

Composition, Quoracy and Cost of Specialist Skin Cancer Multidisciplinary Team Meetings in the United Kingdom

Short running head: Composition, Quoracy and Cost of SSMDT's

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Abstract

Background

Multidisciplinary team meetings are an integral component of skin cancer service provision, enabling implementation of evidence-based decisions and standardised patient outcomes.

Objectives

We sought to evaluate the composition, quoracy and cost of Specialist Skin Cancer Multidisciplinary Teams (SSMDT's) in the United Kingdom (UK) to establish the functionality and financial impact of these meetings.

Methods

Cross-sectional design with a national freedom of information request made to 65 NHS trusts in the United Kingdom (UK) hosting a SSMDT. Detailed information regarding attendance frequency and core membership from attendance registers was requested. Quoracy was measured against the 2006 National Institute for Health and Care Excellence (NICE) Cancer Services standard 'Improving outcomes for people with skin tumours including melanoma'. We costed the SSMDT utilising the running time, core membership salaries derived from national pay scales and overhead values provided by trusts.

Results

Out of 58 respondents (89% response rate), only 15 SSMDT's (26%) were quorate by membership. 40 SSMDT's (69%) were quorate by meeting frequency. The main reasons for membership non-compliance was lack of clinical oncology presence. There was a large variation in the cost per patient (μ =£132.68, range £31.67-£313.10). There was geographical variation in quoracy or cost between England, Wales, Scotland and Northern Ireland.

Keywords: Basal cell carcinoma; squamous cell carcinoma; melanoma; skin cancer; MDT; service provision.

Introduction

Since the Calman-Hine report in 1995 highlighted inadequacies in cancer care, and the National Health Service (NHS) Executive Group mandated that all cases of cancer should be managed by an MDT, they have been a core component of patient management in the United Kingdom (UK).^{1,2,3} MDT working has been shown to reduce variations in care, by standardising practise with evidence-based decisions, reduce waiting times for treatment, and improve the patient experience.⁴⁻⁷ Despite these advantages, the current MDT process has been shown to be time consuming, expensive, and inefficient.^{8, 9} In England, over 55,000 MDT meetings take place each year.¹⁰ The contribution of NHS consultants' time to these meetings has been estimated at 1.2 million hours or 550 full-time equivalents, with a total cost of £154.3 million.^{10, 11} There is insufficient contemporary evidence to determine whether MDT working is cost-effective within the context of secondary care due to the small number of studies with a high risk of bias, in addition to poor reporting on the definition of MDT operationalisation and transparent costs (administering, preparing and attending).¹² A common example of MDT inefficiency is multiple case re-discussions, with over 10% of new patients requiring more than one discussion.¹¹ Reasons for re-discussion include lack of contemporaneous clinical or specialist advice, imaging or investigations at the primary meeting, referral from one site-specific MDT to another or abnormal test results during the course of their management or regular follow-up. Composition and quoracy are key features of cancer MDT operationalisation that are yet to be adequately addressed by the literature.¹³⁻¹⁷

Skin cancer is the most common cancer in the UK, comprising at least 25% of all new cancer diagnoses.^{18, 19} There are over 16,000 new melanoma and 147,000 new non-melanoma cases diagnosed every year, with over 200,000 annual excisions performed at significant cost to the NHS.¹⁸⁻²⁰ Incidence rates for melanoma skin cancer are projected to rise by 7% in the UK between 2014 and 2035, resulting in 32 cases per 100,000 people by 2035.¹⁹ The large caseloads of Local Skin Cancer Multidisciplinary Teams (LSMDT's) and Specialist Skin Cancer Multidisciplinary Teams (SSMDT's) contribute enormously to the national MDT workload. Despite this, there is a paucity of literature within the field of skin oncology examining costs, quality, and efficiency of skin cancer MDT work. If the NHS is to cope with the increased number of patients and associated cost implications, then it is important that these

data are available to help the NHS consider how services can be optimised and re-configured to meet demand. Central to understanding these operational aspects of MDT working includes ensuring that the different specialties represented are in attendance and able to participate in discussion. The primary aim of this study was to assess national SSMDT composition and attendance against a quorum with the secondary aim to analyse the total costs of administering, preparing and attending a SSMDT.

Patients and methods

Freedom of information (FOI) requests were sent to all National Health Service trusts across the United Kingdom to identify those with a SSMDT in July 2019. Any site holding a SSMDT were then sent a more detailed electronic FOI request asking for details regarding frequency, attendance, preparation time, running time, dissemination time, number of new cases, number of re-discussions and whether videoconferencing was used between sites (Appendix A). The quorum for frequency and attendance has been previously defined by cancer indicators derived from the Manual for Cancer Services: Skin Measures v 2.0 National Cancer Peer Review (NCPR), National Cancer Action Team 2011 which is based on the National Institute for Health and Clinical Excellence (NICE) standard Improving outcomes for people with skin tumours including melanoma and Cancer Services Guidelines 2006.^{21, 22} In the context of this study, quorum was therefore defined as a SSMDT 1) Occurring weekly and 2) Core membership attendance based on ≥ 1 x dermatologist, ≥ 1 x surgeon, ≥ 1 x clinical oncologist, ≥ 1 x medical oncologist, ≥ 1 x histopathologist, ≥ 1 x imaging specialist, 1 x skin nurse specialist and 1 x MDT coordinator.

Our costing methodology was based on core membership attendance records. Hourly rates were calculated from the Standard NHS Agenda for Change salary points, with preparation, running, and dissemination time factored in.²³ Overheads including heating, lighting and information technology support were expressed as a percentage of total operating costs. We calculated total SSMDT cost and cost per patient based on the calculation of overheads + (mean hourly salary cost core SSMDT members x total preparation, running and dissemination time SSMDT core members).

Descriptive and statistical data analysis were performed using Microsoft Excel 2010® (Microsoft Cooperation, Redmond, Washington USA) and IBM SPSS Statistics for Windows (version 24, IBM Corp, Armonk, NY) respectively. The chi-square (X^2) test was used to test the hypothesis of no difference in frequencies among England, Wales, Scotland and Northern Ireland. Furthermore, the F-statistic was used for testing the hypothesis of no differences among the means of total cost and cost per patient. $p < 0.05$ was considered statistically significant.

The study was approved by the clinical audit department of our institution (ID number: MH2).

Results

There were 58 respondents (89% response rate) to the FOI request. A heat map demonstrating national distribution of SSMDT respondents with regional variation in total patients discussed at SSMDT's is shown in Figure 1. The majority (69%) of SSMDT's were held in venues holding teaching hospital status.

Composition and quoracy

Of the respondents 18 (31%) reported on parent speciality of the SSMDT chair: 1 oral and maxillofacial surgery (OMFS) (6%), 2 clinical oncology (11%), 3 plastic surgery (17%) and 12 dermatology (67%). With respect to surgical presence, the frequency of ≥ 1 consultant in attendance at the SSMDT from plastic surgery, OMFS, ear, nose and throat and general surgery was 43 (74%), 12 (21%) and 4 (7%) and 2 (3%) respectively. Only 15 SSMDT's (26%) were quorate by membership. Forty SSMDT's (69%) were quorate by meeting frequency. Ascending frequency of core membership role non-attendance is shown in Figure 2. The most common reason for a lack of membership quoracy was a lack of clinical oncology presence. There was no geographical variation in frequency or attendance quoracy, and this was not statistically significant ($X^2 = 6.71$, $p = 0.08$). Fifteen (26%) SSMDT's hosted videoconferencing facilities at the time of the data request. Post-hoc analysis

showed weak positive correlation with attendance quoracy and SSMDT's who had videoconferencing facilities, although this was not statistically significant (Phi coefficient = +0.13, $p = 0.07$). There was a statistically significant weak positive correlation with the specific attendance quoracy for clinical oncology and teaching hospital status (Phi coefficient = +0.28807, $p = 0.02825$).

Cost analysis

Twenty-four SSMDT's were able to provide data towards a costing analysis. The mean total cost for an SSMDT was £3,963.68 (£946.12-£9,353.94). The mean cost per patient was £132.68 (£31.67-£313.10). There was a weak positive correlation with cost per patient and total number of patients discussed (Pearson correlation coefficient -0.2767, $p = 0.0766$), suggesting that those SSMDT's who discuss more people at each meeting bring the unit cost per patient down, although this was not statistically significant. There was a large range in overheads, mean 12.65% (8.86%-17.60%). The geographical variations in costing and total SSMDT running times are shown in Figures 3 and 4. The mean number of total cases discussed was 30 (12-50), with 10 re-discussed cases (32.7%) (0-41 [0-88%]). There was no geographical variation in either total or per patient cost ($F = 1.82$, $p = 0.169$ and $F = 0.40$, $p = 0.757$ respectively). We calculated the baseline cost of a quorate SSMDT at £2,380.41 based on these mean values. Assuming a 52 week per a year service, we used this mean value to extrapolate the total annual cost of all quorate SSMDT's in the UK as £8,045,802.70.

Discussion

MDT working is considered the gold standard for cancer patient management, with the aim of promoting best practice and reduced variation in access to treatment.²⁴ Data validation, audit and education are other important secondary functions. The healthcare landscape has drastically changed since their inception with increasing demands placed upon MDT's with complex treatment pathways, and an increasing range of imaging modalities and pharmacotherapeutic options. This has resulted in MDT's becoming resource intensive and costly to the NHS. This is reflected in the total cost of MDT's rising rapidly, from £88 million in 2011/12 to £159 million in 2014/15,

driven by a rapid rise in activity.²⁵ This has not been matched by a growth of overall staff numbers attending MDT's.²⁶ Costs in this study were related to the number of people discussed at each meeting. The mean unit cost per discussion at the SSMDT in this study was £132.68 which is comparative to previous work reporting cost per discussion varying between £91.84 for breast cancer and £132.95 for colorectal cancer.²⁵ There was a relatively high rate of case re-discussion in this study which highlights some of the inefficiencies of cancer MDT working. Previous work has shown that over 10% of new patients need more than one discussion due to insufficient clinical information at the initial meeting and complex presentations needing multiple site-specific MDT input and to discuss abnormal investigations.¹⁰

Previous work has demonstrated that skin cancer MDTs are costly, especially considering they last for an average of two hours, with opportunity costs ranging from £129,134 (\pm 25% range, £96,851 to £161,418) and £258,268 (\pm 25% range £193,701 to £322,835) per network per annum.²¹ This cost is due to interdisciplinary nature and the co-location of senior specialists in several spheres, which also impacts on several consultant job plans.

In addition to cost, other shortcomings of current MDT practise have been highlighted in the Cancer Research UK (CRUK) commission investigating the effectiveness of MDT meetings in cancer services which was aimed at improving the effectiveness of MDT meetings in cancer services.²⁵ The crucial findings from this report included the lack of sufficient time to discuss complex patients, suboptimal meeting attendance, not utilising the right information to inform discussions, and MDTs not being able to fulfil their secondary roles. One of the most valuable features of MDT meetings is the diversity in terms of specialities represented, contributing to a meaningful discussion and a range of opinion and interpretation. With an estimated 50,000 shortfall in NHS clinical staff in England reported as of 2014, recruitment for specific clinical positions becomes harder.²⁷ Specifically, this was expanded on by CRUK in relation to imaging, endoscopy, and pathology capacity.²⁸⁻³⁰ These challenges increase pressure on MDT meetings drastically, specifically among non-surgical specialities, including oncologists, pathologists and radiologists who are often core members of multiple MDTs.⁴ This could explain the pattern of core membership quoracy differences we observed in this study.

The recent COVID-19 pandemic has resulted in the need to take a fresh view of current practice, and due to the economic restrictions and reduction of footfall in clinical areas, it is timely to review efficiency and seek out novel avenues to deliver services. Institutions are now routinely performing video conferencing and using modern technologies to maintain MDT functioning. It is intuitive that information communication technology (ICT) should positively impact on cancer MDT meetings, however there is little evidence to support this conventional wisdom.

Qualitative work has reported that improving real time data collection and feedback has the potential to improve quality, care coordination, and patient-centered models of care.³¹ The Multidisciplinary meeting Assistant and Treatment sElector (MATE) is an example of a clinical decision support (CDS) system with potential to be more widely used.³² CDS are defined as systems that are designed to directly aid clinical decision-making, with the characteristics of an individual patient on an electronic health record matched to a computerized clinical knowledge base, and patient-specific assessments or recommendations are then presented to the clinician(s) and/or the patient for a decision.³

Limitations

We used the Manual for Cancer Services: Skin Measures v 2.0 National Cancer Peer Review (NCPR), National Cancer Action Team 2011, which is based on the NICE standard Improving outcomes for people with skin tumours including melanoma and Cancer Services Guidelines 2006. We acknowledge that the national requirements for MDTs vary across the four UK nations, as do the processes for their assessment, albeit some elements of similarity. According to the NCPR, now referred to as the Quality Surveillance Team (QST), the attendance at each individual MDT should constitute a quorum, for 95% or more, of the meetings.²² Additionally, we acknowledge limitations inherent to the study design. This study is a cross-sectional study and only calculated quoracy at one given time point. An accurate measure of quoracy reflects calculation across an entire calendar year prior to the internal annual quality assurance assessment.²²

Conclusion

This novel study using an FOI study design to report observational data of national SSMDT working, is the first study to objectively measure the composition, quoracy and cost of Specialist Skin Cancer Multidisciplinary Team (SSMDT) meetings in the United Kingdom. The majority of SSMDT's in the UK are meeting at the required frequency, however they are not meeting the standards for attendance. The most common reason is the lack of clinical oncology presence. SSMDT's are costly to the NHS, and strategies need to be developed to mitigate this or revolutionise efficiency. This should be taken into consideration by the NHS England's QST, the Scottish Intercollegiate Guidance Network, and the National Cancer Standards for Wales and Northern Ireland Cancer Registry for future policy changes. Future research will build on these findings by using a comparative analysis with different models of MDT working to investigate cost-effectiveness and improve efficiency.

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Institutional ethical approval: None.

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Supporting Information

Appendix A: FOI request sent to all SSMDT's.

- Venue
- All staff present based on attendance records
- Time spent by each team member in preparing for the SSMDT meeting
- Time spent by team coordinator preparing for and disseminating SSMDT outcome
- Running time in minutes of the SSMDT
- Overheads as a percentage of total operating costs from the most recent financial year
- Number of new cases discussed
- Number of re-discussions discussed (re-discussion defined as any patient discussed at the same point in their pathway but following an additional test or any patient brought back to MDT for re-discussion of the same test results)
- Were any videoconferencing facilities used across sites?

Figure Legends

Figure 1: Heat map demonstrating distribution of SSMDT respondents and total number of patients discussed at SSMDT's regionally.

Table 1: Frequency of core membership role non-compliance contributing to non-quorate SSMDT's. CNS; clinical nurse specialist.

Table 2: Breakdown of costing analysis by geography.

Table 3: Total SSMDT time across the UK.

Figure 1: Heat map demonstrating distribution of SSMDT respondents and total number of patients discussed at SSMDT's regionally

[Click here to access/download;Figure\(s\);Heat map final without percentage.jpg](#)

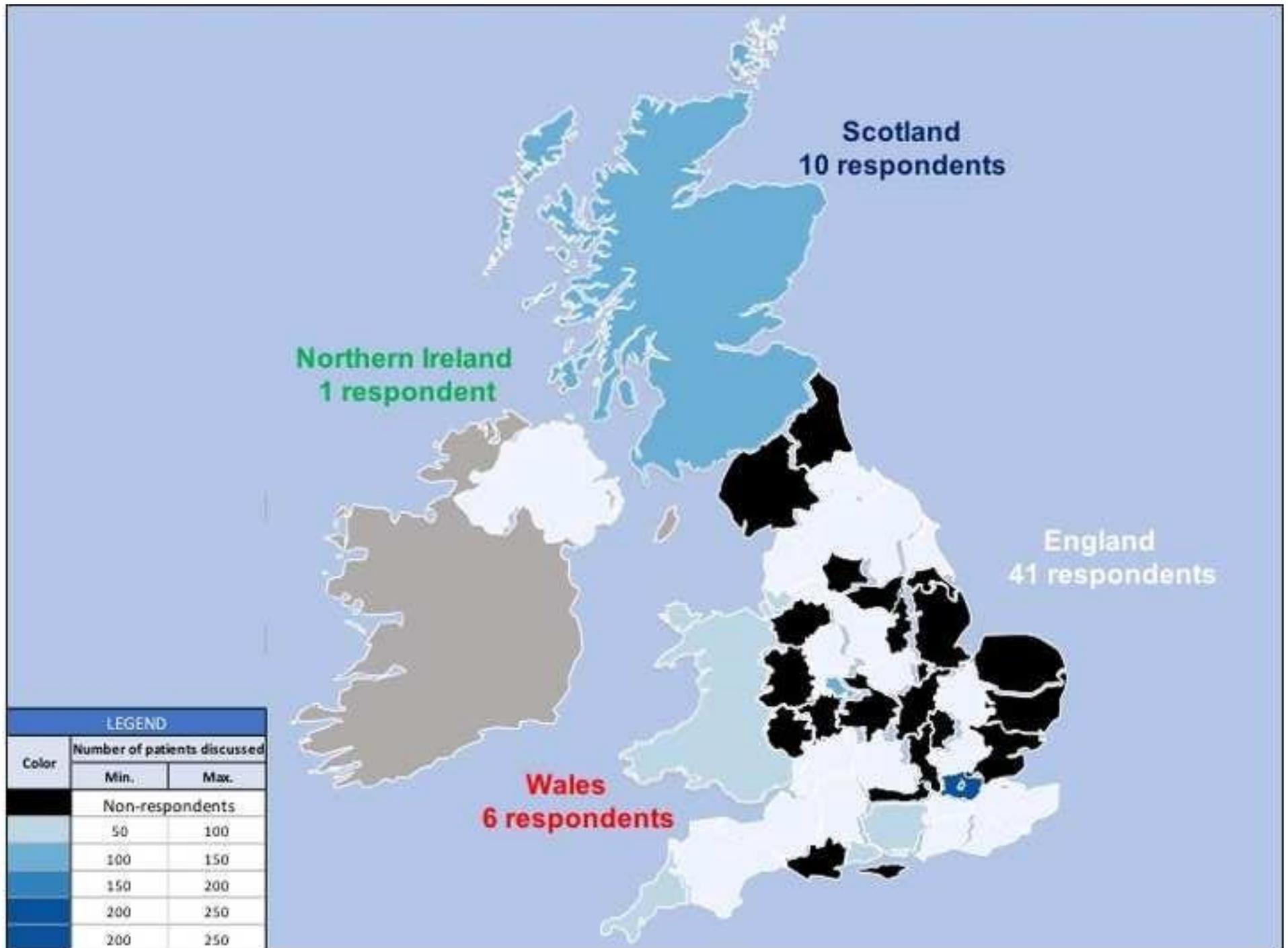


Table 1: Frequency of core membership role non-compliance contributing to non-quorate SSMDT's.

Core membership role	Absolute non-compliance frequency count	Percentage expressed as proportion of all SSMDT's
Consultant Clinical Oncologist (<1)	34	59%
Consultant Medical Oncologist (<1)	13	22%
Consultant Radiologist (<1)	11	19%
MDT Co-ordinator (<1)	6	10%
Consultant Dermatologist (<1)	3	5%
Total Consultant Surgeon (<1)	3	5%
Skin cancer CNS (<1)	2	3%
Consultant Histopathologist (<1)	1	2%

CNS; clinical nurse specialist.

Table 2: Breakdown of costing analysis by geography.

Costing Measure	Overall	England	Wales	Scotland	Northern Ireland
Mean overhead % (£)	12.65 (444.02)	12.64 (431.31)	12.75 (317.10)	12.08 (122.39)	12.75 (736.34)
Mean total SSMDT cost (£)	3,963.68	3852.90	2,804.19	1,135.98	6,511.58
Mean per patient cost (£)	132.68	145.84	155.79	53.14	166.96

Table 3: Total SSMDT time across the UK.

	Preparation time (hours)	Running time (hours)	Dissemination time (hours)
Mean	10.2	1.45	5
Minimum	0	0.5	0
Maximum	38.5	3	37.5