Individual and system-level contributors to maternal mortality: A systematic review of maternity safety reports in the UK

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Background: The UK has the second-highest maternal mortality rate among the eight european countries with enhanced surveillance systems.1 Recent statistics indicate that maternal mortality rates in the UK have risen to levels not seen since 2003–2005.2 Despite recommendations from confidential enquiries into maternal deaths, there have been no major improvements in outcomes. The contribution of identified contributory factors to overall maternal deaths, and whether these vary by maternal condition and other factors, remains unclear.

Objectives: To thematically map factors contributing to maternal deaths as identified in UK maternal death enquiry reports, stratified by condition and timing in pregnancy to identify priority areas to improve maternal poor outcomes.

Methods: We searched MEDLINE, EMBASE, and Google Scholar for UK national and regional maternity safety audits and confidential enquiry reports into maternal deaths occurring during pregnancy and up to one year postpartum, published between January 2010 and January 2025. Grey literature was included. Two independent reviewers screened reports using predefined eligibility criteria. Contributing factors were categorised using an adapted Ishikawa (fishbone) framework with six main categories: human factors, processes, equipment/technology, policies/procedures, environment, and system-level issues, with further subcategorisation. Sankey diagrams were used to visualise findings and quantify the proportion of contributing factors for each maternal condition category (pregnancy-related, labour and birth-related, and medical conditions). Temporal trends were also analysed.

Results: Human factors (38.5%), processes (29.0%), system-level issues (12.3%), and policies and procedures (10.9%) were the most frequently cited contributors to maternal deaths. Within the human factors category, lack of training and experience (79.8%) and poor communication (16.1%) were predominant. Additional contributing factors included deficits in antenatal and intrapartum care and poor adherence to clinical guidelines were also identified.

Conclusion: Addressing systemic and structural challenges is crucial for improving maternal care and reducing mortality. Equally, understanding the difficulties faced by healthcare professionals is vital to improving care delivery. The themes identified in this review should inform future priorities for maternity service improvement in the UK.

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NIHR SafetyNet Symposium 2025
psrc-network.nihr.ac.uk

Abstract

Background:

The UK has the second-highest maternal mortality rate among the eight European countries with enhanced surveillance systems. Recent statistics indicate that maternal mortality rates in the UK have risen to levels not seen since 2003–2005. Despite recommendations from confidential enquiries into maternal deaths, there have been no major improvements in outcomes. The contribution of identified contributory factors to overall maternal deaths, and whether these vary by maternal condition and other factors remains unclear.

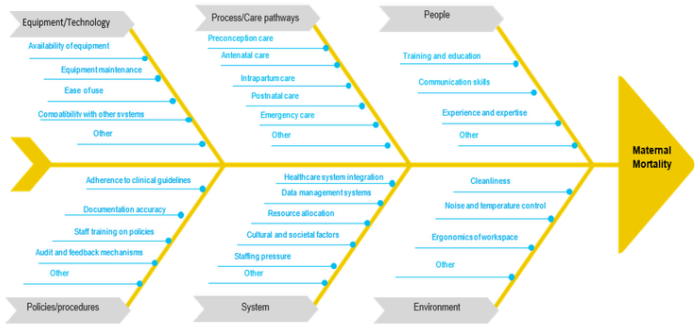
Objectives:

To thematically map factors contributing to maternal deaths as identified in UK maternal death enquiry reports, stratified by condition and timing in pregnancy to identify priority areas to improve poor maternal outcomes.

Methodology:

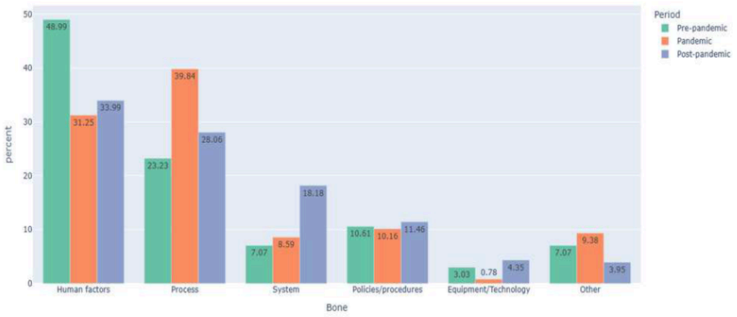
We searched MEDLINE, EMBASE, and Google Scholar for UK national and regional maternity safety audits and confidential enquiry reports into maternal deaths occurring during pregnancy and up to one year postpartum, published between January 2010 and January 2025. Grey literature was included. Two independent reviewers screened reports using predefined eligibility criteria. Contributing factors were categorised using an adapted Ishikawa (fishbone) framework with six main categories: human factors, process/care pathway, equipment/technology, policies/procedures, environment, and system-level issues, with further subcategorisation. Sankey diagrams were used to visualise findings and quantify the proportion of contributing factors for each maternal condition category (pregnancy-related, labour and birth-related, and medical conditions). Temporal trends were also analysed.

The Ishikawa (fishbone) Framework



Results:

1 **Changes in the attribution of care deficits by categories over the pandemic period**



Most frequently cited contributors to maternal deaths:
- ❖ Human factors – 38.5%
- ❖ Process/Care pathway – 29.0%
- ❖ System-level issues – 12.3%
- ❖ Policies and procedures – 10.9%

Within human factors:
- ❖ Lack of training and experience – 79.8%
- ❖ Poor communication – 16.1%

Additional contributing factors:
- ❖ Deficits in antenatal and intrapartum care
- ❖ Poor adherence to clinical guidelines

Conclusion:

Addressing systemic and structural challenges is crucial for improving maternal care and reducing mortality. Equally, understanding the difficulties faced by healthcare professionals is vital to improving care delivery. The themes identified in this review should inform future priorities for maternity service improvement in the UK

Implications for Clinical Practice:

- ❖Prioritise targeted training and skills development for maternity care providers to address gaps in knowledge and experience.
- ❖Implement structured communication protocols across the maternity care pathway to reduce errors and delays.
- ❖Strengthen adherence to evidence-based antenatal and intrapartum care guidelines through regular audits and feedback.

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This study is funded by the National Institute for Health and Care Research (NIHR) Midlands Patient Safety Research Collaboration. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.