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Original Research

Preventable deaths related to thromboembolism in England and Wales, 2013-2022: A systematic case series of coroners' reports

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ABSTRACT

Objectives: To identify preventable thromboembolism-related deaths, classify coroner concerns, and explore organisational responses.
Study design: Retrospective systematic case series of coroners' Prevention of Future Deaths reports (PFDs) from 1 July 2013 to 16 November 2022, in England and Wales.
Methods: Reports were acquired from the Courts and Tribunals Judiciary website and screened for thromboembolism-related deaths using a reproducible automated computer code. Demographic information, coroners' concerns, and organisational responses to PFDs were extracted and analysed, including risk factors predisposing to thromboembolism.
Results: 112 PFDs (2.7 % of all PFDs) involved a thromboembolism event contributing to death. The average age of death was 59 years, corresponding to an estimated median of 25 years of life lost per death. Just over half of deaths occurred in women (52 %). The most common cause of death was pulmonary embolism (85.7 %). Issues with thromboprophylaxis were common, including incorrect risk assessments (27.7 %). Coroners' concerns most often related to failures in providing adequate care, including communication failures (15.7 %), issues with following protocols and guidelines (11.8 %), and risk assessments (10.8 %). Only 56 % of organisations who were sent a PFD had a published response. When they did respond, the majority of responses reported initiating changes related to improvements to guidelines and protocols, or education and training.
Conclusions: PFDs offer unique insights into the systems and processes leading to preventable thromboembolism-related deaths. Improved awareness and dissemination of PFDs among clinicians and policy-makers, alongside routine monitoring of PFDs, has the potential to improve patient safety and reduce preventable harms from thromboembolic events.

1. Introduction

Between April 2023 and April 2024, there were 13,260 deaths where venous thromboembolism was present on the death certificate in the United Kingdom (UK), with hospital-acquired venous thromboembolism forming a large proportion of preventable thromboembolism and associated morbidity and mortality.[1,2] Thrombosis, the process by which blood clots form, can occur in both the venous[3] and arterial circulatory systems.[4] In some cases these clots can dislodge (embolise) and travel to other sites, such as the lungs, causing pulmonary embolism.[5] Underlying medical conditions, periods of immobility, and use of certain medications can all predispose to thromboembolic disease, which causes significant morbidity and mortality globally.[6,7]

The prevention of thromboembolism is therefore a key pillar of

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patient safety, both in inpatient hospital care and in community settings. In 2021, the National Thrombosis Survey, published by Thrombosis UK in collaboration with the Getting it Right First Time (GIRFT) programme, identified 13 % of hospital-acquired venous thromboembolism (VTE) as being preventable, with most being due to inadequate thromboprophylaxis.[8] Twelve (3 %) of these preventable VTEs led to fatal pulmonary embolism (PE). However, potentially preventable blood clots also occur in other settings, including care homes and the community, where the burden of disease may be considerable, but data remains sparse.[9] While not all clots are preventable, little is known about the systems and processes which go wrong in practice leading to preventable deaths from thromboembolism.

Coroners in England and Wales have a duty to report and communicate a death when the coroner believes that action should be taken to prevent similar deaths.[10,11] This communication results in the writing of a Prevent Future Deaths (PFD) report that is sent to an individual or organisation who has the power to act. These reports are cited as an official source of data for the NHS Patient Safety Strategy,[12] however there is no public information that demonstrates their routine use by NHS organisations. Thus, the concerns raised by coroners in PFDs about thromboembolism-related deaths remain poorly explored and disseminated, missing opportunities for systemic learning.

In this study we aimed to conduct a systematic case series of PFDs in order to describe and characterise thromboembolism-related deaths, collate coroners concerns, and analyse the responses of organisations to whom these PFDs were addressed.

2. Methods

2.1. Study design

A systematic case series of coroners' Prevent Future Death (PFD) reports was designed, and the study protocol was preregistered on an open repository.[13]

2.2. Data collection, screening, and eligibility

Reports were acquired from the Courts and Tribunals Judiciary website[14] on 16 November 2022 using an openly available and reproducible web scraper[15] designed by a study author (FD). The scraper was used to automatically download all portable document format (pdf) reports that were then searched using pre-determined keywords. Keywords were chosen after discussion among the study authors, based on preliminary exploration of PFD reports, established literature nomenclature, and clinical knowledge. Both thromboembolism and haemorrhage were included in the same initial search. The keywords chosen included 'clot', 'clots', 'embolism', 'thromboembolism', 'emboli', 'embolisms', 'embolus', ''thrombosis', 'thromboses', 'thrombi', 'clotting', 'clotted', 'thromboembolic', 'coagulation', 'coagulant', 'bleed', 'bleeds', 'bleeding', 'bled', 'haemorrhage', 'haemorrhage', 'hematoma', 'hematoma', 'haemorrhagic', 'hemorrhagic', and the positive control word 'coroner' (to identify cases which couldn't be read).

The code identified and downloaded 4305 PFDs, of which 4205 (98 %) were reports written by coroners and the remainder were mislabelled response letters. Two thousand and ten (48 %) of the documents were readable by the code and eligible for screening by at least one author (MH, FD) (Supplementary Appendix Fig. 1). The remaining pdfs were independently screened by two study authors (KS, CP, JJ, DL, HF, MH). Cases were included if thromboembolism was deemed to have caused or contributed to death. Included thromboembolic events included venous thromboemboli, and organ specific emboli such as pulmonary emboli. Cases which included both thromboembolism and haemorrhage were included, but cases of haemorrhage alone without thromboembolism were excluded. Cases where the deceased had a history of clots, but these did not contribute to the preventable death, were excluded. Cases involving emboli of other aetiology (e.g air or fat emboli) were excluded. Arterial thrombi, and other thrombotic diseases such as myocardial infarction and stroke, were excluded. Any ambiguities regarding case inclusion were discussed with and resolved by the senior investigator (FD).

2.3. Data extraction

Demographics, causes of death and morbidity, thromboprophylaxis issues as outlined in the Thrombosis UK GIRFT audit,[8] coroner concerns, and actions reported in responses from recipients were manually extracted from the PFD and response pdf documents by two authors (HF, MH) into a Microsoft Excel spreadsheet, and reviewed by FD. Of note, the year extracted is the year the PFD case was published on the Judiciary website, which is always later than the date of death itself due to the length of coroner inquests.

The number of deaths from VTE as recorded on death certificates was extracted for each year of the study from NHS England Digital.[2] The number of deaths from VTE in the original source tables are presented as the total occurring between the 1st April of a given year and the 31st March of the subsequent year. We therefore approximated the number of VTE-related deaths for each calendar year (1st January to 31st December of the same year) by combining 75 % of the value which contained April–December of the given year, and 25 % of the value which contained January–March.

2.4. Data analysis

The number of thromboembolism-related PFDs and their rates as a proportion of all PFDs and of all VTE-related deaths in England and Wales were calculated on a yearly basis. Medians and interquartile ranges (IQRs) were calculated for continuous variables (e.g. age) and frequencies were reported for categorical variables (e.g. sex, location of death, coroner area of jurisdiction). We calculated the years of life lost (YLL)[16] for each case (where age was reported) by extracting their remaining life expectancy from the Office for Nation Statistics (ONS) cohort life tables.[17]

Two investigators (MH, HF) assigned the International Statistical Classification of Disease and Related Health Problems 11th Revision (ICD-11)[18] codes for the causes of death to each PFD.

We calculated the raw number of thrombosis-related PFD reports, and the proportion of PFD reports which were thrombosis-related, written for each coroner jurisdiction and represented this on a choropleth map using the standard administrative regions of England and Wales.

We used directed content analysis[19] to collate and evaluate coroners' concerns to classify and identify recurrent themes. We pre-defined several possible themes based on clinical experience, existing literature and patient safety relevance, but if concerns failed to fit into these categories, we developed new themes as appropriate. This allowed us to highlight cases involving previously recognised concerns, and to explore novel concepts, drawing similarities and disparities from the data.

Responses from organisations or individuals to whom the PFDs were addressed were identified by manually accessing each publicly-accessible PFD case page on the Judiciary website, and downloading any response document present. These were collated, analysed, and summarised in a table. PFDs are occasionally copied to other recipients, but these organisations are not under a requirement to respond, and thus were not included in our analysis. Responses were classified as "early or on time" (on or before the due date), "late" (dated after the 56-day legal requirement[11]), or "no reply located" (response was not available on the Judiciary website at the time of extraction). We collated actions taken by organisations who responded to the PFD to identify and classify repeated themes.

2.5. Software

Microsoft Excel was used to generate line graphs. Datawrapper was used to produce bar charts,

and choropleth maps. We used R (version 4.1.1) to create the openly available code to download and screen pdf documents.[15] All data and study materials are openly available on an open repository.[13]

2.6. Missing data

Coroners have a duty to produce PFD reports when the coroner believes that action should be taken to prevent future deaths, but this is not mandatory. Thus, the data is constrained by the working practices of coroners who may vary in their thresholds for writing a PFD report. We could therefore only analyse the available data as provided in the PFD reports, in the knowledge that this is likely to be an underestimate of preventable thromboembolism-related deaths nationally.

3. Results

3.1. Case characteristics

There were 112 thromboembolism-related PFDs (representing 112 deaths) published between 1 July 2013 and 16 November 2022 in England and Wales (2.7 % of all PFDs). After an initial rise after 2013, the rate of thromboembolism-related PFDs has remained broadly constant (median yearly rate 2.7 %) from 2014 to 2022 (Fig. 1, Supplementary Appendix Table 1). Eight of the thromboembolism-related PFDs also involved some form of haemorrhage (Supplementary Appendix Fig. 1). The rate of thromboembolism-related deaths in England recorded by NHS England Digital written into a PFD remained consistently less than 0.2 % (Supplementary Appendix Table 1).

The median age at death was 59 years (IQR 47-75, n = 78). This corresponded to an estimated median 25 years of YLL per death (IQR 13-36 years), a total of 2041 estimated YLL. Most (52 %) thromboembolism deaths reported by coroners occurred in females.

The most common setting of the thromboembolism event was in the hospital (43.8 % of cases, n = 49) followed by the deceased's own home (21.4 %, n = 24), in care home/supported living (8.9 %, n = 10) and other community setting (8.9 %, n = 10, Supplementary Appendix Table 2). In 17 % of cases (n = 19) the report did not specify a clear location where thromboembolism occurred.

The 112 thromboembolism-related PFDs were written across the majority of coronial areas (Fig. 2, Supplementary Appendix Table 3). Coroners in Northwest England wrote the most (25 %, n = 28) thromboembolism-related PFDs (Fig. 2A–Supplementary Appendix Table 4), followed by South-East England (19 %, n = 21). However, the highest number of thromboembolism-related PFDs as a proportion of all the PFDs from that region were published by coroners in Wales (4.3 %), followed by the West Midlands (3.8 %) and South-East England (3.8 %) (Fig. 2B–Supplementary Appendix Table 4).

3.2. Causes of death and morbidity

On the judiciary website, the most frequently assigned category was 'Hospital-related deaths' (74.1 %, n = 83), followed by 'Community health care and Emergency Services related deaths' (13.4 %, n = 15), and Mental health related deaths (9.8 %, n = 11) (Supplementary Appendix Table 5).

The top three ICD-11 coded causes of death due to thromboembolism were pulmonary embolism (PE, 85.7 % of cases, n = 96), deep vein thrombosis (DVT, 61.6 %, n = 69), and immobility (11.6 %, n = 13) (Supplementary Appendix Table 6).

The most common type of thromboembolism reported was PE (93.8 % of cases, n = 105), followed by DVT (5.3 %, n = 6) (Supplementary Appendix Table 7). Notably, many of the PE cases arose from a prior DVT, and this was often mentioned as cause of death 1b, to 1a being PE. The types of thromboembolism reported in the PFDs by coroners differs from their reported frequency as causes of death, due to several PFDs not recording a clear cause of death, but still reporting relevant thromboembolic events related to preventable death.

3.3. Issues with thromboprophylaxis raised in PDFs

The Thrombosis UK GIRFT audit outlines several categories of issues which can arise with the prescription of thromboprophylaxis (i.e the

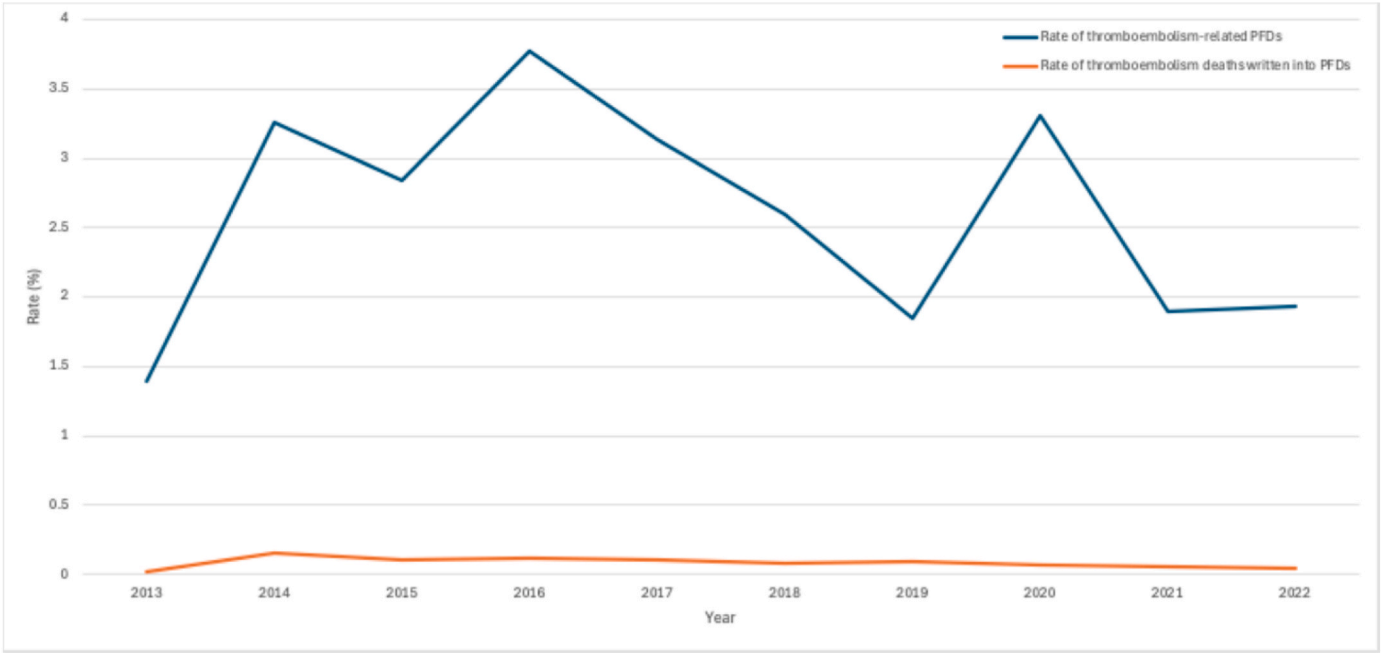

Fig. 1. The rate of thromboembolism-related Prevention of Future Deaths reports (PFDs) as a percentage of PFDs published yearly between 1 July 2013 and 16 November 2022 in England and Wales, and the rate of thromboembolism-related deaths (as per NHS Digital records in England) written into a PFD each year.

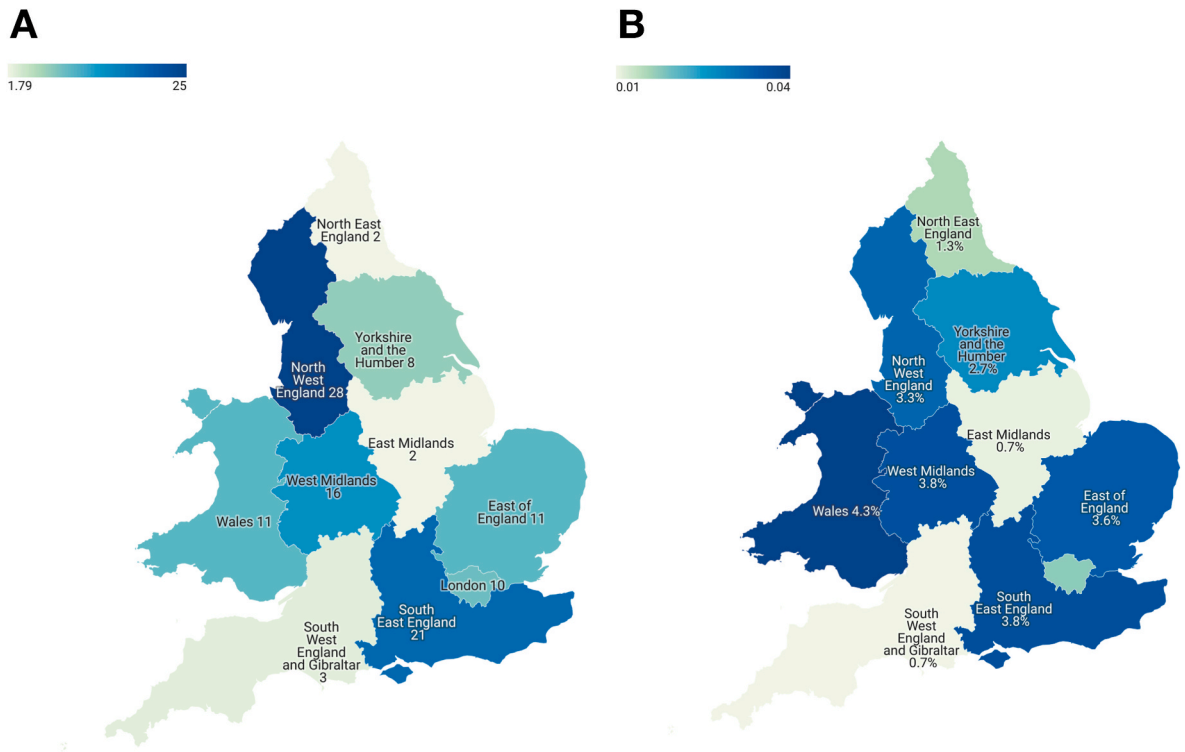

Fig. 2. A) Raw number of thromboembolism-related PFDs published per administrative region of England and Wales, 2013-2022. B) Number of thromboembolism-related PFDs published per region expressed as a percentage of all PFDs published by that region in the same time period.

prescription of anticoagulant medications or mechanical methods of reducing clotting risk in susceptible individuals in hospitals). One-third (34.8 %, n = 39) of the 112 thromboembolism PFDs did not report the issues described in the Thrombosis UK GIRFT audit (Supplementary Appendix Table 8). However, 120 similar issues were raised, most frequently surrounding lack of VTE risk assessments (27.7 %, n = 31), followed by lack of post-discharge thromboprophylaxis prescribing (15.2 %, n = 17), and lack of or incorrect reassessment (15.2 %, n = 17).

3.4. Coroners' concerns

Coroners reported 305 individual concerns across the 112 PFDs (Fig. 3, Supplementary Appendix Table 9). Of the relevant concerns, the most common themes of concern were failures in providing adequate care, including failures in communication (including with patients) or handovers (15.7 %, n = 48), following relevant protocols and guidelines (11.8 %, n = 36), and thromboembolism risk assessments (10.8 %, n = 33). Examples of specific concerns raised by coroners are illustrated in Table 1.

3.5. Responses from organisations to thromboembolism-related PFDs

Coroners sent 161 individual copies of the 112 PFDs to organisations and individuals, amounting to 142 unique recipients (Table 2). Of the 161 PFDs sent, 39 % (n = 63) received a response on time (Table 2), 17 % (n = 27) received a late response, and 44 % (n = 71) had not received a response at the time of data extraction.

In response letters to PFDs, the majority (76 %) reported initiating new changes to address these concerns (Supplementary Appendix Table 10). In 16 cases, responses stated that pre-existing systems or solutions were adequate. In only 6 PFDs did the response not acknowledge or agree with concerns.

When organisations initiated changes in response to PFDs, these most frequently involved improvements to training/re-education (n = 36, 27.1 %) or improvement/implementation of new protocols, pathways or guidance documents (n = 32, 24.1 %) (Supplementary Appendix Table 11).

4. Discussion

4.1. Summary of results

There were 112 thromboembolism-related deaths published between July 2013 and November 2022, where coroners believed action should be taken to prevent future deaths. On average, an estimated 25 years of life were lost per person. These cases predominantly occurred in the hospital setting, and the majority consisted of pulmonary emboli which were often precipitated by existing deep vein thrombosis or prolonged immobility. Numerous cases reported issues with thromboprophylaxis prescription or risk assessment.

Coroners frequently raised concerns related to failures in providing adequate care (including investigations and observations), assessing risk factors, or communicating safely and appropriately. Just under half of organisations who were sent a PFD about a preventable thromboembolism-related death did not respond. When organisations did respond, most acknowledged the concerns raised, and initiated changes involving improvements to guidelines and protocols, or regarding re-education and training.

4.2. Comparison with existing literature

While previous studies have used PFDs to investigate preventable deaths related to other patient safety issues such as falls,[20] sepsis,[21] and those involving medications,[22,23] this is the first study to focus solely on thromboembolism-related deaths. Several of the common concern themes raised by coroners, including failures in following guidelines, communication, and adequate risk assessment are shared across these different patient safety events, as are the poor response rates from organisations.[24]

The median age of death in our study was 59.5 years, and in around

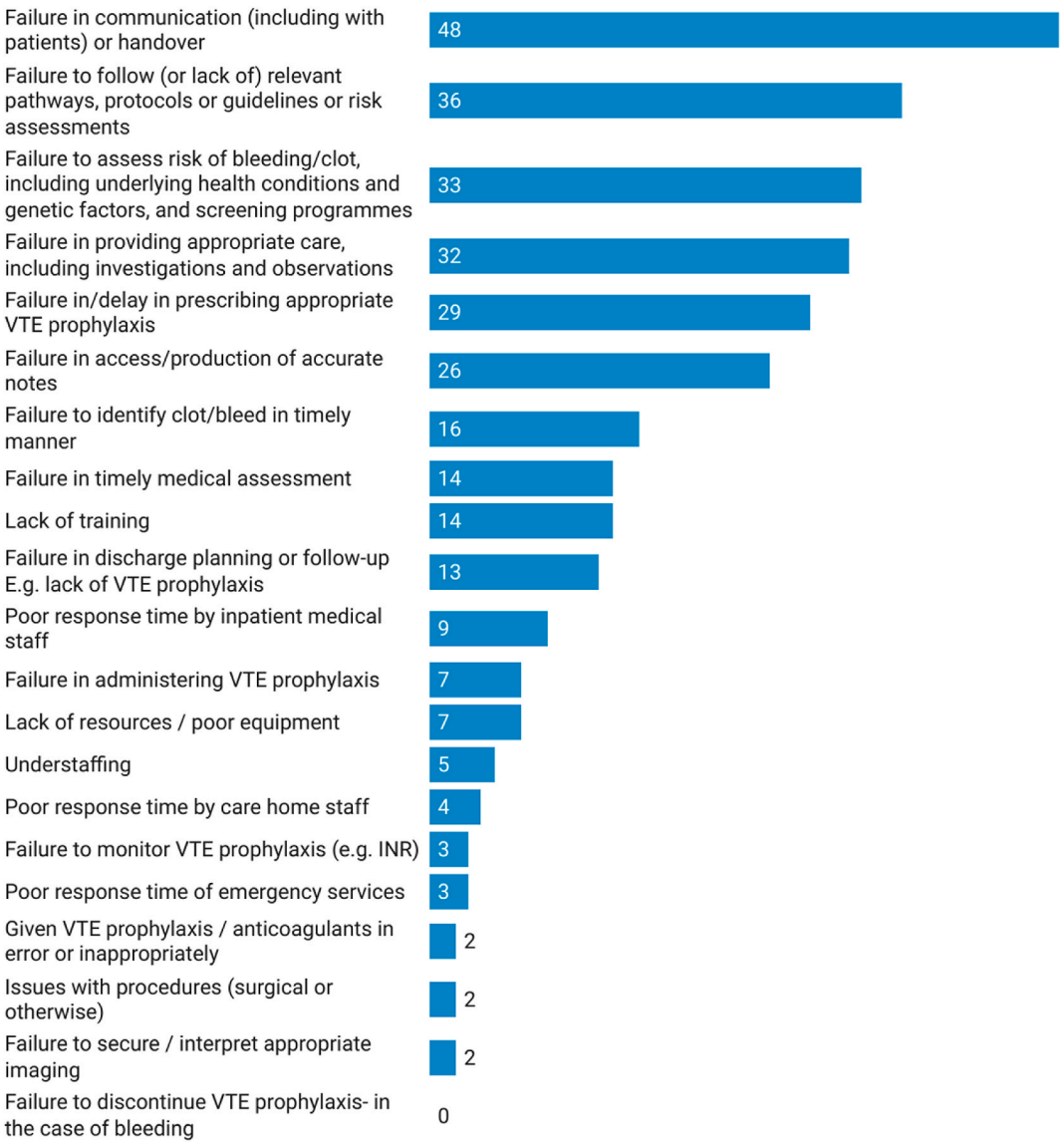

Fig. 3. Concerns raised by coroners in thromboembolism-related Prevention of Future Deaths reports (PFDs) published in England and Wales between July 2013 and November 2022 (presented as number of concerns raised in each category).

half of cases the thromboembolism was hospital-acquired. Our cohort was younger compared to a previous analysis of deaths related to hospital-acquired thrombosis, where the majority of deceased were aged over 70 years.[25] This may reflect a real increased preventable error rate in younger patients, perhaps because there is a lower suspicion of thrombosis in this age group. However, this may also represent a reporting bias among coroners, where PFDs are issued at a higher rate in response to younger cases compared to older adults with preventable thrombosis.

Following a 2005 report by the House of Commons Health Committee which highlighted the issue of preventable hospital-acquired thrombosis (HAT),[26] NICE published guidelines on VTE prevention in 2010, followed by an update in 2018.[27] The 2010 guidelines introduced compulsory national VTE risk assessment for inpatients, which led to a decrease in VTE-related mortality and readmissions,[28] and a 20 % drop in deaths from VTE-related events within 90 days from discharge, a key NHS performance indicator.[2] Despite these historic improvements, our study using data from PFDs suggest that sub-standard care continues to contribute to preventable thromboembolism-related deaths in hospitals. For example, forty-eight PFDs explicitly reported issues with VTE risk assessment, and data from NHS Digital from late 2019 shows that around 29 % of NHS hospitals failed to meet the quality target of 95 % of patients being risk-assessed for VTE.[29]

Many of the established risk factors for thrombosis among hospital inpatients, such as prolonged immobility, may also be present in care home residents, although assessing thrombosis risk in this setting is less well understood and acknowledged.[30,31] We found just under 1 in 10 of thromboembolism-related preventable deaths occurred in care homes. In a prospective cohort study of care home residents in the UK, the incidence of VTE was found to be substantially higher than in people in the community,[9] suggesting a need to better understand the risks of clots in this population, and develop and assess targeted interventions in care homes where appropriate.

The underlying number of thromboembolism-related deaths increased between 2019 and 2020 (Supplementary Appendix Table 1), with an increased rate of thromboembolism-related PFD reports in 2020. This may be related to the COVID pandemic, the first wave of which occurred in 2020 in the United Kingdom, and has been associated with an increased risk of thrombosis.[32]

Table 1
Selected examples of concerns raised by coroners in Prevention of Future Deaths reports (PFDs) involving thromboembolism published in England and Wales between July 2013 and November 2022, in the three most common themes identified using directed content analysis.

Theme	Case number	Example Concerns
Failure in providing appropriate care, including investigations and observations (16 %)	2017–0280	A patient with breathlessness and unilateral calf swelling was found to have an abnormal ECG, positive D dimer test and abnormal blood gases. The coroner reported that the Consultant in charge of unit did not make any entries in any of the notes and did not record that he had examined the deceased. The patient was discharged by a nurse practitioner who had no involvement in the patient's care. The appropriate treatment, heparin, was not commenced even though a DVT/PE was a differential diagnosis.
Failure to assess risk of clot, including underlying health conditions and genetic factors, and screening programmes (12 %)	2015–0095	There was no evidence the patient had been handed leaflets regarding the day-case varicose vein procedure and its risks, and a risk assessment form for thromboprophylaxis was not completed. Despite reduced mobility and leaving hospital in a wheelchair, the patient was deemed appropriate for nurse led discharge, although was not being seen by a nurse prior to leaving hospital. Had the risk assessment form been completed, risk factors would have been flagged up and prophylaxis could have been commenced.
Failure in communication (including with patients) or handover (12 %)	2021–0286	Communication through documentation and handover between hospitals regarding VTE assessment was unclear and led to a delay in prophylactic anticoagulation. Had the patient been re-assessed by the receiving hospital, the preventable death from PE could still have been avoided.

4.3. Strengths and limitations

This study adds to previous research undertaken to analyse subgroups of PFDs,[33] with specific reference to thromboembolism-related deaths. We used reproducible data collection methods to extract and analyse information from 112 thromboembolism-related PFDs from both inpatient and community settings. Despite forming a small proportion of total thromboembolism-related deaths in England and Wales, PFDs provide insights into processes and preventable failings in care which are not well-represented in other publicly available data sources.

There are important limitations in using information from PFDs. Coroners have a duty to produce PFD reports when the coroner believes that action should be taken to prevent future deaths, but this is not mandatory. Thus, the data is constrained by the working practices of coroners who may vary in their thresholds for writing a PFD report. We could therefore only analyse the available data as provided in the PFD reports, in the knowledge that this is likely to be an underestimate of preventable thromboembolism-related deaths nationally. Furthermore, inter-regional and inter-coroner variability on PFD publishing exists, highlighted in the relative subjectivity of coroner practices and their documented concerns.[24]

Furthermore, PFDs reporting of basic demographic data including ethnicity, gender, age, and the date of death is inconsistent and a proportion of this information was undocumented. Classification of PFDs as 'thromboembolism-related' may be complicated by other factors contributing to death but which were thromboembolism-independent. Our use of the YLL measure is a useful method to estimate the impact of early preventable deaths, however an important caveat is the underlying assumption that VTE-related deaths occur in people of average health and life expectancy, which may not be the case in all individuals, given several conditions which carry a lower life expectancy (such as cancer or inflammatory conditions) also increase the risk of venous thromboembolism. Where organisations had responded to coroners' concerns, we could only analyse those which were uploaded to the judiciary website. It is also impossible to ascertain whether the proposed organisational changes were implemented in practice, and the extent to which this has improved thromboembolism-related outcomes locally and nationally. Finally, we acknowledge that the study period ends in 2022, and therefore our analysis does not include PFDs published between then and the time of publication.

4.4. Implications for policy and practice

Despite improved standards and thrombosis outcomes in the last twenty years, our analysis of PFDs highlights an ongoing requirement for awareness and quality improvement at both the local and national level.

Current NICE guidance comprehensively sets out the guidance for reducing thrombosis risk, identifying DVT and PE, and the management of these when identified.[27,34] PFDs can be used locally to improve awareness of this gold standard guidance among hospital and community clinicians and the wider multidisciplinary team, as evidenced in several responses from organisations. The implementation of these risk assessment guidelines can be aided in practice through electronic alert systems, prompting timely risk assessment and requiring clinicians to

Table 2
Number of coroners' Prevention of Future Deaths reports (PFDs) involving thromboembolism published in England and Wales between July 2013 and November 2022 sent to each organisation type, and classification of response times using the Coroners (Investigations) Regulations 2013 statutory requirement of a response within 56 days.

Organisation Type	Total PFDs Sent (% of total)	On time responses	Late responses	No reply located
NHS Trusts	74	46.0 %	38	11
Government Bodies/ Departments	21	13.0 %	3	6
Professional Bodies	18	11.2 %	5	3
NHS England	9	5.6 %	2	4
NHS Health Boards (Wales)	9	5.6 %	3	0
NHS GPs	8	5.0 %	3	1
NHS CCG	6	3.7 %	4	0
Care/Nursing Homes	5	3.1 %	2	0
Other	4	2.5 %	1	0
NHS Ambulance Services	2	1.2 %	2	0
Care Providers	2	1.2 %	0	2
NHS Community Health Organisations	1	0.6 %	0	0
NHS Trusts	74	46.0 %	38	11
Total	**161**	**63 (39.1 %)**	**27 (16.8 %)**	**71 (44.1 %)**

prescribe adequate thromboprophylaxis.[35]

Ongoing local and national audits of VTE risk assessments and thromboprophylaxis prescriptions, as well as serious incident reviews of thrombosis events, will help ensure that national targets are being met and thus avoid potentially preventable thrombosis events. The mandatory reporting of VTE risk assessment rates to NHS England was suspended at the start of the COVID-19 pandemic in March 2020 and has only just restarted in 2024, with risk assessment rates lower now than pre-pandemic.[36]

Patient safety issues in care homes, including those related to medications such as anticoagulation continuation upon discharge from hospitals, have been highlighted by the NHS Patient Safety Strategy as a strategic research need.[12,37] Further research is needed into the burden of potentially preventable thrombosis in this population, as well as the balancing of risks and benefits of anticoagulation in a population which is older with higher rates of multimorbidity compared to the general population.

4.5. Conclusions

PFD reports can provide valuable insights into the failures in care which lead to preventable deaths relating to thromboembolism. Wider dissemination of PFD findings, especially through targeted systematic case series and thematic reviews such as the present study, would help to highlight and emphasise important current standards of care. These include the timely diagnosis of VTE, prompt treatment when identified, and routine risk assessment and thromboprophylaxis. In doing so, PFDs have the potential to improve patient safety locally and nationally. Routine monitoring of PFDs should be recommended across NHS Trusts to facilitate learning from preventable deaths and avoid similar deaths in the future.

Author statements

Ethical approval

This study uses publicly available information, for which ethics committee approval is not required. Both the General Data Protection Regulation (GDPR) and the Data Protection Act (2018) no longer apply to identifiable data that relate to a person once they have died.

Funding

No funding was obtained or received to undertake this study.

Competing interests

MH and HSF declare no interests. FD, CP, KS, JJ, and DL work as doctors in the National Health Service (NHS). GCR is employed by King's College London as a King's Prize Research Fellow through the Anthony and Elizabeth Mellows Charitable Settlement. GCR is the Director of Richello Limited, providing consultancy across private, charitable and public sectors, and is the Director of Preventable Deaths Tracker. GCR has been reimbursed for travel expenses to speak at conferences and events, and received speaker fees for training and presenting at coronial law and inquest events. GCR receives fees from subscriptions to a personal Substack publication.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.puhe.2025.105928.

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