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Characterising trends in the initiation, timing, and completion of recommended summary plan for emergency care and treatment (ReSPECT) plans: Retrospective analysis of routine data from a large UK hospital trust

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Abstract

Aim: To assess patient socio-demographic and disease characteristics associated with the initiation, timing, and completion of emergency care and treatment planning in a large UK-based hospital trust.

Methods: Secondary retrospective analysis of data across 32 months extracted from digitally stored Recommended Summary Plan for Emergency Care and Treatment (ReSPECT) plans within the electronic health record system of an acute hospital trust in England, UK.

Results: Data analysed from ReSPECT plans (n = 23,729), indicate an increase in the proportion of admissions having a plan created from 4.2% in January 2019 to 6.9% in August 2021 (mean = 8.1%). Forms were completed a median of 41 days before death (a median of 58 days for patients with capacity, and 21 days for patients without capacity). Do not attempt cardiopulmonary resuscitation was more likely to be recorded for patients lacking capacity, with increasing age (notably for patients aged over 74 years), being female and the presence of multiple disease groups. 'Do not attempt cardiopulmonary resuscitation' was less likely to be recorded for patients having ethnicity recorded as Asian or Asian British and Black or Black British compared to White. Having a preferred place of death recorded as 'hospital' led to a five-fold increase in the likelihood of dying in hospital.

Conclusion: Variation in the initiation, timing, and completion of ReSPECT plans was identified by applying an evaluation framework. Digital storage of ReSPECT plan data presents opportunities for assessing trends and completion of the ReSPECT planning process and benchmarking across sites. Further research is required to monitor and understand any inequity in the implementation of the ReSPECT process in routine care.

Keywords: Acute setting, Emergency care, Treatment planning, Advance care planning, Routine data

Introduction

In recent years, an approach to inform emergency care and treatments of adults and children across health and care settings in the UK has been developed, known as the Recommended Summary Plan for Emergency Care and Treatment (ReSPECT) process. The ReSPECT process was developed by the Resuscitation Council UK and is designed to facilitate proactive discussions about a person's options and preferences for care and treatment in the event of serious illness. This would inform decisions should they lack the mental capacity to engage in decision-making. This includes decisions relating to cardiopulmonary resuscitation (CPR). Historically, UK localities relied on standalone do-not-attempt resuscitation orders, but an increasing number of organisations are adopting ReSPECT or similar treatment escalation planning processes.[1] The ReSPECT process is underpinned by conversations between the patient and clinicians to inform realistic treatment preferences,

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leading to clear recommendations recorded by clinicians.[2] The approach is intended to guide care and treatment in the event of serious clinical deterioration across all settings, including palliative and end-of-life care.[3] The ReSPECT process however exists in a noisy landscape of approaches for discussing and documenting advance and future care planning.[4] There is limited evidence reported on its use and recognised variation in the way that the ReSPECT process influences practice, including inconsistent conversations surrounding the process.[5]

ReSPECT sits within the envelope of broader Advance Care Planning (ACP), focusing on context-specific clinical recommendations, such as emergency care, treatment, and cardiopulmonary resuscitation. ACP is '. . .a process that supports adults at any age or stage of health in understanding and sharing their personal values, life goals and preferences regarding future medical care'.[6] ACP involves determining what people want to happen in the delivery of their future care (advance status of wishes and preferences), what people do not want to happen (including advance decisions to refuse treatment), and who will speak on their behalf if needed (proxy or lasting power of attorney). Internationally, different approaches to support documentation and sharing of advance care plans have been explored, including Portable Medical Orders, formerly Physician Orders for Life-Sustaining Treatment (POLST), in the United States.[7] Care is largely concordant with preferences documented on POLST forms,[8] but there remains a limited evidence base underpinning their use, including how they influence care delivery and any potential unintended consequences.[9]

The rollout and implementation of ReSPECT in the UK has occurred in more than one-quarter of acute hospitals,[10] with increasing coverage across geographical regions.[11] ReSPECT seeks to improve the identification of people, including children and young people, at risk of life-threatening clinical deterioration to offer relevant ACP.[12] It is therefore important to monitor and appraise its implementation. This need was emphasised during the first wave of the COVID-19 pandemic when in the context of rapidly developed new guidance regarding escalation, evidence indicated increased documentation of recommendations to not administer CPR for some ethnic minority groups with approximately one in five patients not being consulted regarding CPR recommendations in hospital settings.[13] The primary aim of this study was to assess patient sociodemographic and disease characteristics associated with the initiation, timing, and completion of emergency care and treatment planning in a large UK-based hospital trust. A secondary aim was to develop a systematic framework that identifies patterns of the completion, timing, and characteristics of patients with ReSPECT plans.

Methods

Study design

A secondary retrospective analysis using data extracted from ReSPECT plans stored within the electronic health record system of an acute hospital trust in England, UK.

Study setting

The study took place using data collected from Leeds Teaching Hospital Trust (LTHT), one of the largest acute hospital trusts in the UK. The Trust comprises five hospitals and provides healthcare and specialist services for the population of Leeds and the surrounding region of Yorkshire and the Humber, alongside specialist services that can be accessed nationally. Details of ReSPECT plan implementation at LTHT is available in Appendix A. Under a data-sharing agreement, deidentified data for all ReSPECT plans recorded between 1st January 2019 to 31st August 2021 were extracted by a data quality officer in the informatics team at LTHT and shared in a secure data environment at the University of Leeds. Details of data extraction, preparation and cleaning can be found in Appendix A.

Statistical analysis

Five questions guided analysis of data: 1) How many ReSPECT plans are being created and how has the proportion of plans changed over time? 2) What are the characteristics of people who receive a ReSPECT plan? 3) Which sociodemographic characteristics are associated with the completeness of ReSPECT plans? 4) Which patient sociodemographic and clinical characteristics are associated with documented resuscitation decisions? 5) Is documentation of the hospital as a preferred place of death associated with dying in hospital? For the data analysis, both Microsoft Excel (Office Professional 2016) and R version 4.2.3 were used. Data was explored using descriptive statistics to report sociodemographic characteristics of the patients (see Appendix A for the list of variables), recorded preferences for cardiopulmonary resuscitation, and information regarding who administered ReSPECT stratified by recorded capacity (questions 1 and 2). Chi-squared tests were used for categorical variables and t-tests for the continuous variable to assess whether patients with capacity and without capacity statistically differ from each other in terms of sociodemographic characteristics and recorded preferences.

The completeness of each ReSPECT plan was coded into one of four categories based on the extent of fields completed (see Appendix C for further detail): Mandatory (minimal data required to record a ReSPECT plan (i.e., nature of patient (or proxy) involvement in agreeing on the plan, and a documented cardiopulmonary resuscitation recommendation), Level 1 (minimally useful additional content recorded), Level 2 (intermediate completion), and Level 3 (comprehensive completion). Binary logistic regression was used to assess which variables predicted completeness of records (as completed at a Level (Level 1, Level 2 or Level 3) versus mandatory level) with a subset of data including patients over 17 years old (question 3).

Binary logistic regression was used to assess which variables predicted a recording of Do Not Attempt CPR (DNACPR) (question 4), where a subset of the data was used for this analysis. This subset of data included patients who were at least 18 years old and for whom a CPR decision was recorded (question 4). Different regression models were used to assess greatest model fit. The best fit was chosen based on lower Akaike Information Criteria (AIC).[14] Some regression models included interaction terms to assess whether there was interaction between independent variables used. In regression models, cases with missing values for the variables used were deleted.

Binary logistic regression was also used to assess which variables predicted hospital death (died in LTHT- yes/no) with the data from all patients who had died and had a documented place of death (question 5). Missing values are presented as counts in Appendix B. All regression modelling adjusted for age and collinearity checks were performed to suggest that any confounding would have very little impact.

The reporting of the study is aligned with the STROBE checklist.[15] This research was undertaken as part of service evaluation work to inform a programme of work within LTHT and Leeds Palliative Care Network relating to ReSPECT implementation. As a service evaluation, and with data sharing agreements in place, the project was excluded from Health Research Authority approval.

Results

In total, content from 33,895 ReSPECT plans was received. Of these, plans that were either the sole existing or most recent active plan for a patient were used (n = 23,729). Most records contained one, single plan (n = 18,640), with fewer patients having two or more saved iterations of the plan.

Trends in the creation of ReSPECT plans over 32 months

Trends in the number of records created each month over 32 months can be seen in Fig. 1a. There were consistently over 600 records created each month, with an increase in the number of ReSPECT plans documented in the early months of the COVID-19 pandemic from March to June 2020. As shown in Fig. 1b, there was also an increase in the number of recorded ReSPECT plans as a proportion of all admissions (see Appendix D for monthly values). Whilst there was a surge during 2020, the proportion of plans increased from 4.2% in January 2019 to 6.9% in August 2021 ($\bar{x}$ = 8.1%). Fig. 1c indicates that the number of records created during weekdays is consistently higher than those created during weekends, with most plans recorded during daytime working hours. For decedents (n = 16,154/23,729; 68.0% of all patients), plans were recorded a median of 41 days (IQR 7, 206.5) before death.

Recipients of ReSPECT plans and recorded preferences

Sociodemographic information on patients and documentation of items is presented in Table 1. More than half of all recorded ReSPECT plans (61.8%) were for patients aged over 74 years, with 207 patients (0.9%) under the age of 20. There were more females (52.6%) than males (47.4%), with most plans created by White British patients (88.9%). Compared to all admissions during the same period (Appendix E), there was a greater proportion of patients with a ReSPECT plan that were older (61.3% with ReSPECT plan aged 75 + vs 19.3% of all admissions) and recorded as White ethnicity (89.2% vs 77.4%). When compared to all admissions that died within one year (Appendix E) there is alignment for age and ethnicity, but differences by sex for females (47.3% died vs 52.6% with ReSPECT plans) and males (52.7% died vs 47.4% with ReSPECT plans).

A total of 50.3% of patients with ReSPECT plans were living in areas of most or high levels of deprivation (i.e. IMD levels 1 and 2). The majority of patients (64.4%) had mental capacity. A small proportion (1.2%) of patients with capacity declined direct involvement in a ReSPECT discussion, accepting recommendations made by a clinician in conjunction with identified advocates. The existence of LPA for health and welfare was “unknown” for most plans (75.9%).

When compared to patients with mental capacity to agree on recommendations, ReSPECT plans for those who lacked capacity were more likely to be for people who were: over the age of 74 years (72.3 versus 56.7% who had capacity), female (54.3 versus 51.8% with capacity), had non-White ethnicity recorded (12.4 versus 10% with capacity), not an inpatient at the time the plan was created (10.6 versus 7.6% with capacity), have an LPA documented (6.6 versus 1.8% with capacity), and have an undecided preferred place of care (49.1 versus 36.5% with capacity) and death (57.6 versus 51.2% with capacity). Plans for those without capacity were more likely to document not for attempted CPR (97.9 versus 79.4% with capacity), with a shorter median number of days from creating a plan to death (21 versus 58 days with capacity). For those with DNACPR recorded, 22.4% (n = 4,511) were alive or discharged at the time of the study (see Appendix F).

Recording of broader ACP information was limited. Preferred place of care was documented in 37.0% (8,775/23,729) of plans, and pre-

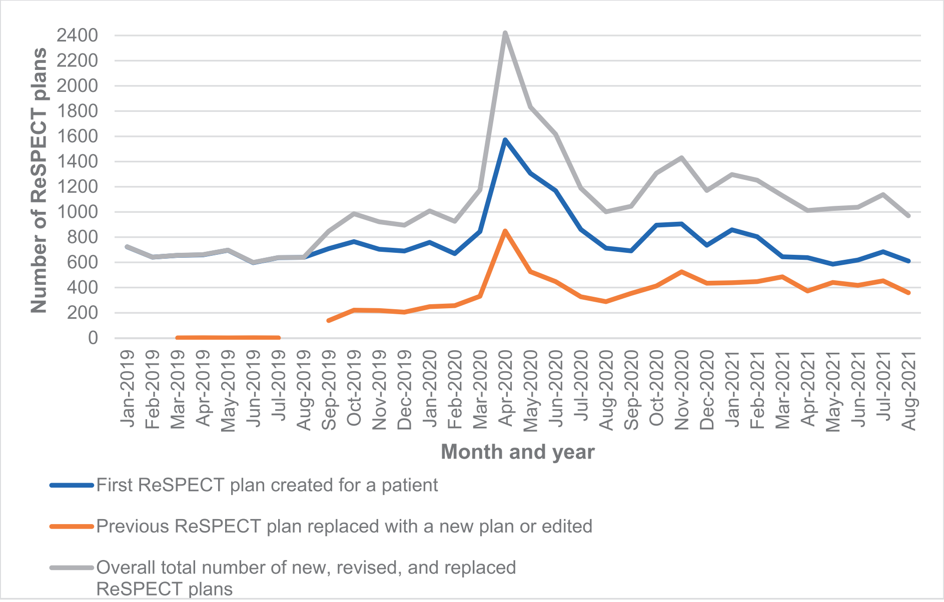

Fig. 1a – Trends in the number of new ReSPECT plans, update of records and the total number of records by each month over 32 month period.

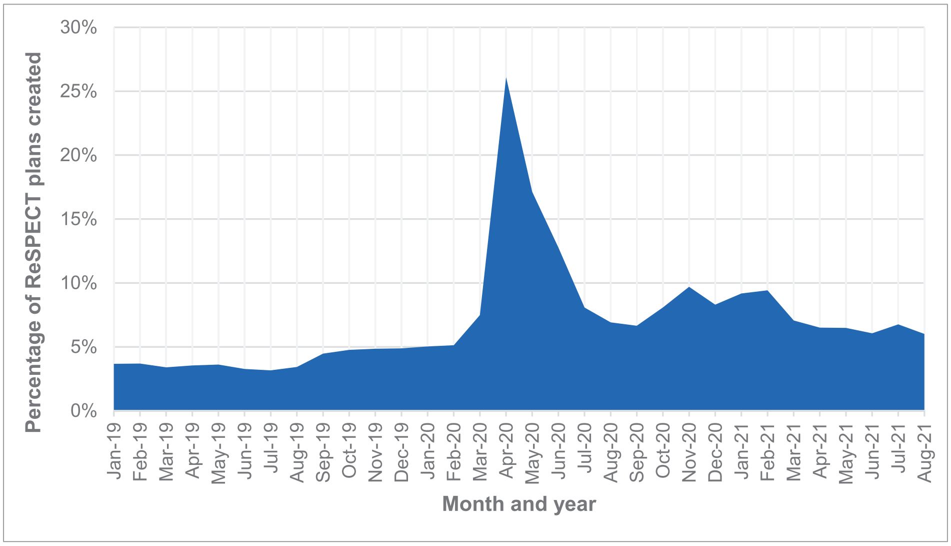

Fig. 1b – Trends in the percentage of people with a ReSPECT plan within the total number of people admitted to the hospital trust over 32 months.

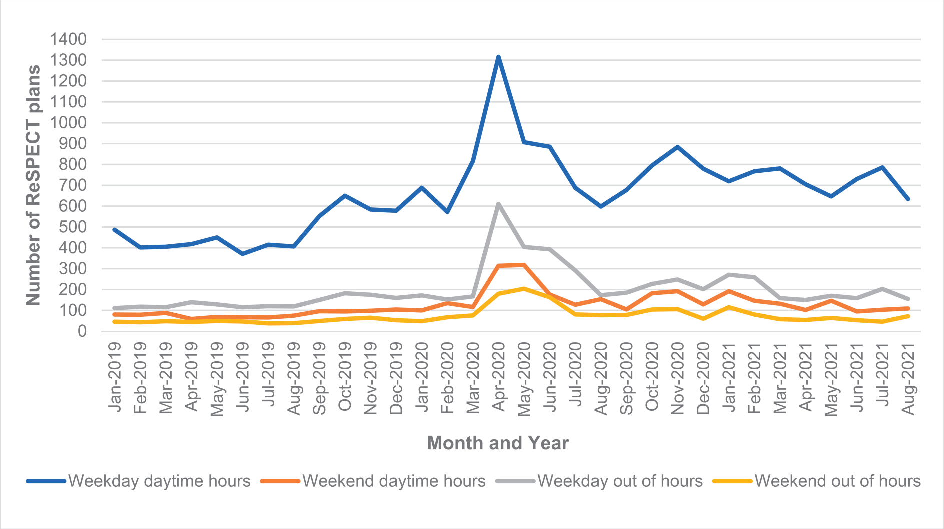

Fig. 1c – Trends in the number of ReSPECT plans created during normal hours across weekdays and weekends, alongside out-of-hours on weekdays and weekends over 32 months.

ferred place of death in 33.4% (7,917/23,729). For both categories, 'undecided' was most recorded (e.g., 53.5% (4,233/7,917) for preferred place of death). DNACPR in the event of cardiac arrest was recorded in 85.9% (20,153/23,729) of plans. There was variation across each month with > 35% of forms recommending CPR during the first three months of the COVID-19 pandemic (see Appendix G). Free-text treatment escalation recommendations commonly related to interventions within the hospital setting (i.e., 58.5% of all plans). Treatment escalation information was documented less for treatment outside the hospital setting (4.7%) and for hospital readmission (16.4%).

Completeness of recorded ReSPECT plans

Fig. 2 reflects data on levels of completion across all iterations of ReSPECT plans. A total of 14,138 (41.2%) contained only mandatory information. Most others were at Level 1 (minimally useful) (n = 16,220; 47.1%). Fewer than 10% of plans included Level 2 (intermediate) (n = 2,878; 8.2%) or Level 3 (comprehensive) (n = 1,161; 3.4%).

Factors influencing completeness

Demographic information stratified according to the completeness of ReSPECT plans can be found in Appendix H. Logistic regression (see Table 2) was used to explore the relationship between sociodemographic variables and completeness (complete at any level versus mandatory items only). Table 2 shows that for the study population (i.e. people with a ReSPECT plan), there was a significant increase in the likelihood of having only mandatory level items completed in plans for patients in age categories of either 18 to 49 or over 74 years compared to being 50–74 years, being female, having ethnicity recorded "Other" compared to White, and living in less deprived

Table 1 – Sociodemographic information of patients and documentation of items relating to the ReSPECT stratified by recorded mental capacity.

Data category	Level	Overall	Had capacity	Lacked capacity	p
n		N = 23,729	15,278	8,274	
Age (%)	0–49	1933 (8.1)	1391 (9.1)	370 (4.5)	<0.001
	50–74	7143 (30.1)	5221 (34.2)	1922 (23.2)	
	75+	14,653 (61.8)	8666 (56.7)	5982 (72.3)	
Sex (%)	Female	12,470 (52.6)	7911 (51.8)	4491 (54.3)	<0.001
	Male	11,259 (47.4)	7367 (48.2)	3783 (45.7)	
Ethnicity (%)	White	21,089 (88.9)	13,754 (90.0)	7248 (87.6)	<0.001
	Mixed	121 (0.5)	87 (0.6)	27 (0.3)	
	Asian or Asian British	815 (3.4)	438 (2.9)	326 (3.9)	
	Black or Black British	422 (1.8)	269 (1.8)	145 (1.8)	
	Other	1282 (5.4)	730 (4.8)	528 (6.4)	
Life status (%)	Alive	7575 (31.9)	5955 (39.0)	1596 (19.3)	<0.001
	Died	16,154 (68.1)	9323 (61.0)	6678 (80.7)	
Indices of multiple deprivation quintiles (%)	1 (most deprived)	8582 (36.2)	5406 (35.4)	3089 (37.4)	0.003
	2	3341 (14.1)	2172 (14.2)	1138 (13.8)	
	3	4096 (17.3)	2688 (17.6)	1387 (16.8)	
	4	4579 (19.3)	2922 (19.1)	1631 (19.7)	
	5 (least deprived)	3116 (13.1)	2083 (13.6)	1021 (12.4)	
Died in hospital (%)	Yes	8467 (52.4)	4218 (45.2)	4173 (62.5)	<0.001
	No	7689 (47.6)	5106 (54.8)	2506 (37.5)	
Inpatient (%)	Yes	21,658 (91.3)	14,118 (92.4)	7397 (89.4)	<0.001
	No	2071 (8.7)	1160 (7.6)	877 (10.6)	
Lasting power of attorney (LPA) for health and welfare documented (%)	Yes	824 (3.5)	275 (1.8)	549 (6.6)	<0.001
	No	4710 (20.0)	2670 (17.5)	2040 (24.7)	
	Clinician recorded as unknown	18,022 (76.5)	12,333 (80.7)	5685 (68.7)	
Patient has insight into their illness (%)	Yes	9224 (39.3)	8752 (57.4)	472 (5.7)	<0.001
	No	3445 (14.7)	240 (1.6)	3205 (39.0)	
	Clinician recorded as unknown	10,799 (46.0)	6261 (41.0)	4537 (55.2)	
Carer has insight into patient illness (%)	Yes	7268 (31.0)	3584 (23.5)	3684 (44.9)	<0.001
	No	401 (1.7)	120 (0.8)	281 (3.4)	
	Clinician recorded as unknown	15,787 (67.3)	11,542 (75.7)	4244 (51.7)	
Preferred place of Care (%)	Care-home	267 (3.0)	101 (1.7)	166 (5.5)	<0.001
	Home	2848 (32.5)	2161 (37.4)	687 (22.9)	
	Hospice	363 (4.1)	293 (5.1)	70 (2.3)	
	Hospital	1505 (17.2)	1015 (17.6)	490 (16.3)	
	Other	211 (2.4)	98 (1.7)	113 (3.8)	
	Undecided	3581 (40.8)	2107 (36.5)	1474 (49.1)	
Preferred place of death (%)	Care-home	220 (2.8)	74 (1.4)	146 (5.2)	<0.001
	Home	2161 (27.3)	1590 (31.0)	571 (20.5)	
	Hospice	600 (7.6)	507 (9.9)	93 (3.3)	
	Hospital	535 (6.8)	256 (5.0)	279 (10.0)	
	Other	168 (2.1)	74 (1.4)	94 (3.4)	
	Undecided	4233 (53.5)	2628 (51.2)	1605 (57.6)	
CPR Recommendation (%)	Yes for CPR	3237 (13.8)	3078 (20.2)	159 (1.9)	<0.001
	No formal decision made	83 (0.4)	69 (0.5)	14 (0.2)	
	No for CPR	20,153 (85.9)	12,110 (79.4)	8042 (97.9)	
CPR Discussed with (%)	Carer or family member	8038 (34.3)	876 (5.8)	7161 (87.3)	<0.001
	Patient	14,539 (62.1)	14,250 (93.7)	289 (3.5)	
	Urgent decision	838 (3.6)	83 (0.5)	755 (9.2)	
Days from ReSPECT plan creation to death (median [IQR])		41.00 [7.00, 206.50]	58.00[14.00,239.00]	21.00[3.00,160.00]	<0.001
Number of diseases recorded (%)	0	1894 (10.4)	1207 (10.5)	680 (10.2)	<0.001
	1	8119 (44.4)	5314 (46.1)	2768 (41.5)	
	2	4534 (24.8)	2761 (23.9)	1750 (26.2)	

(*continued on next page*)

Table 1 (continued)

Data category	Level	Overall	Had capacity	Lacked capacity	p
	3	2398 (13.1)	1446 (12.5)	943 (14.1)	
	4	951 (5.2)	579 (5.0)	369 (5.5)	
	5	305 (1.7)	179 (1.6)	123 (1.8)	
	6+	88 (0.5)	50 (0.5)	38 (0.5)	
Documentation of treatment escalation plans (%)					
Treatment escalation relating to hospital readmission (%)	Blank	19,828 (83.6)	12,583 (82.4)	7166 (86.6)	<0.001
	Free-text data present	3900 (16.4)	2694 (17.6)	1108 (13.4)	
Treatment escalation relating care within hospital (%)	Blank	9853 (41.5)	6265 (41.0)	3554 (43.0)	0.004
	Free-text data present	13,876 (58.5)	9013 (59.0)	4720 (57.0)	
Treatment escalation relating ‘Other’ (%)	Blank	22,614 (95.3)	14,588 (95.5)	7904 (95.5)	0.901
	Free-text data present	1115 (4.7)	690 (4.5)	370 (4.5)	
Treatment escalation relating to care outside hospital (%)	Blank	22,608 (95.3)	14,519 (95.0)	7966 (96.3)	<0.001
	Free-text data present	1121 (4.7)	759 (5.0)	308 (3.7)	
Treatment escalation relating potentially reversible conditions (%)	Blank	22,103 (93.1)	14,181 (92.8)	7802 (94.3)	<0.001
	Free-text data present	1626 (6.9)	1097 (7.2)	472 (5.7)	
Treatment escalation relating intensive care unit (%)	Blank	14,075 (59.3)	8923 (58.4)	5053 (61.1)	<0.001
	Free-text data present	9654 (40.7)	6355 (41.6)	3221 (38.9)	
Completion levels (N = 23,729) (%)	Mandatory fields only	9272 (39.1)	5774 (37.8)	3321 (40.1)	<0.001
	Level 1 (Minimally useful	11417 (48.1)	7395 (48.4)	4022 (48.6)	
	Level 2 (Intermediate)	2197 (9.3)	1505 (9.9)	692 (8.4)	
	Level 3 (Comprehensive)	843 (3.46)	604 (4.0)	239 (2.9)	

areas (IMD levels 4 and 5) compared to the most deprived areas (see Table 3).

Factors influencing cardiopulmonary resuscitation recommendations

Logistic regression was used to explore factors influencing a significant increase in the likelihood of a DNACPR recommendation being recorded. DNACPR was more likely to be recorded for patients lacking capacity, with increasing age (notably for patients aged over 74 years) and being female. DNACPR was less likely to be recorded for patients having ethnicity recorded as Asian or Asian British and Black or Black British compared to White. DNACPR was also more likely for records with a specific disease recorded. The exception was COVID-19, where having COVID-19 documented was associated with an increased likelihood of a recommendation for CPR (OR = 2.14, 95 CI [1.77, 2.59]).

Relationship between documented place of death and likelihood of hospital death

Most patients who had a ReSPECT plan died (n = 16,154;68.1%), with the majority dying in hospital (n = 8,467;52.4%). For patients who died with a ReSPECT plan, 62.2% (n = 10,045) were missing a preferred place of death. For patients who died with a ReSPECT plan and without a preferred place of death recorded, 65.5% (n = 5,546) died in hospital. Duration from ReSPECT plan creation to death or study period end (for patients that were still alive) was explored (see Appendix I). For most patients who died in hospital, a ReSPECT plan was created within one month of death (68.3%). For those who died outside hospital, the largest category (23.8%) was those who died between 1 and 3 months after the creation of a ReSPECT plan. ReSPECT plans were created for most patients who were alive at the end of the study period (59.3%) 12 or more months before the study end period.

A sub-analysis was conducted on data for all patients who had died and had a documented place of death (n = 6,109) (see Table 4). Having a preferred place of death recorded as hospital leads to a five-fold increase in the likelihood of dying in hospital. Other factors that may increase the likelihood of a hospital death are for patients where their plan records that a carer does not have insight into the patient’s illness or the carer’s insight is unknown.

Discussion

Use of ReSPECT plans increased since initial implementation with most patients having a single iteration of a plan, suggesting that

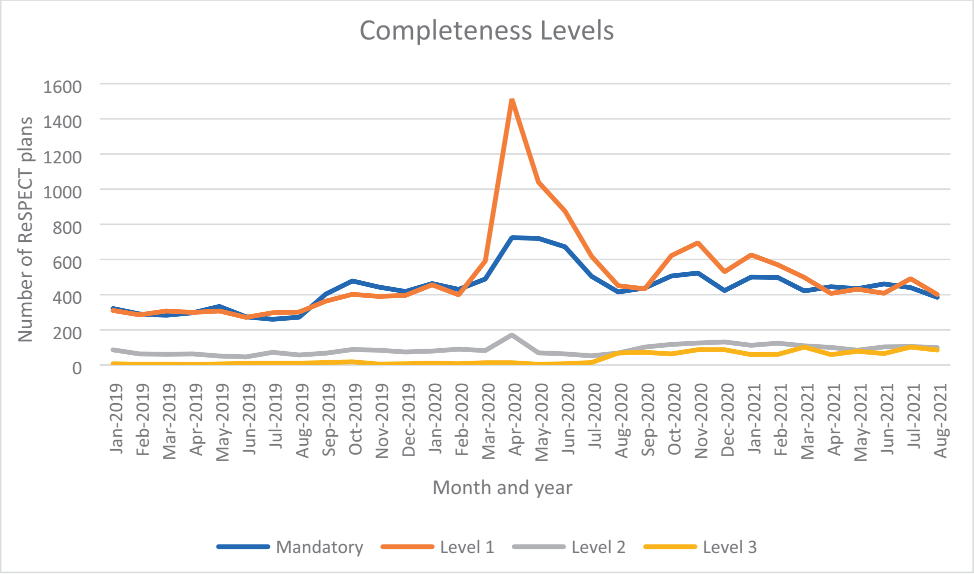

Fig. 2 – Completeness of ReSPECT plan content across levels of Mandatory (minimal data required to record a ReSPECT plan (i.e., nature of patient involvement in content recorded in the plan, and a documented cardiopulmonary resuscitation recommendation), Level 1 (minimally useful additional content recorded), Level 2 (intermediate completion), and Level 3 (comprehensive completion).

Table 2 – Logistic regression exploring factors influencing completeness only at a mandatory level. Number in data frame = 21477, Number in model = 21464, Missing = 13, AIC = 28471.6, C-statistic = 0.55, H&L = Chi-sq (8) 12.22 (p = 0.141).

Dependent: Completeness		At Levels 1, 2 or 3	Mandatory	OR (univariable)	OR (multivariable)
Age Category	50–74	4402 (66.3)	2237 (33.7)		
	18–49	976 (58.3)	698 (41.7)	1.41 (1.26–1.57, p < 0.001)	1.39 (1.24–1.55, p < 0.001)
	75+	7849 (59.6)	5315 (40.4)	1.33 (1.25–1.42, p < 0.001)	1.31 (1.23–1.39, p < 0.001)
Sex	Male	6529 (63.8)	3709 (36.2)		
	Female	6698 (59.6)	4541 (40.4)	1.19 (1.13–1.26, p < 0.001)	1.17 (1.10–1.23, p < 0.001)
Ethnicity	White	11,846 (61.9)	7304 (38.1)	–	–
	Mixed	63 (58.3)	45 (41.7)	1.16 (0.79–1.70, p = 0.452)	1.16 (0.79–1.71, p = 0.445)
	Asian or Asian British	423 (60.3)	279 (39.7)	1.07 (0.92–1.25, p = 0.391)	1.10 (0.94–1.29, p = 0.217)
	Black or Black British	237 (63.5)	136 (36.5)	0.93 (0.75–1.15, p = 0.508)	0.99 (0.79–1.22, p = 0.901)
	Other	658 (57.5)	486 (42.5)	1.20 (1.06–1.35, p = 0.003)	1.24 (1.10–1.40, p = 0.001)
IMD	1 (Most deprived)	4857 (63.0)	2857 (37.0)	–	–
	2	1832 (61.2)	1163 (38.8)	1.08 (0.99–1.18, p = 0.085)	1.08 (0.99–1.17, p = 0.101)
	3	2305 (61.7)	1433 (38.3)	1.06 (0.98–1.15, p = 0.178)	1.04 (0.96–1.13, p = 0.314)
	4	2533 (60.6)	1647 (39.4)	1.11 (1.02–1.19, p = 0.011)	1.08 (1.00–1.17, p = 0.043)
	5 (Least deprived)	1693 (59.7)	1144 (40.3)	1.15 (1.05–1.25, p = 0.002)	1.13 (1.04–1.24, p = 0.005)

Table 3 – Logistic regression exploring factors influencing recording not for CPR. Number in data frame = 23462, Number in model = 16487, Missing = 6975, AIC = 7484.3, C-statistic = 0.876, H&L = Chi-sq(8) 39.88 (p < 0.001).

Dependent: CPR Recommendation	Levels	For attempted CPR	Do Not Attempt CPR (DNACPR)	OR (univariable)	OR (multivariable)
Capacity	Had capacity	2880 (20.6)	11,124 (79.4)	–	–
	Lacked capacity	142 (1.9)	7184 (98.1)	13.10 (11.08–15.61, p < 0.001)	12.99 (10.47–16.29, p < 0.001)
Age	18–49	1006 (60.9)	645 (39.1)	–	–
	50–74	1557 (23.6)	5037 (76.4)	5.05 (4.50–5.66, p < 0.001)	4.65 (3.95–5.49, p < 0.001)
	75+	459 (3.5)	12,626 (96.5)	42.90 (37.48–49.19, p < 0.001)	33.10 (27.35–40.15, p < 0.001)
Sex	Female	1306 (11.7)	9856 (88.3)	–	–
	Male	1716 (16.9)	8452 (83.1)	0.65 (0.60–0.71, p < 0.001)	0.82 (0.73–0.92, p = 0.001)
Ethnicity	White	2385 (12.5)	16,643 (87.5)	–	–
	Mixed	42 (39.6)	64 (60.4)	0.22 (0.15–0.33, p < 0.001)	0.57 (0.30–1.07, p = 0.076)
	Asian or Asian British	222 (31.9)	473 (68.1)	0.31 (0.26–0.36, p < 0.001)	0.47 (0.36–0.62, p < 0.001)
	Black or Black British	129 (34.8)	242 (65.2)	0.27 (0.22–0.34, p < 0.001)	0.49 (0.34–0.70, p < 0.001)
	Other	244 (21.6)	886 (78.4)	0.52 (0.45–0.60, p < 0.001)	0.87 (0.68–1.11, p = 0.245)
Dementia	Yes	121 (5.2)	2206 (94.8)	–	–
	No	1594 (11.3)	12,566 (88.7)	0.43 (0.36–0.52, p < 0.001)	0.64 (0.51–0.80, p < 0.001)
Cancer	Yes	242 (6.1)	3734 (93.9)	–	–
	No	1473 (11.8)	11,038 (88.2)	0.49 (0.42–0.56, p < 0.001)	0.24 (0.20–0.28, p < 0.001)
Haematological Disease	Yes	60 (10.3)	523 (89.7)	–	–
	No	1655 (10.4)	14,249 (89.6)	0.99 (0.75–1.29, p = 0.929)	0.62 (0.44–0.84, p = 0.003)
COPD	Yes	128 (7.1)	1679 (92.9)	–	–
	No	1587 (10.8)	13,093 (89.2)	0.63 (0.52–0.76, p < 0.001)	0.59 (0.48–0.73, p < 0.001)
Heart Failure	Yes	148 (6.9)	1995 (93.1)	–	–
	No	1567 (10.9)	12,777 (89.1)	0.60 (0.51–0.72, p < 0.001)	0.63 (0.52–0.77, p < 0.001)
Frailty	Yes	189 (5.2)	3468 (94.8)	–	–
	No	1526 (11.9)	11,304 (88.1)	0.40 (0.34–0.47, p < 0.001)	0.50 (0.42–0.60, p < 0.001)
Neurological Diseases	Yes	26 (8.3)	286 (91.7)	–	–
	No	1689 (10.4)	14,486 (89.6)	0.78 (0.51–1.14, p = 0.228)	0.59 (0.37–0.93, p = 0.027)
Covid19	Yes	288 (27.6)	756 (72.4)	–	–
	No	1427 (9.2)	14,016 (90.8)	3.74 (3.23–4.33, p < 0.001)	2.14 (1.77–2.59, p < 0.001)
Liver Disease	Yes	15 (7.0)	198 (93.0)	–	–
	No	1700 (10.4)	14,574 (89.6)	0.65 (0.37–1.06, p = 0.109)	0.34 (0.18–0.60, p < 0.001)

either plans were not reviewed after creation or were reviewed but not amended. When compared to all admissions, patients with ReSPECT plans were older with a larger proportion of White ethnicity recorded, although similar to admissions that died within one year. Among patients who had died, plans were created a median of 41 days before death ($\tilde{x}$=58 days for people with capacity, $\tilde{x}$=21 days for those without capacity). The majority (>80%) of plans recommended DNACPR. Lacking capacity, increasing age (notably aged over 74 years), and being female significantly increased the likelihood of a DNACPR recommendation. DNACPR was less likely to be recorded for patients having ethnicity recorded as Asian or Asian British and Black or Black British compared to White. Plans with COVID-19 recorded as a disease were twice as likely to recommend CPR. Lower completeness of plans was more likely for patients aged 18 to 50, or over 74 years, having ‘Other’ as recorded ethnicity, being female, and from least deprived areas. Only a third of

Table 4 – Factors influencing the likelihood of hospital death. Number in data frame = 6109, Number in model = 6074, Missing = 35, AIC = 7570, C-statistic = 0.728, H&L = Chi-sq(8) 125.42 ($p < 0.001$). CPR = cardiopulmonary resuscitation.

		Died in hospital			
		No	**Yes**		
Place	Other	3121 (55.0)	2556 (45.0)	–	–
	hospital	69 (16.0)	363 (84.0)	6.42 (4.97–8.42, p < 0.001)	5.18 (3.95–6.88, p < 0.001)
Capacity	Had capacity	2271 (59.4)	1555 (40.6)	–	–
	Lacked capacity	919 (40.3)	1364 (59.7)	2.17 (1.95–2.41, p < 0.001)	1.21 (0.96–1.52, p = 0.111)
Age Category	0–49	134 (47.2)	150 (52.8)	–	–
	50–74	1082 (51.8)	1008 (48.2)	0.83 (0.65–1.07, p = 0.147)	1.09 (0.83–1.44, p = 0.519)
	75+	1974 (52.9)	1761 (47.1)	0.80 (0.63–1.01, p = 0.066)	1.10 (0.84–1.44, p = 0.505)
Sex	Female	1674 (54.9)	1377 (45.1)	–	–
	Male	1516 (49.6)	1542 (50.4)	1.24 (1.12–1.37, p < 0.001)	1.21 (1.09–1.35, p = 0.001)
Ethnicity	White	2921 (53.0)	2594 (47.0)	–	–
	Mixed	10 (50.0)	10 (50.0)	1.13 (0.46–2.75, p = 0.791)	1.09 (0.40–2.95, p = 0.868)
	Asian or Asian British	67 (43.5)	87 (56.5)	1.46 (1.06–2.03, p = 0.021)	1.15 (0.81–1.64, p = 0.424)
	Black or Black British	41 (44.1)	52 (55.9)	1.43 (0.95–2.17, p = 0.091)	1.28 (0.82–2.00, p = 0.276)
	Other	151 (46.2)	176 (53.8)	1.31 (1.05–1.64, p = 0.017)	1.05 (0.82–1.35, p = 0.699)
Index of Multiple Deprivation (IMD)	1-Most deprived	1072 (49.5)	1092 (50.5)	–	–
	−2	444 (51.6)	417 (48.4)	0.92 (0.79–1.08, p = 0.314)	0.94 (0.79–1.11, p = 0.467)
	−3	542 (53.5)	471 (46.5)	0.85 (0.73–0.99, p = 0.037)	0.87 (0.74–1.02, p = 0.094)
	−4	673 (54.2)	568 (45.8)	0.83 (0.72–0.95, p = 0.008)	0.87 (0.75–1.02, p = 0.078)
	5-Least deprived	459 (55.6)	367 (44.4)	0.78 (0.67–0.92, p = 0.003)	0.77 (0.64–0.91, p = 0.003)
Inpatient when ReSPECT form created	Yes	2914 (52.9)	2592 (47.1)	–	–
	No	276 (45.8)	327 (54.2)	1.33 (1.13–1.58, p = 0.001)	1.25 (1.04–1.50, p = 0.018)
LPA for health and welfare recorded or unknown	yes	181 (60.5)	118 (39.5)	–	–
	no	814 (46.3)	945 (53.7)	1.78 (1.39–2.29, p < 0.001)	1.77 (1.34–2.33, p < 0.001)
	unknown	2195 (54.2)	1856 (45.8)	1.30 (1.02–1.65, p = 0.034)	1.41 (1.09–1.85, p = 0.010)
Recorded that patient has insight into their illness	yes	1948 (59.8)	1310 (40.2)	–	–
	no	489 (39.3)	755 (60.7)	2.30 (2.01–2.63, p < 0.001)	1.32 (1.07–1.63, p = 0.008)
	unknown	753 (46.9)	852 (53.1)	1.68 (1.49–1.90, p < 0.001)	1.30 (1.10–1.53, p = 0.002)
Recorded that carer has insight into their illness	yes	1644 (53.6)	1421 (46.4)	–	–
	no	42 (25.8)	121 (74.2)	3.33 (2.35–4.82, p < 0.001)	2.11 (1.43–3.16, p < 0.001)
	unknown	1500 (52.2)	1375 (47.8)	1.06 (0.96–1.17, p = 0.259)	1.34 (1.18–1.51, p < 0.001)
Resuscitation Recommendation	Yes for CPR	38 (62.3)	23 (37.7)	–	–
	No formal decision made	9 (75.0)	3 (25.0)	0.55 (0.11–2.07, p = 0.405)	0.25 (0.01–3.90, p = 0.348)

(*continued on next page*)

Table 4 (continued)

		Died in hospital			
		No	**Yes**		
	No for CPR	3143 (52.1)	2893 (47.9)	1.52 (0.91–2.59, p = 0.114)	0.89 (0.50–1.61, p = 0.683)
Who resuscitation recommendation was discussed with	Carer or family member	955 (42.1)	1312 (57.9)	–	–
	Patient	2169 (59.8)	1457 (40.2)	0.49 (0.44–0.54, p < 0.001)	0.69 (0.55–0.86, p = 0.001)
	Urgent decision	59 (28.6)	147 (71.4)	1.81 (1.33–2.50, p < 0.001)	1.50 (1.07–2.12, p = 0.021)
Days to death	Mean (SD)	178.4 (230.7)	77.6 (177.4)	1.00 (1.00–1.00, p < 0.001)	1.00 (1.00–1.00, p < 0.001)

all plans had ACP information, including preferences around place of care and death. Plans for patients aged 18 to 50, or over 74 years, with ‘other’ as recorded ethnicity, who are female, and from least deprived areas were less comprehensively completed. LPA for health and welfare were “unknown” for most plans.

Around 5 – 10% of all admissions had a ReSPECT plan created, with more than half recorded for patients in the age group 75 + years old, aligned with findings on the increasing relevance of advance care planning for hospital-based acute medical care with increasing age.[16] During the first wave of the COVID-19 pandemic, there was a spike in the proportion of admissions with a completed ReSPECT plan. Having COVID-19 recorded as a diagnosis increased the likelihood of having ‘For attempted CPR’ recorded as opposed to DNACPR. Documentation of DNACPR preferences during the pandemic has subsequently been scrutinised, with mixed findings relating to the influence of socio-demographic factors such as ethnicity and deprivation. In the US, for example, white race and higher deprivation were associated with having a do not resuscitate order.[17] In the UK, Asian ethnicity was associated with a lower use of early DNACPR.[18] This study found that patients with ‘other’ ethnicity were less likely to have comprehensively completed ReSPECT plans. ‘Asian or Asian British’ or ‘Black or Black British’ ethnicity however had an increased likelihood of having for CPR documented. These findings align with international evidence indicating that people from minoritised ethnic groups have a preference for life-sustaining and aggressive treatments at the end of life, and are less likely to have formally documented advance care plans.[19,20] Clinicians may believe there are a greater number of barriers to conducting discussions with patients from minoritised ethnic groups about CPR preferences (e.g., a patient’s previous experiences of racism and discrimination, language and communication, uncertainty over family decision-making processes, and religious imperatives to preserve life at all costs).[21] This study additionally identified that the study population (i.e. people with a ReSPECT plan) comprised a majority of patients with the highest levels of deprivation. Of patients with a ReSPECT form, those from the highest levels of deprivation were also more likely to have higher levels of completeness in their plans. We are not clear on the underpinning reasons for the greater representation of high deprivation across patients with a ReSPECT plan, though this may reflect known associations between low socioeconomic position and hospitalisation towards the end of life.[22] Further exploration of trends relating to ReSPECT plans and their association with socio-demographic factors is needed to determine gaps in the aims of the ReSPECT approach and its implementation in practice.[5]

Multiple benefits were derived from digital-stored ReSPECT plans in this research project, incorporated into the hospital’s electronic health record system.[23] This study was able to apply a replicable and scalable framework whilst addressing a need for better utilisation of routine data to understand care delivery.[24] Previous research has largely relied on qualitative, survey, case note and mixed-method approaches.[10,25–32] Digital ReSPECT data enables comparisons across other hospital and community settings to be developed to enable benchmarking (e.g., the proportion of patients with ReSPECT forms, equitable creation of ReSPECT forms irrespective of socio-demographic and disease characteristics) which in turn may stimulate quality improvement.[33] It also provides opportunities to explore low-cost and readily scalable approaches to promote conversations about future care and to inform targeted interventions for groups who have lower completion rates (e.g., ‘other’ ethnicity, female, lower age) such as conversation prompts and suggested topics and phrases for conversations.[34]

This study had limitations, with some missing data, and being limited to one site, albeit one of the largest acute trusts in England. In this study, the majority of plans were created within weekday working hours compared to out-of-hours. This may be more conducive to a planned approach to ReSPECT conversations supported by a team that is familiar with the patient, senior clinicians, and those people important to the patient. Nonetheless, it has been questioned whether acute hospital admissions provide an acceptable setting for ACP discussions. Evidence is mixed, with patients finding ACP discussions difficult during an acute illness, while others find them more relevant during this time.[35] This has led to increasing interest in the implementation of ReSPECT in community settings, enabling the facilitation of conversations during admission or shortly after discharge when a patient may be more clinically stable and less likely to have an acute compromise of mental capacity. Future research is required to reflect activity in the community setting and to develop a more comprehensive understanding of the uptake and completion of plans created across different settings.

Conclusions

Multiple sociodemographic and disease characteristics are associated with the initiation, timing, and completion of ReSPECT plans. These reflect variations in how the approach is being used in routine practice. At an early stage of implementation, the framework used within the study provides a means of determining engagement with and completion of the ReSPECT planning process across sites, monitoring any disparities in their use, and potentially enabling benchmarking of practice. This may help to inform how the ReSPECT process is implemented to support timely access to information to guide the care and treatment of people in the event of serious clinical deterioration across all settings.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary data

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