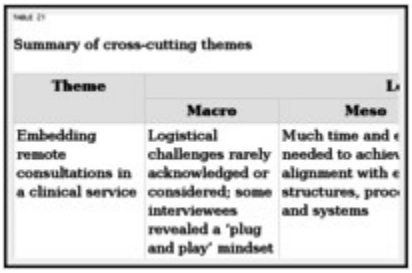
Chapter 6: Discussion and concluding remarks

To our knowledge, this is the first research study in any clinical field to have taken an in-depth, mixed-methods and multilevel approach to the study of remote video consultations. Building on earlier work with the diabetes service at Barts Health NHS Trust, and taking account of the national context (especially the perspectives of policy-makers and those in industry), we followed three clinic teams (in Diabetes, Antenatal Diabetes and Hepatobiliary and Pancreatic Cancer Surgery) for 2 years as they strove to mainstream the service and measure the impact on staff and patients. A significant component of our work was action research – working with front-line teams and also with national policy-makers to identify and address the multiple interacting barriers to the smooth embedding of the service.

We identified five key cross-cutting themes that spanned the micro, meso and macro levels of our data set. *Table 21* summarises the main links identified, based on the combined analysis of consultations (micro), organisational ethnography (meso) and national-level stakeholder interviews and document analysis (macro). Below, we highlight how the themes are framed and addressed somewhat differently by different stakeholders at different levels. This analysis draws on the SST approach outlined in *Chapter 2*; for each stakeholder, we consider how they view the strategic terrain, which perspectives are salient to them as they consider key decisions, what they believe other actors think and how all this shapes and constrains the actions they take (or choose not to take) in particular situations.



Summary of cross-cutting themes

Theme	L	
	Macro	Meso
Embedding remote consultations in a clinical service	Logistical challenges rarely acknowledged or considered; some interviewees revealed a 'plug and play' mindset	Much time and e needed to achie alignment with e structures, proc and systems

TABLE 21

Summary of cross-cutting themes

After discussing the cross-cutting themes, we consider the strengths and limitations of the study, before offering some conclusions and suggestions for further research.

Theme 1: embedding virtual consultations in a clinical service

It is often stated that new technologies need to be 'embedded' in organisational infrastructures and routines. Despite this wide acknowledgement of the need for embedding, our macro-level data suggested that little consideration had been given to this issue by either policy-makers or those in industry. Rather, the use of Skype for virtual consulting was assumed to be a straightforward matter of downloading the software onto the relevant computers – an illustration, perhaps, of the 'plug and play' mindset we have described previously in telehealth discourses.[81]

A significant storyline in our macro-level data was the financial pressures faced by the public sector and the resulting pressures within the health-care sector to work with fewer resources. Technology was often depicted as a logical route towards achieving cost-savings (e.g. by reducing staff time, supporting caring for people at home) and increasing quality (e.g. through improved access). This powerful overarching narrative (evident in both industry and policy discourses) rarely acknowledged the need for technologies to become embedded within existing organisational structures, processes and routines (and the corresponding need to allocate time and resources to this early phase), nor did they acknowledge that once embedded, technologies can and must continually evolve and adapt over time.

In contrast, it was evident from our meso-level data that the introduction and use of Skype technology for virtual consulting required much time and effort, and many resources (and, in some cases, interpersonal or interdepartmental conflict) to achieve alignment with existing management and administrative structures, processes and systems. This is described in detail in *Chapter 4*, and included addressing the concerns of the ICT department about IG and workload, reconfiguring the EPR (e.g. to create new appointment slots that would indicate that they were 'webcam' appointments), and aligning with the routines of appointment scheduling and recording attendance.

Embedding of the technology within existing work routines and practices required high-level commitment across the team and mutual awareness of what other collaborators were doing in order to provide a context for each party's own activity.[228] Strong clinical leadership and 'championing' the new technology and mode of service delivery appeared to be key to overcoming the multiple and interacting barriers on both a small and larger scale. Clinical leaders offered a meso-level 'organising vision'[229] for the introduction and roll-out of the remote approach that provided a shared rationale for why Skype technology should be adopted/used and activated, and co-ordinated stakeholders to promote adoption and diffusion. At the clinic level, in particular, this input helped to ensure that the team functioned collaboratively and effectively towards the shared goal of making virtual consultation services business as usual. Our data illustrated starkly that a high workload and lack of organisational slack (time, space, people, expertise) severely limited front-line teams' capacity to initiate and successfully maintain the embedding of virtual consultations in clinic work.

Theme 2: selecting/inviting patients to use the virtual consultation service

At the macro level, the prevailing policy assumption was that once a virtual service was established as business as usual, it would be a viable, affordable (indeed, cost-saving) option for a high proportion of patients in any given service. For example, the National Information Board stated that:

Better use of data and technology has the power to improve health, transforming the quality and reducing the cost of health and care services.

National Information Board (p. 3).[5]

This was also the case for industry strategists. For example, in an interview with a leading IT provider, the focus was largely on particular products and their potential to be bought into the NHS:

And for, you know, videoconference and instant message functionality generally you think, 'oh my goodness, it would be so easy to do'. And everyone would be on the same system so it would work. Instantly. There would be no interoperability issues.

The above quotations illustrate that, for national-level stakeholders, the strategic terrain (i.e. the different aspects of the external world as viewed by these actors) was shaped by what we have described elsewhere[81] as a 'modernist' organising vision for technology-enabled care delivery. A modernist vision has the following features: technological innovations are rational solutions to the challenges facing the health service (especially rising rates of non-communicable diseases and escalating patient demand) and they will help to achieve efficiency and cost-effectiveness of services, and have the potential to 'empower' both clinicians and patients.

The quotations above – and a modernist vision for technology-enabled care more generally – implies three assumptions that appear to be relatively unexamined by both national policy-makers and industry providers. First, that new technologies (specifically in this case study, virtual consulting) are an effective way of driving new and more efficient models of care into practice at scale, thereby reducing the high and rising burden of outpatient appointments. Second, that when planning the provision of a technology-supported service in a particular condition, the clinical condition can be considered in broad-brush terms (i.e. as a textbook ideal type, as in 'patients with diabetes in pregnancy'). Third, that the patient population can generally be treated as more or less homogeneous in terms of their wider characteristics (or, perhaps, that any differences can be construed as 'gaps' – such as digital literacy – that can be 'filled' by education).

At the meso level, the original introduction of virtual appointments for diabetes at Barts Health NHS Trust back in 2009 was not unrelated to the growing pressures on outpatient services and the year-on-year reduction in budgets. But it was driven more immediately by the high DNA rate among young adults (around 50%), and by a belief of the lead consultant and diabetes specialist nurse that large numbers of young adults were becoming disengaged from the service and defaulting from follow-up. In particular, a virtual service was considered to be a potential way to retain 'harder to reach' patients, such as black and minority ethnic and lower socioeconomic groups (who were, for example, less likely to be allowed paid time off work for appointments, and who struggled to meet the cost of transport to hospital). The clinicians' view was that the use of technology would make the service more accessible to a group of patients whom they viewed as particularly vulnerable. For example, and as part of a general strategy of making the service more accessible to patients who were reluctant to engage, they encouraged patients to message them on Skype and spent time responding to these messages; the virtual service included a growing proportion of patient-initiated consultations, in which patients would see that the doctor or nurse was online and send a Skype message asking for a non-booked consultation. Earlier publications on the virtual diabetes service at Barts Health NHS Trust emphasised how a 'disengaged' clinic subpopulation had been successfully re-engaged by offering the service and making it possible for such patients to contact the doctor or nurse at their convenience, whenever and wherever they sought advice or support.[9,11]

The extension of the virtual consulting model to Antenatal Diabetes services was driven partly by the need to address steadily rising patient numbers in the Antenatal Diabetes outpatient clinic (the incidence of gestational diabetes is increasing in parallel with growing levels of obesity, for example). However, clinicians were also motivated to try to reduce the burden on pregnant women of making frequent visits to a busy hospital clinic, perhaps with toddlers in tow. Gestational diabetes can be labile and need daily adjustments in insulin dose, and hence become burdensome and potentially difficult for the (otherwise well) pregnant woman. In keeping with the idea that pregnancy is a normal physiological state, not an illness, both midwives and doctors seek to avoid 'medicalising' the condition if at all possible.

Similarly, the clinical lead of the Hepatobiliary and Pancreatic Cancer Surgery service was keen to reduce the burden on his patients of making long journeys for a clinic check-up in the postoperative period. As long as there was no clinical reason for the patient to be seen face to face, it was viewed as clinically more appropriate for the patient to stay at home and be seen remotely.

Thus, when making the (meso-level) decision to introduce a virtual consultation service, clinical leads saw the strategic terrain at least partly in terms of improving the quality and accessibility of the service for patients, for whom a journey to the hospital was – variously – unnecessary, inconvenient, unaffordable or clinically inadvisable. Such drivers were rarely mentioned by national-level stakeholders (whose economic models did not generally include patient-borne costs or patient time).

Although the doctors (and to some extent, nurses and midwives too) in participating clinical teams viewed the virtual consultation service as improving accessibility and increasing choice for patients in general, they did not view this service as automatically available to all clinic patients. Rather, and in every particular case without exception, a clinical judgement was made on the 'suitability' and 'appropriateness' of the patient for the virtual services.

Decisions around suitability were made on a case-by-case basis and informed by a range of factors that varied across the different clinical contexts, and were discussed and mutually agreed with the patient. Such decisions appeared to be difficult to anticipate in advance and to require three things: (1) clinical experience in the relevant specialty, (2) tacit knowledge about how virtual consultations play out in this particular condition (e.g. content to be discussed, materials/resources needed, likelihood or not that a physical examination will be needed) and (3) personal knowledge of the patient. The last of these appeared to involve a subjective assessment of the patient's health literacy (in general, and specifically, in relation to the clinical condition), IT literacy, the ability to communicate (e.g. across a language barrier) and confidence. The main question driving the decision appeared to be 'would a virtual consultation be clinically safe for this patient, with this condition, at this time, for this aspect of their care?' (see the quotation in *Chapter 4, New clinical roles and practices: triage, technical support and direct access*).

Applying SST to the decision of whether or not to offer the option of virtual consulting to a particular patient, the strategic terrain looks somewhat different from what it looked like for the macro- and meso-level stakeholders. At this micro level, and notwithstanding that this was an experimental service that had not yet been fully tested or incorporated into business as usual, the over-riding influence was a professional norm: primum non nocere (first, do no harm). Our interviews with doctors in particular highlighted the strong sense of clinical responsibility for the

patient, along with a sense that they would be held accountable (both professionally and legally) if harm resulted from a virtual consultation. This theme, which was very strong in our micro-level data, was not in evidence in the meso- or macro-level data sets.

Expressed in the language of SST, our data support the conclusion that the clinicians' general dispositions (based on education, experience, professional norms, values and so on) were oriented to providing a virtual service that they saw as accessible and convenient for patients, and which may also save money and help to ease the pressures on the outpatient clinic. But these general dispositions were often (and in the case of Antenatal Diabetes patients, almost always) over-ridden by the clinician's conjuncturally specific assessment of whether or not a virtual consultation was appropriate for *this* patient in this situation, given these contingencies. Furthermore, it was only when the service had been introduced on a pilot basis and the clinicians began to make these fine-grained decisions that the non-suitability of virtual consulting for many patients became apparent.

The high barrier in some specialties to offering the virtual consulting option contrasted starkly with the view of our patient advisory panel that all patients should be offered the virtual option so that the service was available to all patients who chose to use it. This view was strongly and universally held by those participating in discussions on the topic. Implicit in this view was the assumption that it was the patient, not the clinician, who was best placed to make the judgement about the trade-offs between clinical safety and convenience of access. One patient made the point that, although the clinical grounds for 'suitability' may be best assessed by the clinician, there were many wider influences (such as the impossibility of getting time off work or the need to collect children from school) that were best assessed by the patient and/or carers.

Using SST, we can say that the strategic terrain for the patient is characterised by a host of practical, material and sociocultural influences, along with various commitments and accountabilities (to employers, other family members and so on). For the patient, the care of the clinical condition cannot be considered in isolation from the wider landscape of things at stake.

Theme 3: doing a remote consultation

'Doing' a remote consultation involved three phases: first, establishing connection (technical); second, the actual encounter (clinical); and third, arranging follow-up (administrative). Our macro-level data suggest that neither policy-makers nor industry stakeholders paid much attention to the detail of the virtual consultation. Apart from recognising the obvious fact that certain aspects of the physical examination would be impossible in the remote encounter, they appeared to assume that the latter would be unproblematic and unfold in a more or less similar way, once a successful technical connection had been established; the policy-makers we interviewed did not consider how the clinical encounter would link with the administrative task of booking the next appointment.

Our industry participants were keen to ensure that the technology was appropriately designed and adapted to support a high-quality connection, and that its functionality supported the nuanced affordances that were likely to be needed clinically. For example, they showed interest in reviewing (with consent) selected video-recorded consultations, better understanding how different clinicians and patients use virtual consultations and adapting the Skype software for

different health-care settings and clinical contexts (e.g. improved video quality, the use of multiple screens, developing 'virtual waiting rooms'). Their main focus, however, was on advanced design and functionality.

At the meso level, 'doing' a virtual consultation was far from straightforward. As noted in *Chapter 4*, 'getting the patient set up' for such a consultation involved considerable 'hidden work' around practical issues, especially providing flexible (and unofficial) IT support, undertaking 'test calls' with patients (in which no clinical discussion was held), following-up on 'contact requests' (in which the patient had sent a Skype message asking for a contact) and messaging the patient to inform them of their appointment time (or confirm or amend such an appointment). As *Figures 3*–*8* illustrate, even when the virtual consultation service was relatively well routinised (as in the Young Adult Diabetes Clinic), much of this hidden work fell to the clinician.

Our micro-level analysis of the use of Skype to support actual consultations (described in detail in *Chapter 5*) revealed that consultations unfolded smoothly only when – and to the extent that – both parties engaged both in the technical set-up phase and in an ongoing process of adaptive troubleshooting to ensure that the technology 'worked' and the encounter mirrored, as far as possible, the conventional clinical encounter in that specialty. In the VOCAL study, the clinician was the main (and usually the only) staff member involved in the technical set-up phase before the consultation could begin. His or her role included fiddling with equipment and making adjustments to technology settings in order to resolve problems as and when they arose. Often, clinician and patient worked together to troubleshoot and perform one-off workarounds for unique technical and/or logistical problems.

The introduction of virtual consulting in this particular organisation[137] (i.e. this does not necessarily mean that it must happen this way in other organisations) thus required a significant element of 'reskilling' and development of know-how among clinical staff to resolve unique technical problems and improvise in new situations. Our ethnographic observations affirmed the previous observation of Brown and Duguid[230] that such knowledge is typically exchanged among staff on the clinical team through social interaction, and, in particular, via the exchange of stories (sometimes with humour when describing a technical difficulty and efforts to resolve it).

Arguably, the extension of the clinician role need not necessarily be a prerequisite for delivering virtual consulting (private-sector virtual consulting services, for example, appear to be characterised by a dedicated administrative and technical team who take responsibility for the initial technical set-up phase and ongoing technical/logistical support, while the clinician sticks to a more traditional clinical role[231]). As Barley[137] observed, technology introduced into health-care settings is 'an occasion for structuring' – that is, it offers the opportunity for developing new roles and competences, but because of its inherent interpretive flexibility (i.e. technology can be used differently by different agents), it does not produce these new roles in a deterministic way. Whether the tacit knowledge for technical set-up and support is developed by clinicians, administrators or both, it is clear from our findings that organisations should consider how to create the conditions for social interaction that will cultivate and support the sharing of such tacit knowledge and know-how.

The patient was also required to develop and apply a set of technical skills, including the ability to troubleshoot in real time and interact with the clinician to deal with problems as they emerged.

Different patients were more or less willing and more or less able to do this. As well as general IT literacy and specific experience and understanding of the Skype technology, factors influencing their capacity to consult remotely included the material properties of their hardware and software and people available to help out with set-up and troubleshooting.

In relation to the clinical aspects of virtual consultations, our study demonstrated that the interpersonal interactions and dynamics had subtle, but potentially important, differences when undertaken remotely compared with face to face (see *Chapter 5*). Although our sample was small and the findings provisional, it appears that for equivalent clinical interactions, virtual consultations are generally shorter, somewhat less clinician dominated (i.e. the patient had a higher proportion of talk time) and include considerably more technology-related interaction. But these differences were likely to be explained largely, if not entirely, by the physical and material differences between remote and face-to-face consultations, which necessitated the verbalisation of certain aspects of communication in the former, but not the latter. In addition, of course, some consultations (requiring a physical examination) cannot take place virtually.

The clinical aspects of the virtual consultation could not be separated cleanly from the technical and practical aspects. During the virtual consultation, for example, both clinician and patient made extensive use of other artefacts (including paper and electronic records) to support their own input to the interaction and make the other party aware of information that would have been more readily evident in a face-to-face encounter. Workarounds (often invisible or subtle) were frequently needed to adapt roles and processes to the contingent detail of an unfolding consultation. As detailed in *Chapter 4*, considerable 'articulation work' (i.e. the ability to co-ordinate resources, actions and people) was sometimes needed to deal with local contingencies and unanticipated situations.

We also found that an existing relationship and 'common ground' between the patient and clinician appeared to be a positive precondition (although perhaps not an absolute requirement) for effective virtual communication. An awareness of these social dimensions of video-mediated communication helped practitioners to evolve their approach to service delivery and relationship formation (e.g. utilising Skype for routine follow-up, developing an initial rapport with patients face to face, inviting patients to message them with questions).

Finally, as described in *Chapter 5*, the third phase of the virtual consultation – booking a follow-up slot – appeared to depend on the clinician's willingness to engage with this administrative task, their familiarity and skill with the booking system and their ability and confidence to judge between a face-to-face encounter, a Skype video consultation and a Skype message interaction.

Theme 4: privacy and security

At the macro level, national-level stakeholders from government and industry were concerned about IG only insomuch as they recognised the need to ensure that regulatory requirements were fully met and that public perceptions of data security and privacy were positive. These concerns were generally expressed at a generic level (all digital health initiatives were viewed as raising similar IG challenges) and policy-makers did not appear to be aware of the detail of the specific privacy and security issues around remote video consulting. The national-level policy-makers in our steering group were keen to work with us in producing IG guidance on this topic, with a

view to ensuring that the introduction of virtual consulting in other NHS organisations followed a more or less standardised and approved process.

At the meso level, one of the major barriers to the implementation of virtual consulting services within the trust was strong concerns around IG, particularly from the IT department. These concerns appeared to be driven by a perception of strict regulatory and legal pressures, and reinforced by a lack of national consensus on the appropriateness of Skype (and similar virtual media) for use within the NHS. As set out in *Chapter 4*, this barrier formed a significant part of the action research component of our study, in which we sought to address the prevailing lack of consensus through the creation of guidance and protocol documents (both local and national).

These documents appeared to act in some sense as 'immutable mobiles'[228] or 'boundary objects'[232] that served to support dialogue and co-operation across clinic and administrative departments (and between local teams and national policy-makers). Indeed, the way in which the documents (and the writing of them) brought people together for further discussion was at least as important as the actual list of procedures to be followed. Indeed, although protocols and SOPs certainly provided guidance that staff found helpful, it was also widely believed to be necessary to 'work around' official procedure when in the best interests of the patient.

Interestingly, our micro-level analysis showed that although patients and their carers were aware of IG issues at some level, they were generally relaxed about these and rarely, if ever, cited such issues as a reason not to consult remotely. This finding resonated strongly with our previous work on patient concerns about the summary care record, which showed that patients considered the trade-off between potential security breaches (a theoretical possibility, but in practice unlikely) and accessibility and quality of clinical care (potentially enhanced through the use of the new technology), and if they trusted the clinician, they tended to trust the clinician's use of the technology.[233] Indeed, our interviews with patients revealed that some placed high value on the fact that a trusted clinician was 'visiting' their home and sometimes took time to show the clinician aspects of their home (such as posters on a bedroom wall) as a way of developing the established relationship further.

From the clinician's perspective, the data security aspects of the consultation were taken very seriously. Clinicians were aware of procedures to maintain patient privacy and confidentiality; they applied these flexibly – and sometimes used workarounds in a way that prioritised the patient's best interests (e.g. using the researcher's login to ensure access in the face of technical problems).

Theme 5: roll-out and scale-up

Our macro-level analysis of policy documents and interviews with policy-makers (described in detail in *Chapter 3*) showed that, since at least the early 2000s, there has been a strong policy emphasis on the need for 'transformation' of health and social care provision. In these policy narratives, virtual consultations are depicted as having a role in delivering this transformation 'at scale' and 'at pace'. The implication is thus that following an initial set of pilot studies and demonstration projects, the introduction of virtual consultations will gather speed rapidly. In reality, the literature on national roll-outs of 'transformational' IT projects in health care suggests that this assumption may be overoptimistic.[69] Indeed, just because a technological innovation has

been successfully implemented and embedded in one locality, each new setting will continue to face significant implementation challenges, and there may be a considerable time lag between the adoption of technology and the realisation of any productivity gains.

Interviews with industry representatives from both large and smaller companies indicated a similar conviction in the potential of virtual consultations to deliver transformation at scale and pace. However, although industry representatives welcomed the shift away from the centralised procurement characteristic of the National Programme for IT (2007–11) and the extension of NHS contracts to a wider range of providers, they continued to struggle to engage with health-care organisations and systems. The relationship between the technology industry and the public sector was repeatedly cited as complex, with procurement processes in particular presenting challenges to potential scale-up. Interviewees talked about investment in industry–NHS partnerships as a means of working together to develop and adopt technologies, but recognised this a resource-intensive process with little guarantee of significant (i.e. national) roll-out in the short term.

At the meso level, much of our ethnographic fieldwork and action research consisted of observing and supporting the trust as they strove to overcome the many barriers to mainstreaming virtual consultation services. This initiative was explicitly driven by a strategic focus on transforming care and, as such, had the support of senior executive teams and dedicated resources and staff.

Specifically, the virtual consultation service that had initially developed as an ad hoc project led by interested clinicians within the Diabetes service was aligned with TST, a trust-wide initiative aimed at reducing the number of face-to-face consultations across all clinical services as appropriate. The TST initiative was associated with a significant shift in logistical and technical support, from bespoke support to the innovator department (Adult/Young Adult Diabetes) and two ‘early adopter’ departments (Antenatal Diabetes and Hepatobiliary and Pancreatic Cancer Surgery) to a service that now cuts across (at the time of writing) four local departments and with another four planned. As described in *Chapter 4*, *Trust policy and service-level agreements*, the provision of SOPs and central support undoubtedly helped to ‘oil the wheels’ for departments seeking to introduce and embed the new service. However, these central initiatives and resources inevitably also meant a shift towards the centralisation of control, which could potentially conflict with the ‘bottom-up’ and grounded approach we observed in the early adopter departments.

At the micro level, and as described in detail in *Chapter 5*, our in-depth analysis of virtual consultations has illuminated the numerous context-specific interactions and local contingencies that are integral to providing a successful technology-supported remote consulting service. The implication of these micro-level data are that imposing a centrally driven, standardised solution for implementation and embedding as part of the wider roll-out is unlikely to go smoothly. Indeed, we have recently shown, in using different types of technology as an example, that ‘scale-up’ and ‘roll-out’ should be considered to be social practices (i.e. the uptake of the technology should be studied in the context of what human actors find salient, meaningful, ethical, legal, materially possible and professionally or culturally appropriate in particular clinical or social situations).[136]

Conclusions

One clear conclusion from this study is that setting up a virtual consultation service is no bowl of cherries. 'Embedding' Skype (or comparable technologies) at the meso level into organisational infrastructure and routines is likely to require not only substantial set-up resources, but also ongoing human effort, as well as time and resources. The lack of recognition of the magnitude of this challenge at the macro level by policy-makers (and, to a lesser extent, industry representatives) is one of the main findings of this study.

A second conclusion is that the adoption, implementation and day-to-day use of virtual consulting is necessarily both adaptive and contingent, involving what are often complex clinical decisions and with a strong over-riding framework of (for the clinician) clinical safety and (for the patient) practicality and personal accountability. In the Young Adult Diabetes service, in particular (which had been running remote consultations for several years when this study was commenced), clinicians had used their autonomy to 'repurpose' the Skype technology to facilitate access to care in a way that had not been anticipated at the national level. This adaptive and selective use of Skype at a local level aligns with the classic work by DeSanctis and Poole[234] on adaptive structuration theory; it challenges the assumptions (particularly at the government and industry levels) that a 'digital innovation' is a fixed and clearly definable option, used in a particular way, that needs to be 'engaged with' in a standardised way across the public sector.

Our third conclusion is that the model–reality gap for 'doing' a virtual consultation is wide. The virtual consultation was depicted at the policy level as a straightforward and unproblematic task using a reliable 'plug and play' technology. The logistical reality of such consultations at the level of the organisation or clinical team (meso) and at the level of the actual interaction (micro) told a different story; clinical work tended to unfold in a unique and messy way, with multiple subtle contingencies (both clinical and technical). Dealing with these contingencies required work and interaction from both clinician and patient (only some of whom had the inclination and capacity to engage with this).

Fourth, although the governance and regulation of virtual consulting is widely perceived as something that can be 'fixed' through the development of standards and guidance (and while we ourselves contributed to the development of such guidance as part of this study), our findings suggest that 'articulation' (including unofficial workarounds) is part of the reality of virtual consulting. Goorman and Berg[235] define articulation as follows:

All tasks involved in assembling, scheduling, monitoring and co-ordinating all of the steps necessary to complete a production task (patient trajectory). This means carrying through a course of action despite local contingencies, unanticipated glitches, incommensurable opinions and beliefs or inadequate knowledge of local circumstances. Every real world system is an open system . . . No formal description of a system (or plan for its work) can thus be complete . . . every real world system thus requires articulation to deal with the unanticipated contingencies that arise. Articulation resolves these inconsistencies by packaging a compromise that 'gets the job done' that is, that closes the system locally and temporally so that the work can go on.

What this means is that the generation, endorsement and dissemination of SOPs (a tangible achievement of this study) will not, in and of itself, make virtual consultations happen. Attention also needs to be paid to the messy reality of implementing these standards, in particular, in 'imperfect' real-world settings. To help with this, we have provided a set of practitioner resources alongside this report that have been informed by emerging findings, been actively used and refined as part of our action research and are intended to support service providers, professional bodies, policy-makers and patients and carers who are interested in or actively pursuing the development of virtual consultation services.

In relation to the prospects for extending the virtual consultation model to other clinical specialties and other NHS organisations – and notwithstanding the powerful prevailing policy discourse on 'scale-up' and 'roll-out', which is assumed to be achievable rapidly and 'at scale' – our findings indicate that mainstreaming virtual consulting across multiple departments in multiple organisations will be neither smooth nor quick. The clinical and logistical realities will play out differently for different clinical specialties and different hospital departments (not to mention primary care). On the basis of empirical data from the three departments we have studied in detail, our brief exposure to four further departments in the same trust and contact with various groups across Barts Health NHS Trust involved in virtual consultations (e.g. the outpatient project strategy group), as well as on the theoretical literature cited above, we anticipate that each and every department in every organisation that seeks to embed virtual consulting will need to take a sociotechnical systems approach[236] to organisational change. Specifically, they will need to emphasise 'minimal critical specification' (no more specified than absolutely essential), the 'sociotechnical criterion' (problems should be resolved by groups that directly experience them) and 'incompletion' (the need for continual revision of objectives and structures).[236]

Strengths and limitations of this study

The main strength of this study is that it is, to our knowledge, the first major study of remote video consultations from a sociomaterial perspective that has attempted to link different levels of data collection and analysis across the macro level (the historical and current policy drivers and wider sociocultural, technological and economic context), the meso level (the practicalities of organisational and service change) and the micro level (the fine-grained detail of the actual consultation). In contrast to trials of virtual consultations, which have provided little insight into the organisational complexities of implementing a new technology-enabled service or how such services evolve and (may or may not) become embedded in health-care settings, the naturalistic, mixed-methods and multilevel design of the VOCAL study has enabled the study of the emergence of video consultation services and the challenges faced in this process.

We succeeded in our goal of collecting rich qualitative data that allowed us to go beyond the more usual approach of making simplistic 'technology on versus technology off' comparisons with narrow, predefined outcome measures. In short, and notwithstanding the impressive features of the technology that allowed a clear video link to be set up with the patient at home, our ethnographic approach exposed the 'messy reality' of establishing a virtual consultation service and illuminated the pros and cons of using this medium for clinical interaction in different settings.

Another advantage of our study design was the prominent action research component. This operated most obviously at the meso level, allowing (indeed, requiring) the research team to work collaboratively with the clinical teams, as well as the trust managers and the ICT department, to help align (for example) the service development, technological development and IG aspects of the 'embedding' of Skype consultations. In addition, one member of our steering group was a member of NHS England's Digital Health team; along with other key informants in our macro-level interviews, he was able to help us to establish a policy dialogue at the national level – particularly in relation to a possible national tariff for virtual consultations. Finally, our key informant interviews with industry representatives also fed back into discussions both locally and nationally about how the industry–NHS partnership over virtual consultations could be strengthened.

The main limitation of the study is its focus on a single NHS organisation, and the sample size for the detailed analysis of virtual consultations was small. In some ways, Barts Health NHS Trust faced a similar set of issues and challenges as any other acute hospital trust during the study period. In other ways, it was unique – or at least, an 'outlier' – in that it faced more severe financial pressures than most comparable organisations (as reported in *Chapter 2*, it was put on 'special measures' by the Care Quality Commission part way through our fieldwork). Thus, despite having many cutting-edge technologies and a state-of-the-art electronic record system in use (Barts Health NHS Trust won the 'Digital Trust of the Year' award in 2014), the reality on the ground was that there was zero 'organisational slack' to support new projects.

As organisational slack is a prerequisite for innovation in any organisation,[237] it is likely that organisations under less tight financial and staffing pressures would have found it easier to introduce a remote consulting service. On the other hand, Barts Health NHS Trust was an innovator organisation in introducing such a service on a pilot basis back in 2009, and the innovator clinician (SV) was a co-applicant on this study and a passionate champion across Barts Health NHS Trust for the use of virtual consultations to reduce health inequalities. Organisations lacking 'innovators' and 'champions' are generally less likely to succeed in complex change projects,[237] so it cannot be assumed that our own case study represented the most challenging context.

Although virtual consultations are relatively new to health care, a number of VoIP products have been available for years, and their numbers continue to grow. Our study focused on Skype as the VoIP product of choice within our case study site, as a result of its popularity (many people attached the idea of calling via the internet to Skype) and a good level of familiarity with Skype on the parts of patients and their families. As we set out in our findings chapters, the use of Skype led to accommodations in the social structure and processes of each of the clinical services and the wider trust. However, as Skype is one of a number of services that can support virtual consultations (others including, for example, FaceTime or GoogleTalk™; Google LLC, Mountain View, CA, USA.), it is possible that some of our conclusions are a product of Skype usage, rather than being common to all VoIP applications. It is also worth noting that a researcher was present in either the clinic or the patient's home when each Skype consultation was set up (primarily to video-record the consultation as data for the study, but simultaneously being viewed by some patients and clinicians as a source of advice and support when seeking to set up a virtual consultation), which may have influenced the set up and progress of that consultation.

Some critics will view it as a limitation of the study that we did not set out to generate an 'effect size' or a cost-effectiveness analysis on the use of virtual consultations. This was deliberate. As we believe our findings have demonstrated, virtual consultations cannot be treated like a drug or even as a complex behavioural intervention to be tested 'on' patients. Rather, they are the result of a hugely complex sociotechnical system, in which 'successful' virtual consulting is contingent on multiple factors at multiple levels. If we appear to have produced ambiguous findings, this is perhaps because ambiguity and tension are inherent to complex sociotechnical systems. To questions such as 'do virtual consultations work?', 'are virtual consultations safe?' and 'are virtual consultations cost effective?', we suggest that the answer will always be 'it depends'.

Use of findings from this research

The VOCAL study deliberately adopted an action research approach that involved working with national and local stakeholders, helping to identify and address potential blocks (e.g. developing new ways of working to enable Skype to be loaded onto clinic computers), develop processes (e.g. SOPs for those seeking to develop virtual consultation services) and feed into ongoing discussion (e.g. regarding the potential roll-out of virtual consultations via the outpatient project strategy group). This 'action' part of the study has generated a number of materials that are already in use within Barts Health NHS Trust and, in some cases, more widely. We have included relevant documents on the NIHR Journals Library website to support those thinking about or setting out to develop virtual consultation services. These resources are evidence based (in terms of both having been developed from research evidence in this study and, where relevant, drawing on documented best practice elsewhere).

The Diabetes service in Newham began conducting virtual consultations in 2011 and has generated considerable experience in developing the service (and related organisational routines) in the years since, as well as working with patients and carers to evaluate and evolve that service. Following publication[9–11] and presentations across the UK about the service, the team in Newham have received over fifty requests for further information (often accompanied by requests for visits and assistance) from trusts across the UK. With a focus on making the best use of the accumulated experience at Barts Health NHS Trust, and being keen to ensure the application of our findings in practice, we have secured an Economic and Social Research Council Impact Acceleration Award and a Health Foundation Scaling Up Improvement grant to help us to extend and apply the research that we have undertaken in the VOCAL study. The grant is an important outcome of the VOCAL project, as it will help to ensure that our findings have the best chance of having an impact on practice by continuing to support and evaluate the wider roll-out of virtual consulting services across Barts Health NHS Trust, adapting and extending this roll-out and evaluation to two other NHS trusts, and collaboratively creating online resources to support the introduction and sustained use of virtual media tools for virtual consulting nationally.

Building on the relationships established as part of the VOCAL study, we are also currently exploring opportunities to work with Microsoft to develop more patient- and health-care-friendly tools via Skype (and related) technology.

Suggestions for further research

There is much scope for pursuing further the basic study design and methodological approaches used in this research to add depth and contrast to the findings presented here. The policy context is changing rapidly and (at the time of writing) the UK is entering a period of unprecedented environmental turbulence in terms of the economic, technological and regulatory context for innovation in the public sector. Notwithstanding a prevailing squeeze on finances and uncertainty about regulatory structures, there is much policy interest in digital 'solutions' and there is likely to be money available for pilot projects. We hope that those who draw on such funding to pilot and mainstream the use of virtual consultations will use a similar methodology to that described in this report to evaluate and document the multiple interacting influences on 'success'. As Flyvbjerg[238] has noted, '[A] scientific discipline without a large number of thoroughly executed case studies is a discipline without systematic production of exemplars, and . . . a discipline without exemplars is an ineffective one'.

There is currently significant interest (from policy-makers, industry representatives and those working in NHS management, as well as patients and carers) in the potential roll-out of digital 'solutions' across the NHS. Previous studies have highlighted how digital technologies, including Skype and similar virtual media, often succeed on a small scale, but fail to achieve widespread use (scale-up) or become routine practice in other settings (spread).[136] Given the current impetus from national policy for NHS organisations to rapidly adopt such technologies (i.e. at scale and pace), combined with the level of work involved in implementing them, both spread and scale-up are potentially fruitful areas for further study. This includes understanding professional and organisational drivers for adopting (and not adopting) digital technologies, such as Skype and other virtual media, into routine patient care; supporting decision-makers in designing policies that can support spread and scale-up and NHS organisations already attempting to incorporate digital technologies; and evaluating the impact of virtual consultations on NHS organisations, as well as patients and professionals. Current research in this field tends to undertheorise the process of scale-up and spread. A potentially fruitful theoretical approach would be to consider the adoption and use of technologies as social practices.[136]

Our study has focused exclusively on Skype as the virtual media platform supporting virtual consultations. There is significant scope for exploring the use of other similar media (e.g. FaceTime) both in the public and private sectors, and the interaction with other digital technologies (e.g. virtual waiting rooms). The VOCAL study has focused largely on mediated consultations using a computer, with some sessions being reliant on other devices (mobile phones and tablets). This raises the question of whether or not there are any differences in interaction and perceived success as a function of the device (or combination of devices) being used.

Only a handful of previous studies (and none from the UK) have attempted to apply the RIAS (or a similar) analytic approach to the study of remote video consultations. As noted in *Chapter 5*, our sample size was too small to draw confident conclusions about the differences in the kinds of talk that occurred in the remote environment compared with the face-to-face environment. We did demonstrate that differences between clinical specialties were more significant than differences between remote and face-to-face consultations within a particular specialty and that many, if not all, differences in the latter were readily explained by practical and material factors. Much additional research could be done, however, to extend the empirical data set on talk in

virtual consultations, generate further hypothesis-driven questions that could be addressed using the RIAS or a similar approach focused on categorising different kinds of talk across different genres of consultation and inform the development of guidance on any suboptimal communicative practices.

The micro-analysis of consultations could also take a more qualitative approach from the perspective of sociolinguistics (e.g. using conversation analysis or discourse analysis). For instance, as noted in *Chapter 5*, the higher proportion of pauses and mutual silence during face-to-face consultations is one area that requires further investigation. A detailed description of, and rationale for, such an approach is beyond the scope of this report (see *The Handbook of Conversation Analysis*[239] for an introduction), but, briefly, this technique sees communication as a dynamic interaction that emerges moment by moment and allows a deeper and perhaps more sociologically critical analysis of the power dynamics of a consultation than is made possible through the RIAS approach. Such an approach would allow for a finer-grained analysis of spoken interaction that could yield original and important findings about the communication strategies that make up a 'good' remote consultation. We have applied for further funding to undertake a detailed interactional analysis of our data set and would be keen to collaborate with other researchers to pool empirical data and develop a common analytic approach.

Finally, our findings suggest that there is much further research to be done that looks at the interactions between the macro, meso and micro levels in the regulation and governance of virtual consultations. For example, our own team is currently undertaking a theory-driven, multilevel analysis of the tensions between risk, governance and patient-centred care, focusing on how institutional regulations impact everyday work practice and interaction with patients, using a theoretical model developed previously by Hillman *et al.*[240] There is much scope to apply such a framework to different kinds of virtual and technology-supported consultation.