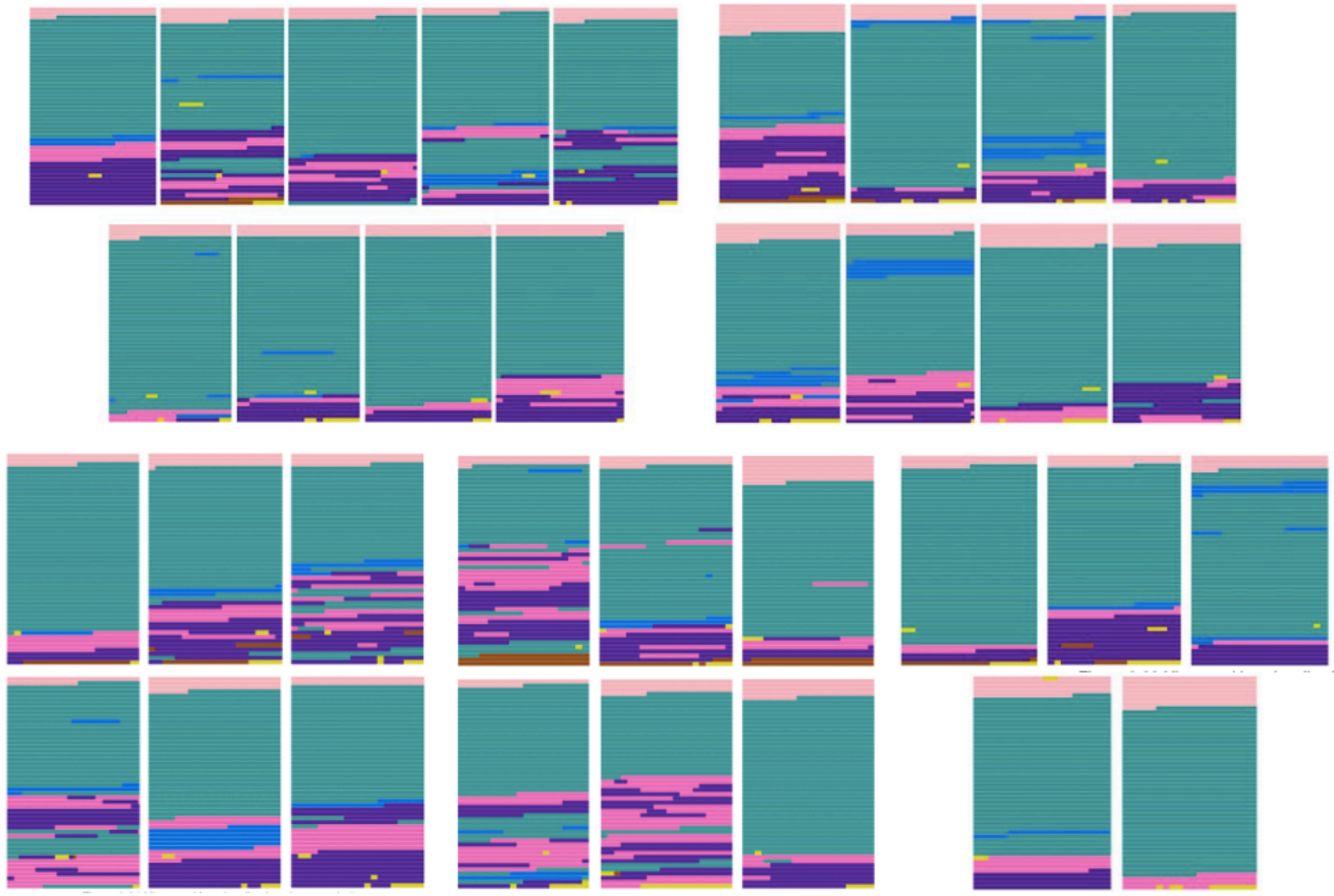
Figure 6. Summary of visualisations by scenario. Left to right, top row: scenarios 5 and 6, bottom row, 7, 8, 9