

# What do Prevention of Future Death Reports tell us about maternity care in UK hospitals?

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## PREVENTION OF FUTURE DEATH (PFD) REPORTS

**Introduction:** Despite UK government goals to reduce maternal deaths by 50% by 2025, maternal mortality rates increased by 3% between 2010-2012 and 2018-2020 (excluding COVID-19 deaths).

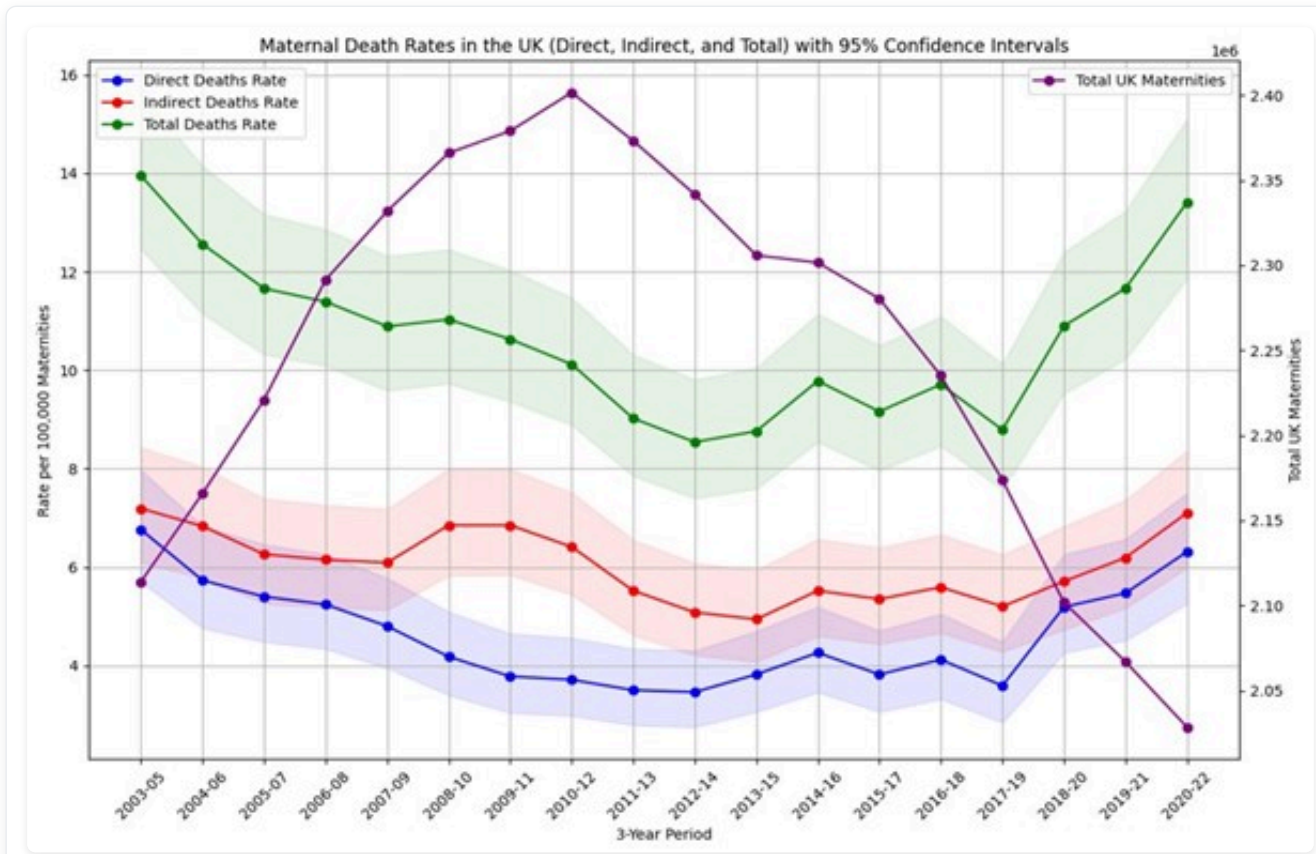


Figure 1: Maternal Mortality Trends

**What are PFD Reports?** Independent judicial assessments issued by coroners following inquests into unexpected deaths, providing cross-organisational perspectives on patient safety issues.

**Research Question:** What do Prevention of Future Death reports reveal about the key safety themes and system-level failures in UK maternity care, and how can automated multi-framework analysis enhance patient safety intelligence?

## DATA

51 PFD Reports | UK Judiciary Data | 2014-2025 Study Period

**Data Collection Method:** Specialised web scraping tool extracted PFD reports from UK Judiciary website using maternal healthcare search terms including: midwifery, birth, baby, maternal, infant, obstetrics, neonatal, perinatal, pregnancy, postnatal, antenatal, maternity, stillbirth, antepartum, foetal/foetal.

**Data:** Publicly accessible coroners' reports from UK Judiciary website  
**Ethics:** No ethical approval required for public data analysis

## FRAMEWORK DEVELOPMENT

### Three Complementary Frameworks:

**1. Safety Intelligence Research framework (SIRch):** Sociotechnical categories based on SEIPS model - person factors (staff performance, decision errors), job/task factors (care planning, monitoring), organisation factors (team culture, communication), technologies & tools (equipment issues), environment factors (physical layout, external pressures).

**2. Black maternal health framework:** Equity dimensions from House of Commons Women & Equalities Committee report - communication (dismissed concerns), fragmented care (poorly coordinating providers), informed consent/agency (informed decisions), dignity/respect (discrimination faced), care quality issues (microaggressions, racism), socioeconomic factors and deprivation.

**3. Extended safety framework:** Emerging themes from textual analysis - medication safety, diagnostic testing & specimen handling, time-critical interventions, human factors & cognitive aspects, service design & patient flow, emergency preparedness, staff wellbeing & burnout, electronic health record issues.

**Triangulation approach:** Simultaneous analysis across three frameworks enables comprehensive coverage whilst revealing framework-specific blind spots in safety investigation and maintaining analytical rigour.

## PFD VS HSIB COMPARISON

PFD reports (n=51)		HSIB reports (n=188)	
Medication Safety (*)	78.4%	Communication Factor	84.6%
Staff Performance (+)	78.4%	Teamworking	82.4%
Team Culture (+)	74.5%	Assessment Investigation	79.8%
Informed consent/agency (-)	66.7%	Patient physical characteristics	62.8%
Diagnostic Testing & Specimens (*)	64.7%	Staff-Slip or Lapse	52.7%
Patient Record Attendance (+)	62.7%	Escalation/Referral Factor	51.6%
Physical Layout & Environment (+)	56.9%	National & Local Guidance	48.9%
Staff Decision Error (+)	41.2%	Technologies & Tools-Interpretation	47.9%
Peer Support & Supervision (*)	39.2%	Obstetric Review	47.3%
External Societal Factor (+)	39.2%	Staff Decision Error	47.3%

**House of Commons Women & Equalities Committee themes in PFD reports:** informed consent/agency ranked 4th (66.7%), followed by guidance gaps (37.3%), care quality issues (31.4%), and communication (29.4%).

## RESEARCH RESULTS & ANALYSIS

### UK Judiciary PFD Reports Analysis

This application analyses Prevention of Future Deaths (PFD) reports from the UK Judiciary website to uncover patterns, themes, and insights.

How to Use This Tool

#### Complete Analysis Pipeline:

1. **Scrape Reports:** Start by collecting PFD reports from the UK Judiciary website
2. **Scraped File Preparation:** Process and merge your scraped reports
3. **Scraped File Analysis:** Visualise and analyse basic report patterns
4. **Topic Analysis & Summaries:** Generate basic themes from report content
5. **Concept Annotation:** Conduct advanced theme analysis with AI
6. **Theme Analysis Dashboard:** Explore comprehensive theme visualisations

Select each numbered tab in sequence to move through the complete analysis pipeline.

Figure 3: Dashboard

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Search tool for Prevention of Future Deaths (PFD) reports from the UK Judiciary website.

- Filtering by keywords, categories, and date range
- Export options in CSV and Excel formats

Handling Large Result Sets: For extensive search results, use the 'Start page' and 'End page' number inputs to download reports in manageable batches.

#### Scrape PFD Reports

Search keywords:

Sort by: **Relevance**

Published on or after:

Published on or before:

Start page:

End page (Default: 10 pages per extraction):

Page per batch (Ideally set to 5):

Search Reports

Stop Scraping

Figure 4: Tool Screenshots

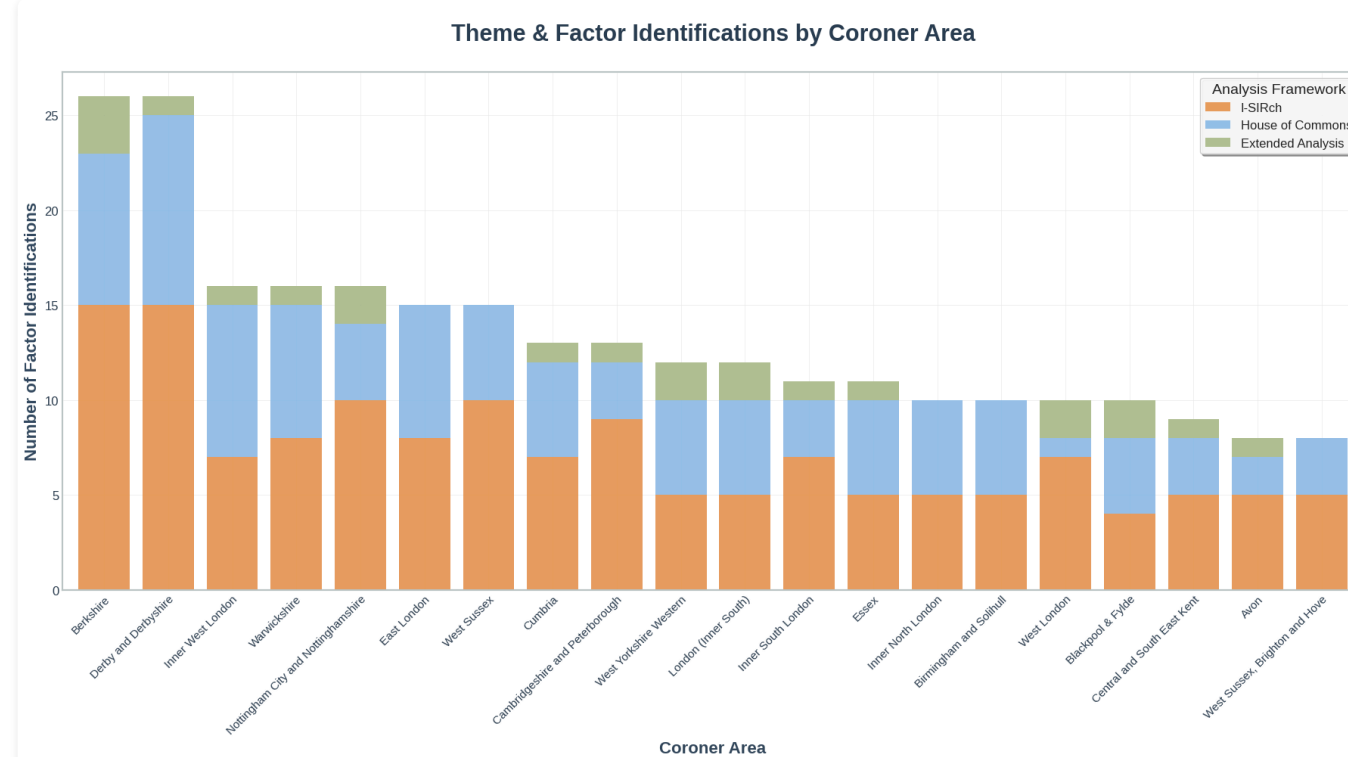


Figure 5: Regional Distribution

## TECHNICAL ARCHITECTURE

### Enhanced ML Pipeline with Implementation Details

1 **Automated Web Scraping**

BeautifulSoup4 + rate-limited batch processing with PDF extraction & regex-based metadata parsing

2 **Advanced Data Preparation**

Multi-file merging, record-level deduplication, temporal extraction, missing value imputation & content validation

3 **Exploratory Analysis**

Interactive dashboards with data quality validation, distribution analysis & cluster evaluation

4 **Multi-Framework Concept Annotation**

Bio\_ClinicalBERT-based semantic analysis with 768D contextual embeddings, generating thematic annotations across three frameworks simultaneously

5 **Advanced Scoring & Theme Identification**

Dual-component scoring system (70% semantic similarity + 30% keyword density) with contextual window analysis & confidence thresholds (High  $\geq 0.8$ , Medium 0.65-0.8, Low  $< 0.65$ )

6 **Advanced Analytics Dashboard**

Interactive Plotly dashboards analysing PFD reports by year, coroner area, framework distribution, theme co-occurrence networks, correlation matrices with multi-format export

## CONCLUSIONS & IMPACT

**Clinical implications:** PFD reports identify system-level failures not apparent through individual healthcare provider investigations, providing unique insights that complement existing incident reporting systems.

**Research impact:** This first systematic analysis of maternity-related PFD reports establishes a novel data source for patient safety intelligence. The findings reveal priority areas spanning clinical practice, organisational culture, and patient rights, providing evidence for comprehensive safety improvement initiatives across UK maternity care systems.

**Future directions:** Development of a unified framework applicable across healthcare specialities including maternity, mental health, and other clinical domains to enable cross-speciality learning and comparative safety analysis.

**Study Limitations:** Ethnicity data was not available as PFD reports focus on systemic issues rather than demographic characteristics.

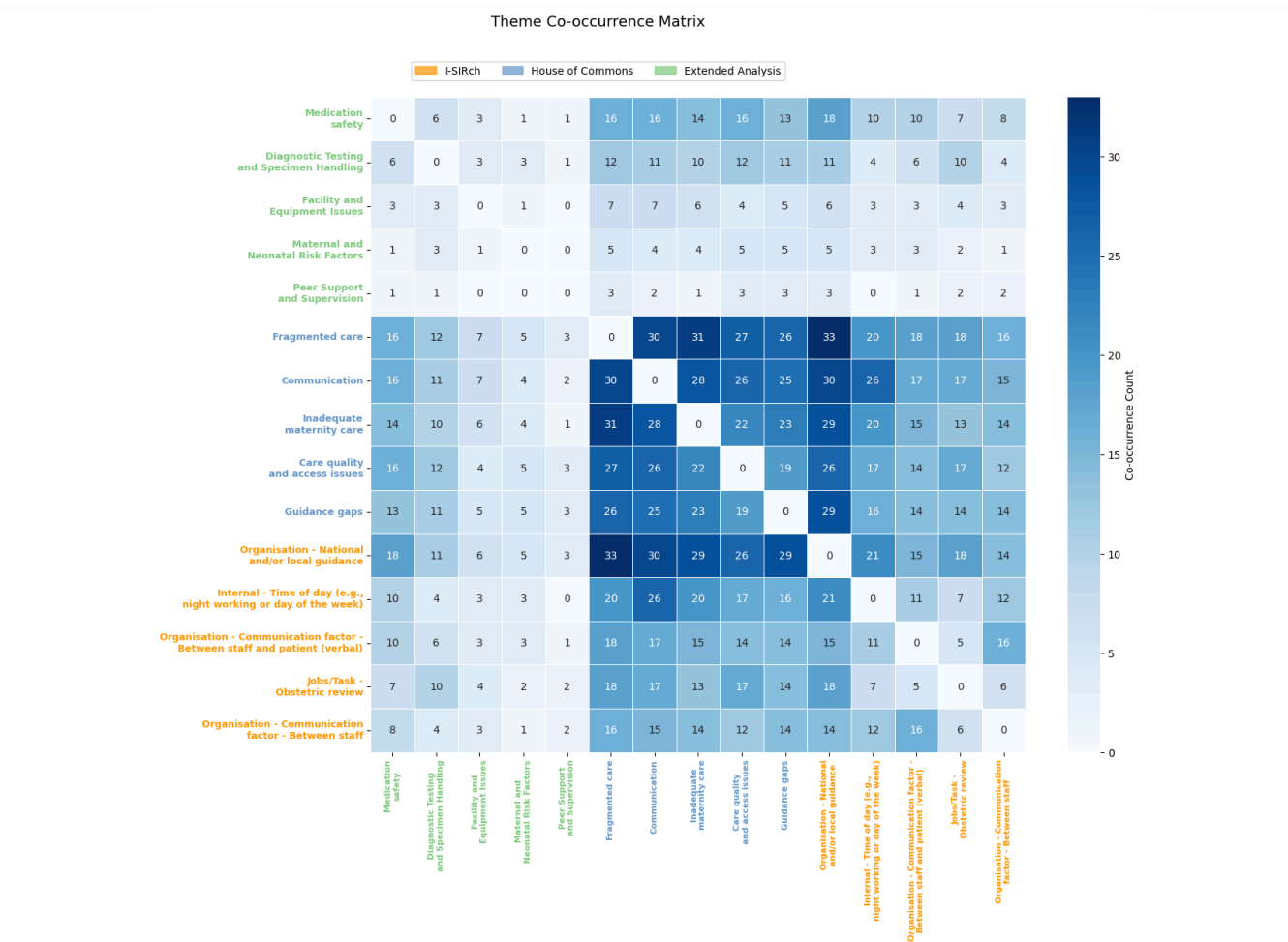


Figure 6: Top 15 Theme Co-occurrence Network

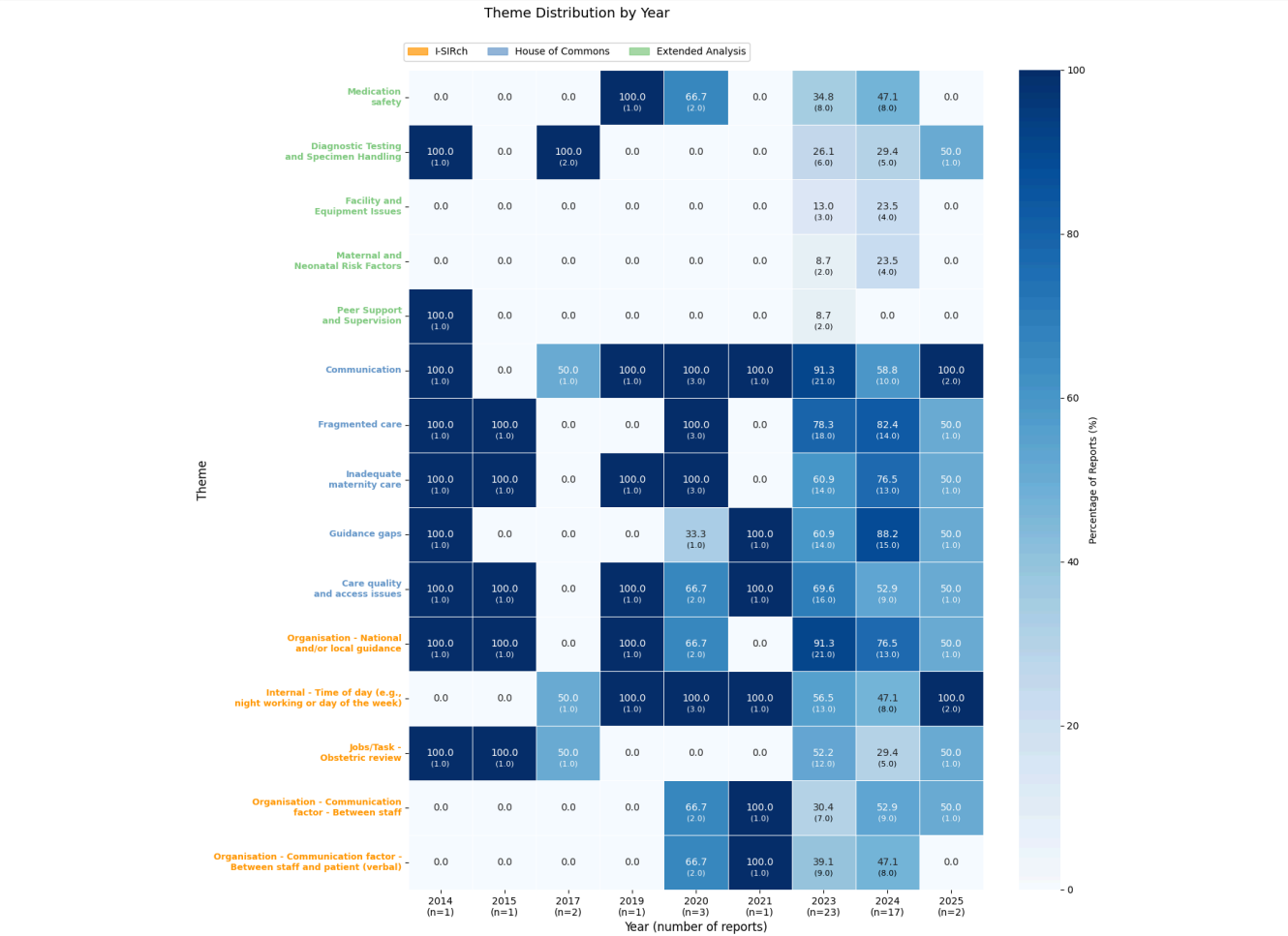


Figure 7: Top 15 Theme Distribution by Year

## REFERENCES

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