

Summary Report for BAPRAS

RESEARCH TITLE: Evaluation of the quality of breast cancer surgery performance across the English NHS through the development of HES-derived quality indicators.

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BACKGROUND

The publication of the Darzi report in 2008 highlighted the importance of the quality of care delivered in the NHS.¹ Darzi emphasised the broad nature of quality of care, and how it encompasses patient experience, effectiveness, and safety.²

Breast cancer is the most common cancer to affect women in the UK, and its incidence is increasing. Fortunately, the prognosis for patients is also improving. Relative 5-year survival in England and Wales has increased from 52% in 1971-1975 to 85.1% in 2005-2009.³ This improvement in survival has been attributed to the evolution of breast cancer treatments and the advent of screening programmes in the 1980s.

The structure of current UK breast cancer care is multifaceted, yet the overarching aims are simple – firstly, to ensure adequate treatment of the breast cancer, and secondly, to provide an integrated breast reconstruction service.⁴ Comprehensive evidence based guidelines have been published to help guide patients onto the appropriate care pathway.⁵ But, despite the availability of these guidelines, patterns of care and patient outcomes have been found to vary across the country.^{6,7,8}

The assessment of the quality of breast cancer care requires attention from all specialities involved. To date, the most frequent quality indicators have focused on oncological processes and outcomes.⁹⁻¹² With the recently oncoplastic guidelines, there is an appreciation that reconstruction services should be integrated into care pathways. However, a robust method to assess the quality of this integrated care has yet to be developed. Such a means would allow performance to be benchmarked in a standardised manner, identify variance, and support quality improvement initiatives to address any variation, or unacceptable outcomes, in line with the new NHS outcomes framework.²

SOURCE OF DATA

A question that arises in the assessment of quality is the feasibility and accuracy of data collection. A readily available and cost-effective source of data is the Hospital Episode Statistics (HES) database.^{13,14} This administrative data source collects details from every hospital admission including patient demographics, and clinical information. Diagnoses are coded using International Classification of Diseases, while procedures are coded using the UK Office for Population Census and Surveys classification. The advantage of HES is that longitudinal patterns of care for individuals can be derived, therefore enabling the monitoring of both short and long-term outcomes. The further benefit of HES is that the database stores multiple diagnosis and procedural codes for each individual patient, thereby offering a means of risk adjustment.

AIMS OF RESEARCH STUDY

In our research, we aimed to develop Hospital Episode Statistics (HES)-derived quality indicators to support the evaluation of the quality of the breast cancer surgery care pathway in the English NHS.

The indicators were selected to address either important clinical areas, or areas of clinical need whereby current evidence is limited. Thus far, three indicators have been investigated in full the results of which are summarised below.

1. Donor-site Hernia Repair rates following Abdominal Flap Breast Reconstruction.

Whilst many donor-site morbidities following abdominal based autologous breast reconstruction can be managed conservatively, the occurrence of a hernia can have serious consequences and further surgery to repair the facial defect may be indicated. Previous estimates of the rate of hernia have varied substantially from 0-16% in TRAM flap procedures to 0-7.1% in DIEP flap procedures.^{15,16} The interpretation of these results, however, is difficult for various reasons, namely the heterogeneous definitions of hernia and methods of assessment. Establishing an expected rate of hernia repair is important for informing patients of the risks,¹⁷ as well as establishing a benchmark quality indicator for service providers.²

Using the HES database, our aim was to investigate the rates of hernia repair following pedicled TRAM (pTRAM), free TRAM (fTRAM) and DIEP flap breast reconstructions in England, and compare outcomes with an age matched control group of women with breast cancer undergoing mastectomy.

Between 2006 and 2012, we identified 7929 women who had a DIEP or TRAM flap breast reconstruction. In women undergoing mastectomy alone, the rate of coincidental hernia repair within 3 years of surgery was 0.28%. In comparison, the 3-year rates for abdominal hernia repair following DIEP, fTRAM and pTRAM flap procedures were 1.65%, 3.18% and 4.91%, respectively. The mean time to hernia repair following abdominal flap harvest was 17.7 months. Among the different types of flap procedures, fTRAMs had an adjusted hazard ratio of 1.81 relative to DIEPs, and pTRAMs had an adjusted hazard ratio of 2.89 relative to DIEPs. We found no evidence of an increased rate of hernia repair for bilateral flap harvest compared to unilateral harvest for each specific flap type.

2. Trends in Immediate Oncoplastic Breast Reconstruction across the English NHS.

The psychosocial impact on women who undergo mastectomy has been widely recognised.^{5,18} In 2002, the National Institute for Health and Clinical Excellence recommended that reconstruction should be discussed with, and available to, all women who are expected for mastectomy. However substantial variation in the uptake of immediate reconstruction (IR) across Cancer Networks was revealed during the 15 month National Mastectomy and Breast Reconstruction audit.^{6,8} Whilst the results were informative, like previous studies, the cause and trajectory of this variation was unknown. Having an accurate picture of service delivery is crucial for the future planning of oncoplastic services, both in terms of funding and resource allocation, but also to facilitate in the identification of underperforming units.²

Using the HES database, we aimed to evaluate how patterns of IR in the English NHS changed from April 2000 to March 2014, a time period when oncoplastic breast cancer services underwent major reconfiguration, substantial funding increase, guideline publication, and a national clinical audit.

A total of 167,343 index mastectomies for breast cancer were identified. The national rate and number of IR procedures was stable at 10% (250 per quarter) until 2005; the IR rate then increased to reach 23% (750 per quarter) by 2013-2014. Using adjusted rates of IR, the level of change in activity was examined over three time points (pre-audit, audit, and post-audit) across Networks. **Figure 1.** Following the audit, all Networks achieved a higher rate of IR, with rates ranging from 13-37% across Networks. However the degree of change was neither uniform, nor greatest as one may expect among those Networks starting with the lowest IR rates. The largest absolute change was actually demonstrated by four Networks that already started with relatively high rates of IR.

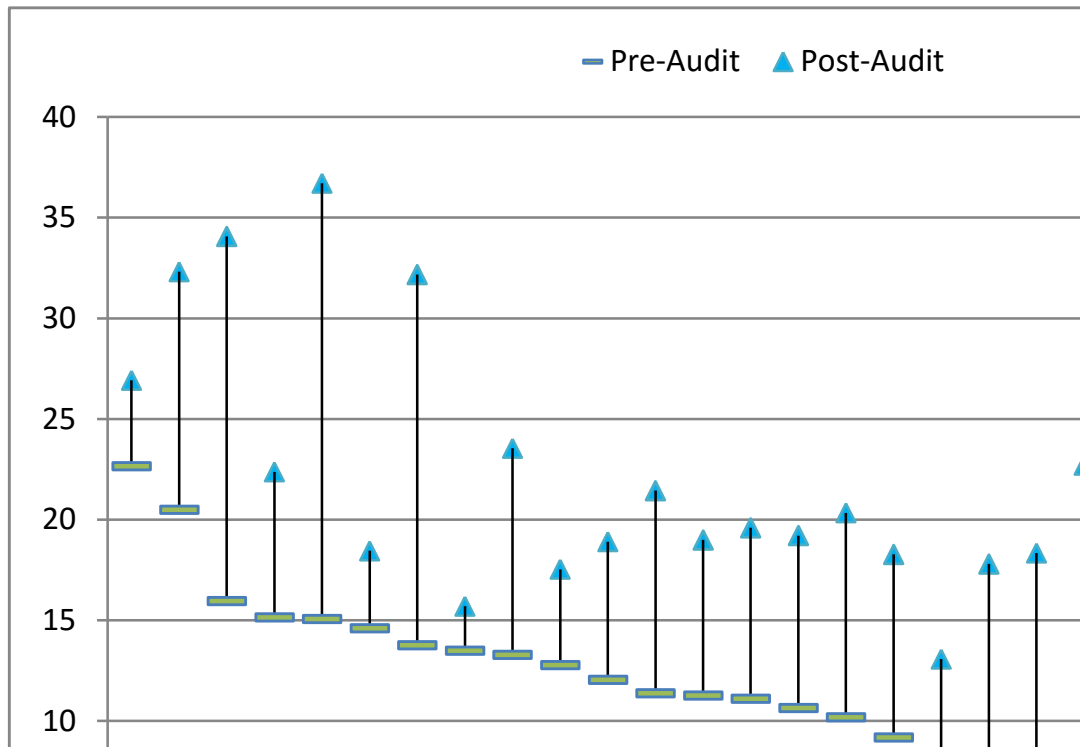


Figure 1: Adjusted Network-level rates of immediate reconstruction during the pre-audit, and post-audit time period. Networks are ordered by their pre-audit rate of immediate reconstruction.

3. The proportion of women who have a breast 4 years after breast cancer surgery.

Women with breast cancer have various potential options to retain their breast after treatment, namely, through breast conserving surgery or mastectomy with reconstruction.^{4,5} However, not all women achieve their initial treatment outcomes. With the multiple interconnected pathways in breast cancer treatment, assessing the care that women receive is complex.¹⁹ Previous studies examining performance have been limited by short follow-up and reporting on only one type of surgical outcome, leading to only a partial understanding of practice.^{7,8,11,12}

In this study, we sought to describe the performance of breast cancer care using a new more comprehensive approach. We determined the proportion of women who have a breast, either through conserving surgery or reconstruction, 4-years from the date of initial breast cancer surgery. Variation was examined across patient groups, and English Cancer Networks.

Between 2008 and 2009, 60,959 women with breast cancer underwent index BCS or mastectomy procedures in English NHS trusts. The proportion with a breast at 4 years was 79.3%, and 64.0%, in women less than 70 years without, and with comorbidities, respectively. Whilst in women aged 70 and over without, and with comorbidities, proportions were 52.6%, and 38.2%, respectively. Network variation of at least 15% was found within each patient group, most significant in those comorbid women 70 years and over. **(Figure 2)** Further, we found that Networks tended to have high or low proportions consistently across all four patient groups.

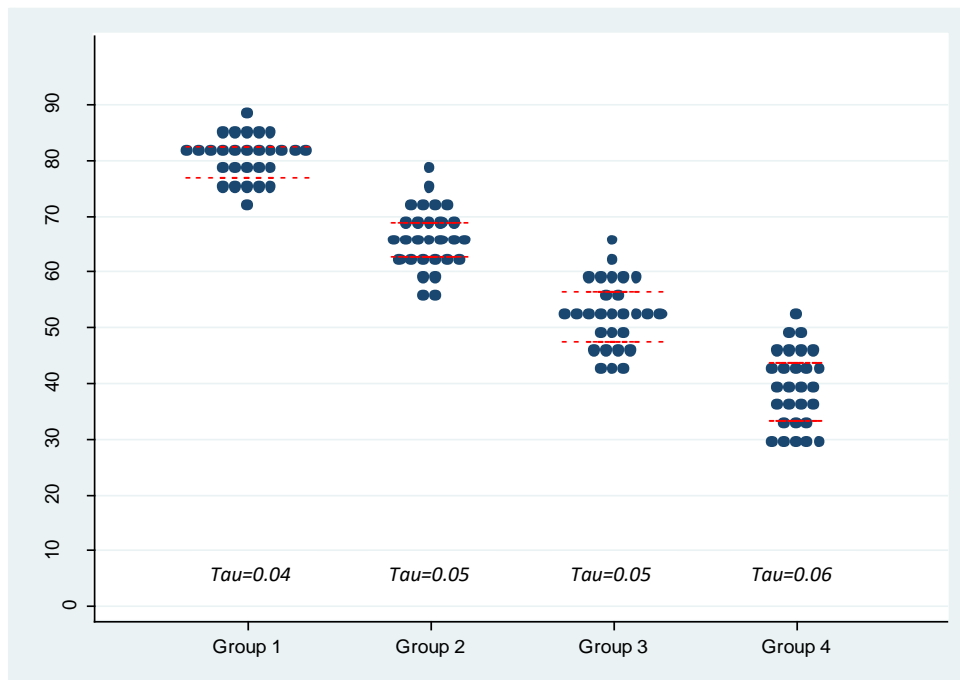


Figure 2: Distribution across Cancer Networks in the proportion of women with a breast 4 years after initial cancer surgery for each patient group. Group 1 = Under 70 years without comorbidities, Group 2 = Under 70 years with comorbidities, Group 3 = Over 70 without comorbidities, Group 4 = Over 70 with comorbidities. The degree of systematic variation within each group is described using an additive overdispersion statistic, tau, the square root of the between-Network variance.

CONCLUSION

The main findings from our work so far suggest that the care women with breast cancer receive is still dependent on their geographical location of treatment. Further, significant variation exists across Cancer Networks in the care of older women that warrants prompt investigation. These results presented can be used as a means of quality assurance assessment and we would encourage breast cancer services to review their performance with the aim of reducing the regional variation. Our study also highlights the need to ensure appropriate mechanisms are put in place to monitor pathways and address inequalities or outlying regions.

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