Centralisation of specialist cancer surgery services in two areas of England: the RESPECT-21 mixed-methods evaluation

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Disclaimer: This report contains transcripts of interviews conducted in the course of the research and contains language that may offend some readers.

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Scientific summary

The RESPECT-21 mixed-methods evaluation

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Scientific summary

Background

Centralising specialist cancer surgery services

Major system change (MSC) involves reorganising services at a regional level, with significant alterations to care pathways. One example of MSC is centralisation, in which aspects of specialist care are delivered by a reduced number of larger units. There are long-standing recommendations to centralise specialist cancer services, citing the potential to reduce unwarranted variations in access, increase patient volumes and improve patient outcomes by increasing the likelihood of delivering standardised care in hospitals possessing a full range of experienced specialists and equipment.

Changes studied

This study evaluated centralisations of four surgical cancer pathways: (1) prostate cancer, (2) renal cancer, (3) bladder cancer and (4) oesophago-gastric cancer. We focused on networked cancer systems, specifically London Cancer (London, UK), which covers north-central London, north-east London and west Essex (population 3.2 million), and Greater Manchester Cancer (Manchester, UK), which covers Greater Manchester and east Cheshire (population 3.1 million).

In these areas, prior to change, patient volumes in surgical centres were lower than recommended, with variations in access to technology (e.g. robotic surgery), innovative techniques and opportunities to participate in research. It was proposed that services should be centralised into a reduced number of specialist centres (providing specialist surgery) and local units (providing other aspects of pre- and post-surgical care closer to patients' homes).

London Cancer's changes were implemented by April 2016. Greater Manchester Cancer's oesophago-gastric centralisation was completed in September 2018, but urology changes were not implemented as planned.

Objectives

Our research questions were:

- What are patient, public and professional preferences in relation to these centralisations?
- What are the key processes in centralising specialist cancer surgery services in London Cancer and Greater Manchester Cancer, and what factors influenced progress of centralisation?
- What is the impact on staff and health-care provider organisations, including ways of working, skill mix and approaches to collaboration?
- What is the impact of the London Cancer centralisations on provision of care in terms of clinical processes and outcomes?
- What is the impact of the London Cancer centralisations on patient experience, including choice and continuity of care?
- What are the costs and cost-effectiveness of the London Cancer changes?
- How might lessons from centralising specialist cancer surgery services be applied in future centralisations of specialist cancer services and other specialist settings?

Methods

Design

This was a multisite study of centralisation of specialist surgical pathways for four cancers in London Cancer and Greater Manchester Cancer. The study combined assessing stakeholder preferences for change, measuring the impact on clinical processes, clinical outcomes and cost-effectiveness using a controlled before-and-after design (i.e. 'what works?'), with a parallel qualitative analysis of implementation and sustainability of the centralisations (i.e. 'how and why?').

Conceptual framework

The approaches were combined using a framework reflecting inter-related processes of MSC, which covered (1) stakeholder preferences for change, (2) the decision to change, (3) developing and agreeing new service models, (4) implementing new models, (5) adherence to new models throughout the system, (6) impact on care delivery and (7) impact on outcomes (including clinical outcomes, patient experience and cost-effectiveness).

Approaches

Stakeholder preferences for centralising specialist cancer surgery were analysed using a discrete choice experiment (DCE), surveying cancer patients ($n = 206$), health-care professionals ($n = 111$) and the general public ($n = 127$). This DCE examined stakeholder preferences for centralisation, the relative importance of attributes of surgical services and how preferences vary between stakeholder groups.

Quantitative analysis of the impact on care, outcomes and cost-effectiveness were analysed using a controlled difference-in-differences design. Because of implementation delays in Greater Manchester Cancer, only London Cancer centralisations were analysed. We analysed national data sets (i.e. National Cancer Registration and Analysis Service data linked to Hospital Episodes Statistics and Office for National Statistics mortality data) to estimate the impact on key outcomes [e.g. mortality, re-admission and length of stay (LOS)] and the impact on care delivery (e.g. surgical complications and surgical technique). To evaluate the costs of implementing London Cancer changes, we analysed supports of change (e.g. events, clinical and managerial staff time, and programme team costs) and costs of implementing new services (e.g. staffing, space and technology). To evaluate the cost-effectiveness of London Cancer changes, we analysed the national data sets described above alongside national and local unit cost data, incorporating implementation cost, to generate an incremental cost per quality-adjusted life-year (QALY) gained for each cancer.

Our qualitative analysis of implementation and outcomes used a multisite case study design. We analysed documents (e.g. project plans, meeting minutes and local press; $n = 873$), interviews (including clinicians, programme teams and the wider context, e.g. patient representative groups, payer organisations and NHS England; $n = 212$) and non-participant observations [including oversight and planning meetings, and multidisciplinary team (MDT) meetings; $n = 182$]. We analysed factors influencing progress of implementation in London Cancer and Greater Manchester Cancer and the impact of centralisation in London Cancer, including approaches to collaboration, delivery of care and outcomes, and loss experienced in different parts of the system.

To understand how lessons might apply in other settings, we conducted a workshop with national and regional stakeholders from cancer-specific settings ($n = 20$) and non-cancer-specific settings ($n = 12$). Workshop attendees discussed key aspects of our research to help develop lessons that might apply beyond the settings that we studied.

Results

We present our results organised by our research questions.

Research question 1: what are patient, public and professional preferences in relation to these centralisations?

Our DCE established the following points in relation to stakeholder preferences:

- Patients, health-care professionals and the public had similar preferences.
- The preferences of patients, health-care professionals and the public were influenced by risk of complications and death, and access to specialist MDTs. Patient travel time was considered the least important factor.
- Individual preferences were found to be consistent with the major goals of centralising cancer surgery services.

Research question 2: what are the key processes in centralising specialist cancer surgery services in London Cancer and Greater Manchester Cancer, and what factors influenced progress of centralisation?

Our analysis of network leadership in delivering change in London Cancer established the following:

- MSC was a contested process in London Cancer. Some actors across the network, including clinicians and patients, questioned the rationale for change, the clinical evidence behind it and the ways in which the changes were made.
- A core central team composed of network leaders, managers and clinical–manager hybrid roles drove the changes by developing different forms of engagement with provider organisations, distributing leadership across vertical and horizontal layers, and maintaining constancy in central leadership over time. An important enabler was leadership training for clinical pathway leads.

Our analysis of implementation of oesophago-gastric centralisation in Greater Manchester Cancer suggested the importance of learning from history:

- Change leaders in Greater Manchester recognised that having a change process within the context of competition, led by a single group (commissioners or providers), with poor stakeholder engagement and processes amenable to challenge, contributed to the failure of previous reconfiguration attempts.
- The history of failed attempts to reconfigure oesophago-gastric surgery was clear, but also evident was more granular detail, for example the history of relationships between individuals. Change leaders responded to the various facets of history in their efforts to achieve change.

Our cross-case analysis of centralising specialist surgery for urological cancers in Greater Manchester Cancer and London Cancer suggested the following:

- Greater Manchester Cancer faced several contextual obstacles. A history of non-implementation reduced clinical support and trust. Several concurrent, linked change programmes increased the complexity of local decision-making. Planners did not address clinicians' concerns about implications of changes (e.g. for benign urology patients and the workforce), which caused loss of trust and ongoing delays, culminating in local urology clinicians publicly withdrawing support for proposals.
- London Cancer faced fewer contextual issues, but still experienced local resistance. London Cancer's governance (e.g. obtaining senior management sign-up to the change process) enabled system-wide support for proposed changes and this, combined with local clinical ownership of the proposed changes, helped overcome local resistance to change proposals.

Research question 3: what is the impact on staff and health-care provider organisations, including ways of working, skill mix and approaches to collaboration?

Our analysis of network collaboration in London Cancer established the following:

- Provider organisations negotiated power relations across participating organisations to establish shared goals and reached consensus in relation to maintaining patient-centred care.
- Provider organisations maintained central figures who could create and sustain collaboration, and promote distributed forms of leadership.
- These aspects of collaboration were dynamic processes still under transformation during our analysis.

Our analysis of loss experienced by services that stopped providing specialist cancer surgery established the following:

- Bidding for specialised status incurred feelings of loss and personal failure.
- Moving financial and workforce resources to specialist sites destabilised 'ecosystems' in local teams, creating issues with maintaining and recruiting skilled staff.
- MSC can cause loss of motivation and reward in daily work for staff at sites that lose specialist surgical activity.

Research question 4: what is the impact of the London Cancer centralisations on provision of care in terms of clinical processes and outcomes?

- Centralisation of specialist cancer surgery in London Cancer was associated with surgery being performed by high-volume surgeons, which research suggests is associated with better patient outcomes.
- Centralisation of specialist cancer surgery in London Cancer was associated with a significant decrease in length of hospital stay {prostate marginal effect −0.44 [95% confidence interval (CI) −0.55 to −0.34] days, bladder marginal effect −0.563 (95% CI −4.30 to −0.83) days and renal marginal effect −1.20 (95% CI −1.57 to −0.82) days}. The centralisation meant that renal patients had an increased probability of receiving less invasive treatment (0.05, 95% CI 0.02 to 0.08), suggesting a broadening of the range of treatment modalities offered.
- We found no evidence of impact on mortality or re-admissions, although this may be because the underlying risk of these outcomes was already low.

Research question 5: what is the impact of the London Cancer centralisations on patient experience, including choice and continuity of care?

- Owing to data issues, we could not analyse patient experience quantitatively.
- Qualitative data indicate that London Cancer staff had varied perceptions of impact on patient experience. Although many staff saw improving patient experience as a priority of the changes, they reported logistical challenges in collecting experience data.
- Several staff described patients valuing aspects of the centralised system, including organised specialist care at the centres (e.g. some patients indicated a preference to continue attending the specialist centre rather than a centre closer to home) and new information and support resources.
- Some staff described patients' frustration with aspects of the system, including increased travel to reach the specialist centres, insufficient time for discussions with specialists and disjointedness in the system.

Research question 6: what are the costs and cost-effectiveness of the London Cancer changes?

Our analysis of implementation costs suggested the following:

- The London Cancer changes cost £7.2M to plan, design and implement (adjusted 2017–18 prices). The costs included activities that spread across the wider London Cancer programme, incorporating changes to cancer pathways beyond those studied in this study.
- The highest costs were for equipment (robots), which might not apply in other reconfigurations. The total adjusted cost was £3.2M when robot costs were excluded.
- The framework we used to guide data collection can support stakeholders, including service planners, researchers and policy-makers, to collect and analyse implementation costs, which are often considered too complex to measure or are excluded as sunk costs.

Our health economic analysis, which included the implementation cost, indicated the following:

- There was a medium to high probability of the London Cancer changes leading to more cost-effective treatment provision in prostate cancer (79%), and a medium probability of the same for oesophago-gastric (62%) and bladder (49%) cancer specialist surgery, than services as provided in the rest of England (excluding Greater Manchester) at a standard cost-effectiveness threshold of £30,000 per QALY gained.
- There was a low probability of the London Cancer changes being cost-effective for renal services (12%) at the same cost-effectiveness threshold (i.e. £30,000/QALY gained). It is worth noting, however, that changes to all four pathways took place in tandem and so considering the results separately might not be appropriate.

Research question 7: how might lessons from centralising specialist cancer surgery services apply in future centralisations of specialist cancer services and other specialist settings?

Lessons from our research resonated strongly with workshop attendees who raised the following points:

- With regard to leadership of change, attendees raised questions about managing local resistance, political influences and negotiating meaning of evidence.
- With regard to stakeholder collaboration, attendees discussed the value and challenges inherent in engaging with diverse perspectives. In addition, attendees voiced the importance of contributions of decisive leadership, transparent governance and focusing on patient benefit to align priorities.
- When evaluating change and implications for future work, attendees identified a need to strengthen routine data collection to permit deeper understanding of change and 'future-proofing' of evaluation designs. Attendees urged greater focus on understanding lived experiences of patients and carers throughout the care pathway.

Conclusions

Our analysis of stakeholder preferences suggests that patients, professionals and the public appear to share priorities for MSC. Specifically, stakeholders are willing to accept longer patient travel times for specialist surgery if (but only if) they are associated with significantly better care and outcomes.

Our analysis of what works in terms of quality of care, patient outcomes and cost-effectiveness presented mixed results, reflecting literature that suggested that MSC may improve care and outcomes, but effects vary depending on context. There were clear improvements in LOS and surgeon volumes, but we found no significant improvement in mortality or re-admission rates. Centralising prostate, bladder and oesophago-gastric cancer services had a medium or a medium to high likelihood of being cost-effective, whereas renal changes had a low likelihood of being cost-effective (although these four analyses may need to

be considered together). This study adds to limited evidence on the cost-effectiveness of MSC. We also estimated detailed costs of implementation, which is seldom conducted.

Our analysis of the how and why of implementing MSC extends understanding of leadership, implementation and outcomes of change, providing lessons that may support change in other health-care contexts. Examples include how provider-led networks deliver change of specialist cancer surgery services; how context may both drive and obstruct change; how location and linkage of specialist services, and implications for the wider system (e.g. 'benign' urology services), may prompt clinician resistance; and how competitive bidding and service models may result in feelings of loss and an 'us and them' culture.

Our research suggested implications for future research and the implementation of MSC:

- Strengthening routine data collection in cancer and other settings (including interventions offered, patient experience, quality of life and functional outcomes) would permit more meaningful understanding of the impact of change, as well as other research.
- Mechanisms enabling distribution of leadership and transparency with stakeholders are key to sustaining progress of complex change.
- Greater attention to factors influencing long-term sustainability of change is required, including information technology and managing feelings of loss.
- MSC as attempted by Greater Manchester Cancer and London Cancer is not the only route to delivering high-volume specialist cancer surgery.

Study registration

This study is registered as National Institute for Health and Care Research (NIHR) Clinical Research Network Portfolio reference 19761.

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