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MORTALITY REVIEW BULLETIN December 2020

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[Perspectives on the death investigation during the COVID-19 pandemic](#)

Xue Y, et al.

Forensic Sci Int 2020;2:126-8

The pandemic of COVID-19 caused by 2019-nCoV outbreaks in most of the countries, has subsequently spread rapidly and become a pandemic worldwide. Due to the strong infectivity of COVID-19 and lack of experience of performing an autopsy in infectious disease-induced death, the pandemic created some challenges for forensic practitioners. In this article, we summarize the experience of how we handle the confirmed or suspected infectious cases and give some perspectives for the future.

[Improving the quality of mortality review equity reporting: Development of an indigenous Māori responsiveness rubric](#)

Wilson D, et al.

Int J Qual Health Care 2020;32(8):517-21

OBJECTIVE: To improve consistency in New Zealand's Mortality Review Committees' (MRCs) analysis, interpretation and recommendations, specifically related to equity and Māori (the Indigenous peoples of Aotearoa New Zealand) mortality. DESIGN: A qualitative Plan-Do-Check-Act design informed by Māori expertise to develop a rubric and guidelines. The rubric and guidelines aimed to improve MRCs'

capability to analyse mortality data, its interpretation and the recommendations for preventing deaths. SETTING: New Zealand's MRCs make recommendations to address preventable deaths. Variation existed between the MRCs' understanding of equity, and its application to reduce avoidable mortality for Māori, which subsequently influenced their analysis, reporting and the recommendations generated. Improving the quality and robustness of MRCs' recommendations and reporting are crucial for improving equity. PARTICIPANTS: Māori Caucus (comprising MRC members with Māori health and wellbeing expertise) designed the rubric and guidelines with input from the secretariat and other MRC Chairs and members. INTERVENTION(S): None. MAIN OUTCOME MEASURE(S): None. RESULTS: The rubric comprises four key 'pou' (metaphorical posts or domains) 'Tika' (doing things right); 'Manaakitanga' (caring compassionately); 'Mana' (status, authority); and 'Mahi tahi' (working collaboratively); and criteria for three levels of practice. Evaluation of the efficacy of the use of the rubric and its implementation showed further education and support was required. CONCLUSIONS: A shared understanding of equity about mortality is required. Effective implementation of a quality-based rubric into practice requires careful planning and ongoing education and support for staff and committee members at multiple levels. Follow-up support is needed to support its implementation into practice.

[Learning from deaths: A mortality review of emergency laparotomies at Cardiff and Vale University Health Board](#)

Williams N, et al.

Anaesthesia 2020;75 (Supplement 2):98

The National Emergency Laparotomy Audit (NELA) recommends that all deaths are to be examined in a structured manner. Using the principles of the 'National Mortality Case Record Review Programme' [1], we conducted a review of high-risk laparotomy deaths, to identify areas for quality-improvement interventions. Methods We reviewed 20 deaths in patients deemed as higher risk (PPOSSUM > 10%) between February 2017 and February 2018. We created a mortality review template, including compliance with NELA standards and a narrative focusing on specific phases. The reviews were completed by two senior anaesthetic registrars and assessed by the NELA surgical, anaesthetic and intensive care leads. Results Fig. 1 shows compliance of > 70% in all standards except elderly care input. The review narratives highlighted poor sepsis management, the need for more senior input into the management of frail patients and issues with the treatment and transfer of patients with acute abdomens admitted via medicine to our non-acute surgical site. Discussion This review, together with NELA recommendations, led to several interventions. The emergency laparotomy pathway has been revised to include a frailty score in pre-operative risk scoring. A sepsis tool [2] and further prompts for sepsis recognition have also been added as part of a project to improve our sepsis management. We have provided multidisciplinary teaching in frailty and sepsis recognition. An emergency laparotomy simulation session is planned for foundation trainees. We have reviewed further laparotomy patients admitted via medicine with the physicians. A multiple-specialty collaboration has developed rapid surgical referral pathways for high-risk emergency laparotomy patients from the medical admissions unit and emergency department. We have secured funding for a peri-operative elderly care physician. The reviews were instrumental in focusing our improvement activity. We have achieved wider organisational engagement with NELA and hope this will be reflected in improved outcomes. (Table Presented).

[Reducing hospital mortality: Incremental change informed by structured mortality review is effective](#)

Tiwari D, et al.

Future Healthc J 2020;7(2):143-8

Hospital mortality rates have frequently been improved by identifying diagnostic groups with high mortality and targeting interventions to those specific groups. We found that high residual inpatient mortality persisted after targeted measures had achieved an initial reduction, and that the causes were spread across a wide range of diagnostic groups. Further interventions were put in place consisting of a

structured electronic mortality form and systematised mortality scrutiny and reporting (primary intervention) accompanied by a number of quality improvement interventions arising from the mortality analysis (secondary interventions). We found that those interventions were associated with progressive improvements in mortality rates and average lengths of inpatient stay over the 5-year study period. Winter quarter mortality improvements reached a high level of statistical significance but could not be attributed to changes in any particular diagnostic groups. We conclude that progress with mortality improvements is probably best achieved by applying both code-targeted and general interventions simultaneously.

[Incorporating trend analysis into the intensive care individual mortality review process](#)

Titterton M, et al.

Critical Care Conference: 40th International Symposium on Intensive Care and Emergency Medicine Belgium 2020;24(Supplement 1)

Introduction: Robust clinical governance requires analysis of patient outcomes during an ICU admission [1]. On one adult ICU weekly mortality meetings are used for this purpose and aid multidisciplinary reflections on individual patient deaths. However, such reviews run the risk of being subjective and fail to acknowledge themes which may relate to preceding or subsequent deaths. This paper describes a new mortality review process in which: a) reviews are structured using the Structured Judgement Review (SJR) framework [2]; and b) themes are generated over an extended period of time to create longitudinal learning from death. Method(s): The SJR framework has been developed by NHS improvement for the new medical examiner role, looking at inpatient deaths. We adapted this to better suit the ICU creating a novel review structure. This involves explicit judgement comments being recorded, and the use of a scoring system to analyse the quality of care during the patient's stay with a focus on elements of care delivered on the ICU. Tabulation of this information allows analysis over time, identifying trends across all patients, and in specific subgroups. Result(s): This framework has been rolled out at the St George's Cardiothoracic ICU weekly mortality meetings. Themes that have emerged include parent team ownership, delayed palliative care referrals and inadequate documentation of mental capacity. This will continue as part of a three-month trial and following review of this trial may be extended to other critical care units in the trust. Conclusion(s): This system allows greater insight into patient deaths in a longitudinal fashion and facilitates local identification of problems at an early stage in a way that is not possible within the traditional mortality review format. The nature of the process means that key areas for change can be identified as a routine part of the clinical week.

[A regional approach for infection prevention in death investigations during the COVID-19 era](#)

Nakamura M, et al.

Leg Med (Tokyo) 2020;48:101829

Highlights: Postmortem procedures in the COVID-19 era require infection prevention. Postmortem PCR can be used to determine infection risk. Forensic medical examiners and clinicians proactively test cadavers for COVID-19. A fluent updating of examining system would be required.

[Introduction of postmortem CT increases the postmortem examination rate without negatively impacting the rate of traditional autopsy in daily practice: an implementation study](#)

Mentink MG, et al.

J Clin Pathol 2020

AIM: The aim of this implementation study was to assess the effect of postmortem CT (PMCT) and postmortem sampling (PMS) on (traditional) autopsy and postmortem examination rates. Additionally, the feasibility of PMCT and PMS in daily practice was assessed. METHODS: For a period of 23 months, PMCT and PMS were used as additional modalities to the autopsy at the Department of Internal Medicine. The next of kin provided consent for 123 postmortem examinations. Autopsy rates were derived from the Dutch Pathology Registry, and postmortem examination rates were calculated for the

period before, during and after the study period, and the exclusion rate, table time, time interval to informing the referring clinicians with results and the time interval to the Multidisciplinary Mortality Review Board (MMRB) meeting were objectified to assess the feasibility. RESULTS: The postmortem examination rate increased (from 18.8% to 32.5%, $p < 0.001$) without a decline in the autopsy rate. The autopsy rate did not change substantially after implementation (0.2% decrease). The exclusion rate was 2%, the table time was 23 min, and a median time interval of 4.1 hours between PMCT and discussing its results with the referring clinicians was observed. Additionally, more than 80% of the MMRB meetings were held within 8 weeks after the death of the patient. CONCLUSIONS: Our study shows that the implementation of a multidisciplinary postmortem examination is feasible in daily practice and does not adversely affect the autopsy rate, while increasing the postmortem examination rate.

[Reflections on implementing a hospital-wide provider-based electronic inpatient mortality review system: lessons learnt](#)

Mendu ML, et al.

BMJ Qual Saf 2020;29(4):304-12

IMPORTANCE: Death due to preventable medical error is a leading cause of death, with varying estimates of preventable death rates (14%-56% of total deaths based on national extrapolated estimates, 3%-11% based on single-centre estimates). Yet, how best to reduce preventable mortality in hospitals remains unknown. OBJECTIVE: In this article, we detail lessons learnt from implementing a hospital-wide, automated, real-time, electronic mortality reporting system that relies on the opinions of front-line clinicians to identify opportunities for improvement. We also summarise data obtained regarding possible preventability, systems issues identified and addressed, and challenges with implementation. We outline our process of survey, evaluation, escalation and tracking of opportunities identified through the review process. METHODS: We aggregated and analysed 7 years of review data regarding deaths, review responses categorised by ratings of possible preventability and inter-rater reliability of possible preventability. A qualitative analysis of reviews was performed to identify care delivery opportunities and institutional response. RESULTS: Over the course of 7 years, 7856 inpatient deaths occurred, and 91% had at least one review completed. 5.2% were rated by front-line clinicians as potentially being preventable (likely or possibly), and this rate was consistent over time. However, there was only slight inter-rater agreement regarding potential preventability (Cohen's kappa=0.185). Nevertheless, several major systems-level opportunities were identified that facilitated care delivery improvements, such as communication challenges, need for improved end-of-life care and interhospital transfer safety. CONCLUSIONS: Through implementation, we found that a hospital-wide mortality review process that elicits feedback from front-line providers is feasible, and provides valuable insights regarding potential preventable mortality and prioritising actionable opportunities for care delivery improvements.

[Systematic Preventable Trauma Death Rate Survey to Establish the Region-based Inclusive Trauma System in a Representative Province of Korea](#)

Kwon J, et al.

J Korean Med Sci 2020;35(50):e417

BACKGROUND: Trauma mortality review is the first step in assessing the quality of the trauma treatment system and provides an important basis for establishing a regional inclusive trauma system. This study aimed to obtain a reliable measure of the preventable trauma death rate in a single province in Korea. METHODS: From January to December 2017, a total of 500 sample cases of trauma-related deaths from 64 hospitals in Gyeonggi Province were included. All cases were evaluated for preventability and opportunities for improvement using a multidisciplinary panel review approach. RESULTS: Overall, 337 cases were included in the calculation for the preventable trauma death rate. The preventable trauma death rate was estimated at 17.0%. The odds ratio was 3.97 folds higher for those who arrived within "1-3 hours" than those who arrived within "1 hour." When the final treatment institution was not a regional trauma center, the odds ratio was 2.39 folds higher than that of a regional

trauma center. The most significant stage of preventable trauma death was the hospital stage, during which 86.7% of the cases occurred, of which only 10.3% occurred in the regional trauma center, whereas preventable trauma death was more of a problem at emergency medical institutions.

CONCLUSION: The preventable trauma death rate was slightly lower in this study than in previous studies, although several problems were noted during inter-hospital transfer; in the hospital stage, more problems were noted at emergency medical care facilities than at regional trauma centers. Further, several opportunities for improvements were discovered regarding bleeding control.

[Physician-Led Systematic Mortality Reviews Identify Goals of Care Discussions as the Major Opportunity to Reduce Hospital Mortality in 2 Major Academic Medical Centers](#)

Khan S, et al.

Journal of the American College of Surgeons 2020;231 (4 Supplement 1):S145

Introduction: Mortality reviews improve quality of care at hospitals and identify factors leading to preventable deaths. Two academic quaternary referral hospitals within our health system implemented a systematic mortality review process to identify the common factors contributing to mortality and end-of-life care decision making. **Method(s):** A physician-led Q&S committee was created July 2018 with representatives from all inpatient clinical specialties to improve the quality of end-of-life care reduce. Specialty-specific physician leaders completed an electronic questionnaire for each mortality with identification and classification of opportunities for mortality prevention and better end-of-life care. These opportunities were presented to the Q&S committee bimonthly and to departmental, risk management, and/or administrative committees. **Result(s):** In all, 95% (n = 1,170) of mortalities between December 2018 and October 2019 were reviewed; 50% of the mortalities were observed in patients transferred from outside hospitals. Identified opportunities for improvement in end-of-life care included earlier goals of care (GOC) discussions (37.5%), earlier palliative care consultations (17.2%), and better communication between care teams and families (14.2%). For those with earlier GOC opportunities, 66.7% had an opportunity before admission and 33.3% should have had earlier GOC conversations per the physician reviewing the mortality during the hospitalization. Mean days to documentation of GOC was 3 days. **Conclusion(s):** Implementation of a hospital-wide systematic mortality review process in the setting of a physician-led Q&S committee was feasible and enhanced understanding of factors contributing to mortality. Earlier GOC discussions before and earlier in the hospitalization are opportunities to improve the quality of care. Copyright © 2020

[Clinical Mortality Review in a Large COVID-19 Cohort](#)

Jarrett MP, et al.

medRxiv 2020

BACKGROUND: Northwell Health (Northwell), an integrated health system in New York, treated more than 15000 inpatients with coronavirus disease (COVID-19) at the US epicenter of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. We describe the demographic characteristics of COVID-19 mortalities, observation of frequent rapid response teams (RRT)/cardiac arrest (CA) calls for non-intensive care unit (ICU) patients, and factors that contributed to RRT/CA calls. **METHODS:** A team of registered nurses reviewed medical records of inpatients who tested positive for SARS-CoV-2 via polymerase chain reaction (PCR) before or on admission and died between March 13 (first Northwell inpatient expiration) and April 30, 2020 at 15 Northwell hospitals. Findings for these patients were abstracted into a database and statistically analyzed. **FINDINGS:** Of 2634 COVID-19 mortalities, 56.1% had oxygen saturation levels greater than or equal to 90% on presentation and required no respiratory support. At least one RRT/CA was called on 42.2% of patients at a non-ICU level of care. Before the RRT/CA call, the most recent oxygen saturation levels for 76.6% of non-ICU patients were at least 90%. At the time RRT/CA was called, 43.1% had an oxygen saturation less than 80%. **INTERPRETATION:** This study represents one of the largest cohorts of reviewed mortalities that also captures data in non-structured fields. Approximately 50% of deaths occurred at a non-ICU level of care, despite admission to the appropriate care setting with normal staffing. The data imply a sudden,

unexpected deterioration in respiratory status requiring RRT/CA in a large number of non-ICU patients. Patients admitted to a non-ICU level of care suffer rapid clinical deterioration, often with a sudden decrease in oxygen saturation. These patients could benefit from additional monitoring (eg, continuous central oxygenation saturation), although this approach warrants further study.

[Establishing an enduring Military Trauma Mortality Review: Misconceptions and lessons learned](#)

Janak JC, et al.

J Trauma Acute Care Surg 2020;89(2S Suppl 2):S16-s25

Under direction from the Defense Health Agency, subject matter experts (SMEs) from the Joint Trauma System, Armed Forces Medical Examiner System, and civilian sector established the Military Trauma Mortality Review process. To establish the most empirically robust process, these SMEs used both qualitative and quantitative methods published in a series of peer-reviewed articles over the last 3 years. Most recently, the Military Mortality Review process was implemented for the first time on all battle-injured service members attached to the United States Special Operations Command from 2001 to 2018. The current Military Mortality Review process builds on the strengths and limitations of important previous work from both the military and civilian sector. To prospectively improve the trauma care system and drive preventable death to the lowest level possible, we present the main misconceptions and lessons learned from our 3-year effort to establish a reliable and sustainable Military Trauma Mortality Review process. These lessons include the following: (1) requirement to use standardized and appropriate lexicon, definitions, and criteria; (2) requirement to use a combination of objective injury scoring systems, forensic information, and thorough SME case review to make injury survivability and death preventability determinations; (3) requirement to use nonmedical information to make reliable death preventability determinations and a comprehensive list of opportunities for improvement to reduce preventable deaths within the trauma care system; and (4) acknowledgment that the military health system still has gaps in current infrastructure that must be addressed to globally and continuously implement the process outlined in the Military Trauma Mortality Review process in the future. LEVEL OF EVIDENCE: Level III.

[Reform of the death investigation system in Japan](#)

Ishihara K, and Iwase H

Med Sci Law 2020;60(3):216-22

The autopsy rate in Japan is lower than that in other countries, and most death investigations have historically been conducted by police officers through external inspection. Although medicolegal autopsy was not performed during the samurai administration, the European death investigation system was adopted in the second half of the 19th century and judicial autopsy began in universities' forensic medicine departments. After World War II, the medical examiner system was introduced under US influence, but it was only adopted in certain areas. Further reforms were introduced in the 21st century-in 2012, two laws relating to death investigation were enacted: The Act on Promotion of Death Investigation (Promotion Act), which provided foundational principles and included measures for investigating the causes of death and identification of bodies, and the Act on the Investigation of Cause of Death and on Identification of Bodies Handled by the Police, which recommended a procedure for death investigation, including a new autopsy system. The Death Investigation Promotion Program was to meant to be decided by the government in 2014. However, the relevant Act expired after it ran out of time. Later, in 2019, the Basic Act for Promotion of Death Investigation, the successor to the Promotion Act, was passed. This Act is significant because it sets the basic foundational principle and imposes plans created by the government. However, it remains unclear how these measures can be implemented, so further discussion and financial investment are now required.

[The impact of the national clinical outcome review programmes in England: a review of the evidence](#)

Heslop P, et al.

Clin Med (Lond) 2020;20(4):e52-e8

BACKGROUND: There is a lack of evidence about the effectiveness of the national clinical outcome review programmes in England. **METHODS:** We undertook a scoping review of the published literature for evidence of the impact of any of the current programmes or their predecessors, and asked programme leads to share examples of the impact of their work. Data were thematically analysed. **FINDINGS:** Evidence about impact related to clinicians' awareness and practice, structural aspects of healthcare, processes of care and patient outcomes. **CONCLUSIONS:** The national clinical outcome review programmes appear to have had significant impact, but none are funded to assess the outcome and impact of the recommendations they make or to deliver a programme of change. There is no structured and systematic way in which the findings and recommendations of each programme are taken forward, nor in which the findings from across programmes are collated and considered.

[Daily Dashboard produces sustained improvement in Critical Incident/ Learning Event reporting rate for Morbidity and Mortality Review Processes](#)

Gifford H, and Austin P

Journal of the Intensive Care Society 2020;21 (2 SUPPL):120-1

Background/Objectives: Critical incidents/learning events are common in critical care; reporting and analysis can assist staff in reducing related morbidity and mortality (M&M) (1). Previous research has shown that the use of structured reporting tools can assist staff learning (2). We aimed to improve the local monthly reporting rate via the use of daily surveillance tools. This took place in parallel with an intensification of M&M review processes to maximize learning. **Method(s):** We undertook a Quality Improvement Project in an eight bed Level 3 Intensive Care Unit in the East of Scotland over 24 months. Five improvement cycles included: (1) monitoring baseline critical incident reporting (2) introducing a five-question safety brief at the multidisciplinary ward round (e.g. drug and equipment problems) (3) changing the timing of the brief to handover (4) introducing a twelve-item dashboard of defined critical incidents/learning events (e.g. inadvertent hypoglycaemia) with weekly M&M meetings and monthly written dissemination of learning points (5) reducing written dissemination to bimonthly. Data were collected and analysed in Microsoft Excel 2017. **Result(s):** All critical incident/learning event reports were included. Mean staff concordance with the daily safety brief was low at the ward round (22.8%) and handover (30.0%), but very high with the daily dashboard (94.3%, Fig. 1). This was similar after reducing written dissemination from monthly to bimonthly (96.2% before, 91.8% after). The baseline rate of critical incident reporting was initially low (0-1/month, mean 0.2) and did not increase with the use of a safety brief (Fig. 2). The safety brief did record a significant number of incidents (0-13/month, mean 6.9) but did not capture detail. The daily dashboard, however, did increase the rate of detailed formal reporting (8-29/month, mean 15.9), resulting in near total capture (94.1%). **Conclusion(s):** Daily Dashboard use was associated with a dramatic improvement in staff engagement in critical incident reporting compared to safety briefing. The concurrent weekly M&M meetings and written summary reporting will have reinforced and rewarded daily dashboard use. Surveillance, regular review and dissemination forms part of the Ottawa M&M Model (3), recommended by the Scottish Mortality and Morbidity Programme (4). This systematic approach to critical incident/ learning event reporting can also be used to monitor future interventions and outcomes.

[Morbidity and Mortality Review in a University Dental Hospital: A Necessary Tool to Improve Quality of Care](#)

Esclassan R, et al.

Eur J Dent 2021

OBJECTIVE: The study aimed to describe and to analyze the first morbidity and mortality review (MMRs) set up within a Dental University Hospital using detailed case reports to highlight the benefits of MMRs for patients, practitioners, teachers and to implement appropriate protocols to prevent recurrence. **MATERIALS AND METHODS:** The MMRs were performed within the dentistry departments of the hospital over the 1-year study period. Each case was reviewed according to a protocol based on a tool defined by the Clinical Risk Unit and the Association of Litigation and Risk

Management (ALARM). RESULTS: Four cases were selected based on an oral report by a doctor from the dental service, a downstream service, or by the attending physician. The first case report related to a patient who suffered a breathing shock. The second concerned a tooth inhalation by a young disabled boy. The third was a therapeutic failure instigated by a student during a tooth preparation, and the fourth case involved an unexpected face-to-face meeting between a prisoner accompanied by police guards and an ancient victim at the dental hospital. DISCUSSION: Clinical incidents were investigated with the ALARM protocol. This process is also less focused on the individual who makes the error and more on contributing systemic factors. The systematic analysis of cases associated with bibliographic reviews improves learning and performance outcomes. Clear answers were given in response to the problems raised during these MMRs. CONCLUSION: In dental hospitals, the culture of MMRs needs to be integrated into resident training like in medical hospitals.

[Lessons to learn: Mortality of hemophilia patients](#)

Ayad A, et al.

Haemophilia 2020;26 (Supplement 3):43

The mortality review process is a common measure of healthcare quality, it is the process to address quality of care problems associated with patient deaths. Case I: 31 years old male is a case of hemophilia A without inhibitors who was admitted from ER by bleeding per rectum, Hb was 2 gm, resuscitation was done, later he developed tuberculous meningoencephalitis. Quality gaps were many since admission till death: Endoscopy, lab services, factor replacement, blood transfusion, patient transfer, admission to fever hospital, isolation rooms, ventilator care, hematology and hemophilia care in fever hospitals, and infection control. Case II: 42 years old male is a case of hemophilia A with inhibitors for the last 3 years. He was confused, feverish, having abdominal collection (Para pancreatic), then he developed septic shock and after that he was transferred to ICU and proved to have infective endocarditis. He passed away in ICU due to sepsis, bleeding, and respiratory failure. Quality gaps were in the management of hemophilia with inhibitors, central venous line insertion, microbiological workup, vasopressors, ventilator care, diagnosis of infective endocarditis, bed availability in ICU, isolation room beside social and family issues. Conclusion(s): It is mandatory for our unit to have morbidity and mortality reviewers and committee to find many quality gaps in particular unavailability of factor replacement, other preventable issues that contribute to patient care and limit the unpreventable issues related to patient mortality.

[Maternal deaths](#)

[Death audits and reviews for reducing maternal, perinatal and child mortality](#)

Willcox ML, et al.

Cochrane Database Syst Rev 2020;3(3):Cd012982

BACKGROUND: The United Nations' Sustainable Development Goals (SDGs) include reducing the global maternal mortality rate to less than 70 per 100,000 live births and ending preventable deaths of newborns and children under five years of age, in every country, by 2030. Maternal and perinatal death audit and review is widely recommended as an intervention to reduce maternal and perinatal mortality, and to improve quality of care, and could be key to attaining the SDGs. However, there is uncertainty over the most cost-effective way of auditing and reviewing deaths: community-based audit (verbal and social autopsy), facility-based audits (significant event analysis (SEA)) or a combination of both (confidential enquiry). OBJECTIVES: To assess the impact and cost-effectiveness of different types of death audits and reviews in reducing maternal, perinatal and child mortality. SEARCH METHODS: We searched the following from inception to 16 January 2019: CENTRAL, Ovid MEDLINE, Embase OvidSP, and five other databases. We identified ongoing studies using ClinicalTrials.gov and the World Health Organization (WHO) International Clinical Trials Registry Platform, and searched reference lists of

included articles. **SELECTION CRITERIA:** Cluster-randomised trials, cluster non-randomised trials, controlled before-and-after studies and interrupted time series studies of any form of death audit or review that involved reviewing individual cases of maternal, perinatal or child deaths, identifying avoidable factors, and making recommendations. To be included in the review, a study needed to report at least one of the following outcomes: perinatal mortality rate; stillbirth rate; neonatal mortality rate; mortality rate in children under five years of age or maternal mortality rate. **DATA COLLECTION AND ANALYSIS:** We used standard Cochrane Effective Practice and Organisation of Care (EPOC) group methodological procedures. Two review authors independently extracted data, assessed risk of bias and assessed the certainty of the evidence using GRADE. We planned to perform a meta-analysis using a random-effects model but included studies were not homogeneous enough to make pooling their results meaningful. **MAIN RESULTS:** We included two cluster-randomised trials. Both introduced death review and audit as part of a multicomponent intervention, and compared this to current care. The QUARITE study (QUALity of care, Risk management, and TEchnology) concerned maternal death reviews in hospitals in West Africa, which had very high maternal and perinatal mortality rates. In contrast, the OPERA trial studied perinatal morbidity/mortality conferences (MMCs) in maternity units in France, which already had very low perinatal mortality rates at baseline. The OPERA intervention in France started with an outreach visit to brief obstetricians, midwives and anaesthetists on the national guidelines on morbidity/mortality case management, and was followed by a series of perinatal MMCs. Half of the intervention units were randomised to receive additional support from a clinical psychologist during these meetings. The OPERA intervention may make little or no difference to overall perinatal mortality (low certainty evidence), however we are uncertain about the effect of the intervention on perinatal mortality related to suboptimal care (very low certainty evidence). The intervention probably reduces perinatal morbidity related to suboptimal care (unadjusted odds ratio (OR) 0.62, 95% confidence interval (CI) 0.40 to 0.95; 165,353 births; moderate-certainty evidence). The effect of the intervention on stillbirth rate, neonatal mortality, mortality rate in children under five years of age, maternal mortality or adverse effects was not reported. The QUARITE intervention in West Africa focused on training leaders of hospital obstetric teams using the ALARM (Advances in Labour And Risk Management) course, which included one day of training about conducting maternal death reviews. The leaders returned to their hospitals, established a multidisciplinary committee and started auditing maternal deaths, with the support of external facilitators. The intervention probably reduces inpatient maternal deaths (adjusted OR 0.85, 95% CI 0.73 to 0.98; 191,167 deliveries; moderate certainty evidence) and probably also reduces inpatient neonatal mortality within 24 hours following birth (adjusted OR 0.74, 95% CI 0.61 to 0.90; moderate certainty evidence). However, QUARITE probably makes little or no difference to the inpatient stillbirth rate (moderate certainty evidence) and may make little or no difference to the inpatient neonatal mortality rate after 24 hours, although the 95% confidence interval includes both benefit and harm (low certainty evidence). The QUARITE intervention probably increases the percent of women receiving high quality of care (OR 1.87, 95% CI 1.35 - 2.57, moderate-certainty evidence). The effect of the intervention on perinatal mortality, mortality rate in children under five years of age, or adverse effects was not reported. We did not find any studies that evaluated child death audit and review or community-based death reviews or costs. **AUTHORS' CONCLUSIONS:** A complex intervention including maternal death audit and review, as well as development of local leadership and training, probably reduces inpatient maternal mortality in low-income country district hospitals, and probably slightly improves quality of care. Perinatal death audit and review, as part of a complex intervention with training, probably improves quality of care, as measured by perinatal morbidity related to suboptimal care, in a high-income setting where mortality was already very low. The WHO recommends that maternal and perinatal death reviews should be conducted in all hospitals globally. However, conducting death reviews in isolation may not be sufficient to achieve the reductions in mortality observed in the QUARITE trial. This review suggests that maternal death audit and review may need to be implemented as part of an intervention package which also includes elements such as training of a leading doctor and midwife in each hospital, annual recertification, and quarterly outreach visits by external facilitators to provide supervision and

mentorship. The same may also apply to perinatal and child death reviews. More operational research is needed on the most cost-effective ways of implementing maternal, perinatal and paediatric death reviews in low- and middle-income countries.

[Early lessons from maternal mortality review committees on drug-related deaths-time for obstetrical providers to take the lead in addressing addiction](#)

Smid MC, et al.

Am J Obstet Gynecol MFM 2020;2(4):100177

PROBLEM: In the United States, maternal mortality review committees (MMRC) are providing compelling data that drug-related deaths are emerging as a leading cause of pregnancy-associated death (death during pregnancy or up to a year postpartum). Recommendations from the MMRC consistently highlight screening all pregnant and postpartum women for drug use and improving access to evidence-based substance use disorder and mental health treatment. Unfortunately, many providers lack the confidence, skills and necessary resources to screen for substance use, provide basic behavioral health services or facilitate referral to high-quality services in their clinical settings. Our profession's collective lack of response to a leading cause of maternal death represents a missed opportunity for potentially life-saving interventions. **A SOLUTION:** We call on our fellow obstetrician gynecologists to incorporate the lessons learned from MMRC and integrate addiction assessment and treatment into prenatal and postpartum care. Provider level integration of behavioral health services is, however, insufficient to fully address the magnitude of drug-related maternal deaths in the US. We, therefore, ask colleagues to address the structural/systemic barriers to care identified in MMRC. By doing so, we can prevent drug-related maternal deaths.

[Addressing Maternal Deaths in North Carolina: Striving to Reach Zero](#)

Small MJ, et al.

N C Med J 2020;81(1):55-62

Maternal mortality in North Carolina remains a challenge to families, health systems, and communities. The Maternal Mortality Review Committee is part of the process required to prevent these events. In this commentary, we present an abbreviated description of the 2014-2015 Maternal Mortality Review Committee report, set for publication in December, 2019.

[Averting Maternal Death and Disability in an Urban Network of Care in Dar es Salaam, Tanzania: A Descriptive Case Study](#)

Sequeira D'Mello B, et al.

Health Syst Reform 2020;6(2):e1834303

The non-governmental organization Comprehensive Community Based Rehabilitation in Tanzania (CCBRT) developed a multi-facility maternal and neonatal Network of Care (NOC) among 22 government hospitals and catchment facilities operating across Dar es Salaam. While facility delivery rates were above 90% in the Dar es Salaam region, the quality of services was substandard, leading to an excess of preventable maternal and neonatal morbidity and mortality. In partnership with the Dar es Salaam regional health authorities CCBRT developed a plan to improve the quality of service delivery at childbirth by through a system strengthening approach, capacitating lower-level facilities to provide routine care during pregnancy and uncomplicated deliveries, as well as improving care at secondary level referral hospitals and developing an inter-connected strengthened referral system. The Regional-CCBRT partnership implemented interventions across the continuum of care that included clinical training in basic and comprehensive emergency obstetric care, investments in infrastructure, and a rigorous maternal and perinatal death audit and follow-up program. Routine data generated were reflected upon at quarterly quality improvement meetings to follow up on problems identified. The government has initiated the replication of the model. This descriptive case study uses the four domains of the Networks of Care framework to document the wide-ranging efforts made to build and

maintain the CCBRT Network of Care in order to solve for specific challenges in maternal and neonatal health service delivery in the urban context of the Dar es Salaam region.

[The intersection of maternal morbidity and mortality and intimate partner violence in the United States](#)

Noursi S, et al.

Current Women's Health Reviews 2020;16(4):298-312

Background: In the United States, rates of maternal morbidity and mortality (MMM) are high compared with other high-income countries and are characterized by significant racial/ethnic disparities. Typically, research on MMM focuses on obstetrical problems. Less research examines the role of intimate partner violence (IPV). Maternal health, IPV, and their intersection are linked with the impacts of social determinants of health. Objective(s): We sought to understand the intersection of MMM and IPV in the United States, particularly data issues that hinder research in this area and the resulting knowledge gaps. Method(s): We identified major articles of interest regarding maternal morbidity and mortality and IPV in the United States and drafted a mini review based on relevant information. Result(s): Despite the prevalence of IPV during pregnancy, the intersection of maternal health and IPV has not been widely reviewed or discussed. Conclusion(s): There are a number of limitations in surveillance activities and data collection that underestimate the impact of IPV on MMM. Importantly, women who die by homicide or suicide- which in many cases is linked with IPV-are not counted as pregnancy-related deaths in the United States under the current definition. Establishing separate panels of local experts in maternal health or maternal mortality review committees (MMRCs) that are dedicated to examining violent deaths and use of the Maternal Mortality Review Information Application system would likely improve data accuracy of pregnancy-associated deaths. Based on the literature reviewed and limitations of current data, there are significant knowledge gaps on the effects of IPV and maternal health. Copyright © 2020 Bentham Science Publishers.

[Maternal Mortality From Coronavirus Disease 2019 \(COVID-19\) in the United States](#)

Metz TD, et al.

Obstet Gynecol 2020;136(2):313-6

Individual state maternal mortality review committees aim to comprehensively review all maternal deaths to not only evaluate the cause of death, but also to assess preventability and make recommendations for action to prevent future deaths. The maternal mortality review committee process remains critical during the coronavirus disease 2019 (COVID-19) pandemic. Maternal deaths due to COVID-19 have been reported in the United States. Some state maternal mortality review committees may choose to expedite review of these deaths in an effort to quickly provide clinicians with information intended to prevent other deaths during the ongoing pandemic. If states opt to pursue rapid review, entry of data into the Maternal Mortality Review Information Application system for submission to the Centers for Disease Control and Prevention will allow for aggregation nationally without duplication. It will be important to review not only deaths directly attributed to COVID-19, but also those that may be indirectly related to the COVID-19 pandemic, such as those influenced by changes in care practices or delays in seeking care during the pandemic. Therefore, regardless of the timing of the review, maternal deaths that occur during the time of the COVID-19 pandemic must be evaluated within that framework to ensure that all factors contributing to the death are considered to better understand the context of each of these tragic events.

[Our Mothers Are Dying: The Current State of Maternal Mortality in Hawai'i and the United States](#)

Maykin M, and Tsai SP

Hawaii J Health Soc Welf 2020;79(10):302-5

In the United States, maternal mortality, defined as all deaths during pregnancy, childbirth, and up to 365 days after the end of pregnancy, is among the highest of all developed nations. For every 1 maternal death, there are more than 100 life-threatening complications that occur related to pregnancy. However, maternal morbidity and mortality do not affect all mothers equally. Black and

indigenous people are at the highest risk for pregnancy-related complications and death—they are up to 5 times as likely to die from childbearing than white women. To understand this nationwide epidemic, cases of maternal death must be thoroughly reviewed, including the medical, social, and societal circumstances surrounding them. The state of Hawai'i formed the Maternal Mortality Review Committee in 2016 to review cases of maternal mortality, collect accurate data, and develop strategies for prevention. Twenty-five maternal deaths occurred in the state of Hawai'i from 2015 to 2017. More than half of these deaths were deemed preventable. Combined data show that mental health disorders played a significant role in maternal mortality, and approximately a quarter of cases involved substance use. Twenty-three percent of maternal deaths occurred in Native Hawaiian and Pacific Islander women, even though they make up a smaller proportion of women in the state. The collection and analysis of these data are the first steps toward understanding and reducing maternal morbidity and mortality in Hawai'i. Most notably, the striking ethnic disparities in maternal deaths and the preventable nature of many cases demand our immediate attention.

[Comparing internal and external severe maternal morbidity \(SMM\) review in Illinois](#)

Geller S, et al.

Obstetrics and Gynecology 2020;135 (Supplement 1):125S-6S

INTRODUCTION: A majority of states have implemented maternal mortality review committees, but Illinois is the only state to also implement facility-level, multidisciplinary review of SMM at all obstetric hospitals as recommended by the Centers for Disease Control and Prevention and American College of Obstetricians and Gynecologists. **METHOD(S):** Facility-level multidisciplinary SMM review was implemented in all perinatal networks in 2017 using a modified 2-factor scoring system recommended by CDC/ACOG (ICU admission and >4 units of packed red blood cells). A standing external, multidisciplinary SMM review committee was also established to review a subset of reviewed cases to improve the hospital review process and to compare external committee decisions to the internal review. **RESULT(S):** The external committee found 34% of SMMs were potentially preventable compared to 16% across internal review. In external review, the most common factors contributing to SMM was medical decision making, however internal review found pre-existing conditions and pregnancy complications as leading preventable factors. The external committee found more provider (63% vs 16%) and system (41% vs 16%) opportunities to alter SMM than the internal committees (patient factors). **CONCLUSION(S):** This study is the first to present findings on statewide implementation of SMM review both within hospital and by external committee and compare parallel facility-level and state-level review. External review shows more preventability and more provider and system opportunities to prevent SMM compared to internal review. External review by a multidisciplinary committee provided more opportunities to identify strategies to alter outcomes, however both offer opportunities for quality improvement and population-based findings.

[Lessons Learned Serving on a Long-Standing Maternal Mortality Review Committee](#)

Anderson FWJ, and Sokol RJ

Obstet Gynecol 2020;136(4):657-62

The maternal mortality ratio in the United States is increasing; understanding the significance of this change and developing effective responses requires a granular analysis of the contributing factors that a well-informed maternal mortality review committee can provide. Data collection and analysis, clinical factors, preventability, social determinants of health, and racial inequities combine to affect this outcome, and each factor must be considered individually and in combination to recommend a robust response. Obstetrician-gynecologists formed the State of Michigan's Maternal Mortality Review Committee (the Committee) in 1950 to identify gaps in care that needed to be systematically addressed at the time. In the early years, the Committee witnessed a reduction in the number of maternal deaths; over time, prioritization of maternal mortality decreased, yet the Committee witnessed changing patterns of death, varied data collection and evaluation processes, delayed reviews, and unimplemented recommendations. The calculation of the maternal mortality ratio was not informed by

the outcomes of Committee reviews. Today, the Committee, with increased support from the Michigan Department of Health & Human Services, can clearly identify and report preventable pregnancy-related mortality along with its causes and is close to achieving a near real-time surveillance system that allows the development of timely clinical and policy recommendations and interventions. The Committee's adaptations in response to the rise in maternal mortality have resulted in several lessons learned that may be helpful for currently operating committees and in the formation of new ones.

[Maternal mortality: beyond overmedicalized solutions](#)

Allan KR, .

Am J Obstet Gynecol MFM 2020;2(1):100047

Maternal deaths, particularly racial disparities in maternal deaths, represent a deeper problem than their medicalized solutions reflect—one deeply rooted in the devaluation of women's well-being, institutional inequality, and racism. Most policy solutions for addressing maternal mortality involve actionable goals within the purview of healthcare providers, medical institutions, and insurance providers. Although we should continue studying the causes of maternal mortality through maternal mortality review committees, reducing racism in medicine with implicit bias training, and standardizing pregnancy care, there is a pressing need to challenge the processes and institutions that lead to health inequities. A woman's income level, insurance status, housing stability, country of origin, gender identity, or skin color should not dictate how likely she is to die from a pregnancy-related cause.

Neonate, and infant deaths

[The process of implementing child mortality reviews in low- and middle-income countries: a narrative systematic review](#)

Young A, and Duke T

Trop Med Int Health 2020;25(7):764-73

OBJECTIVES: This review aims to describe the processes that have been used to implement child mortality reviews in LMICs and to identify the facilitators and barriers to their implementation and impact. This will help to inform healthcare professionals and managers planning to implement a child mortality review in their setting. **METHODS:** MEDLINE and Embase databases were searched for papers published between January 1996 and April 2019. Studies reporting the implementation of a child mortality review process in LMICs were considered eligible. A narrative approach was used to describe the stages in the audit process outlined in the WHO 'Operational guide for facility-based audit and review of paediatric mortality' which were completed, and to synthesise the barriers and facilitators to implementation and impact of the child mortality review process. **RESULTS:** From 776 potentially relevant articles, seven studies were included. In six studies, problems contributing to child deaths and possible solutions were identified, in four, these solutions were implemented, and in one, this implementation was monitored. Key factors influencing implementation and impact were attendance at meetings, use of a blame-free approach, allocating adequate human and financial resources to make changes, and level of engagement from leadership. **CONCLUSIONS:** Despite the common use of mortality reviews in paediatric departments, there are few studies published on this topic. The transition from identifying problems and solutions to implementing and monitoring action plans appears to be the most difficult aspect of the process, which requires commitment of adequate resources and strong leadership.

[Perinatal death audit and classification of stillbirths in two provinces in Papua New Guinea: A retrospective analysis](#)

Vallely LM, et al.

Int J Gynaecol Obstet 2020

OBJECTIVE: To undertake a retrospective perinatal death audit and assessment of avoidable factors associated with stillbirths among a cohort of women in two provinces in Papua New Guinea. **METHODS:** We used data from an ongoing cluster-randomized crossover trial in 10 sites among 4600 women in Papua New Guinea (from 2017 to date). The overarching aim is to improve birth outcomes. All stillbirths from July 2017 to January 2020 were identified. The Perinatal Problem Identification Program was used to analyze each stillbirth and review associated avoidable factors. **RESULTS:** There were 59 stillbirths among 2558 births (23 per 1000 births); 68% (40/59) were classified "fresh" and 32% as "macerated". Perinatal cause of death was identified for 63% (37/59): 30% (11/37) were due to intrapartum asphyxia and traumatic breech birth and 19% (7/37) were the result of pre-eclampsia. At least one avoidable factor was identified for 95% (56/59) of stillbirths. Patient-associated factors included lack of response to reduced fetal movements and delay in seeking care during labor. Health personnel-associated factors included poor intrapartum care, late diagnosis of breech presentation, and prolonged second stage with no intervention. **CONCLUSION:** Factors associated with stillbirths in this setting could be avoided through a package of interventions at both the community and health-facility levels.

[Standardized Criteria for Review of Perinatal Suicides and Accidental Drug-Related Deaths](#)

Smid MC, et al.

Obstet Gynecol 2020;136(4):645-53

OBJECTIVE: To estimate the proportion of accidental drug-related deaths and suicides classified as pregnancy-related from 2013 to 2014 (preimplementation of standardized criteria) and 2015 to 2016 (postimplementation). **METHODS:** Based on Centers for Disease Control and Prevention pregnancy-related death criteria, the Utah Perinatal Mortality Review Committee developed a standardized evaluation tool to assess accidental drug-related death and suicide beginning in 2015. We performed a retrospective case review of all pregnancy-associated deaths (those occurring during pregnancy or 1 year postpartum for any reason) and pregnancy-related deaths (those directly attributable to the pregnancy or postpartum events) evaluated by Utah's Perinatal Mortality Review Committee from 2013 to 2016. We compared the proportion of accidental drug-related deaths and suicides meeting pregnancy-related criteria preimplementation and postimplementation of a standardized criteria checklist tool using Fisher's exact test. We assessed the change in pregnancy-related mortality ratio in Utah from 2013 to 2014 and 2015 to 2016 using test of trend. **RESULTS:** From 2013 to 2016, there were 80 pregnancy-associated deaths in Utah (2013-2014: n=40; 2015-2016: n=40), and 41 (51%) were pregnancy-related (2013-2014: n=15, 2015-2016: n=26). In 2013-2014 (preimplementation), 12 women died of drug-related deaths or suicides, and only two of these deaths were deemed pregnancy-related (17%). In 2015-2016 (postimplementation), 18 women died of drug-related deaths or suicide, and 94% (n=17/18) of these deaths met one or more of the pregnancy-related criteria on the checklist (P<.001). From 2013 to 2014 to 2015-2016, Utah's overall pregnancy-related mortality ratio more than doubled, from 11.8 of 100,000 to 25.7 of 100,000 (P=.08). **CONCLUSION:** After application of standardized criteria, the Utah Perinatal Mortality Review Committee determined that pregnancy itself was the inciting event leading to the majority of accidental drug-related deaths or suicides among pregnant and postpartum women. Other maternal mortality review committees may consider a standardized approach to assessing perinatal suicides and accidental drug-related deaths.

[Reduction in perinatal mortality among small for gestational age babies in New Zealand](#)

Sadler L, et al.

Aust N Z J Obstet Gynaecol 2020

BACKGROUND: A significant reduction in perinatal mortality among births ≥ 1000 g has been observed in New Zealand. **AIM:** To determine, in a national cohort, if perinatal mortality has reduced in small for gestational age (SGA) and non-SGA babies. **MATERIALS AND METHODS:** Retrospective cohort, 2008-2016, of singleton non-anomalous births and perinatal deaths from 26+0 weeks gestation at birth in New Zealand. Perinatal deaths from the Perinatal and Maternal Mortality Review Committee data set were merged with the Ministry of Health national maternity data set. SGA was defined as less than the

10th customised birthweight centile using New Zealand coefficients. Perinatal mortality was defined as stillbirth from 26 weeks gestation and neonatal death up to the 27th day of life. RESULTS: There was a 30% reduction in perinatal mortality among SGA singleton non-anomalous babies at 26 weeks or more from 10.38/1000 births in 2008 to 7.28/1000 in 2016 ($P = 0.046$) but no significant change in mortality among appropriate and large for gestational age babies. CONCLUSION(S): There has been a significant reduction in perinatal mortality among SGA babies in New Zealand. The mechanism for this reduction is unclear.

[Degree of Post-Mortem Investigation Following Perinatal Death](#)

Nestander M, et al.

Pediatrics 2020;146 (1):154-5

Background: Perinatal death, defined as intrauterine fetal death at >20 weeks gestation, plus neonatal deaths within the first 7 days of life, rates have remained stable in the United States over the last decade. The American College of Obstetricians and Gynecologists have published guidelines for the post-mortem evaluation of stillbirths, with autopsy recommended. However, autopsy rates continue to decline. Less invasive post-mortem imaging has been suggested, but it is unclear if this is being incorporated into practice. Additionally, it is not known what evaluation early neonatal deaths receive and how the neonatal evaluation might differ from the stillbirth evaluation. Method(s): We conducted a single center retrospective review of all perinatal deaths from 2011-2017. We sought to determine the frequency and degree of post-mortem investigation to include autopsy, imaging, laboratory, and genetic studies. Result(s): Over a 7 year period there were 97 perinatal deaths, with 54 stillbirths (56%) and 43 neonatal deaths (44%). The majority of deaths occurred between 20-25 weeks (stillbirths, $n=31$; neonatal deaths, $n=30$). Only one case utilized less invasive post mortem imaging during the period examined. 91 cases had placental pathology completed (94%) and 29 deaths had autopsy performed (30%). Stillbirths were significantly more likely to receive autopsy ($p=0.013$) and post-mortem genetic testing ($p=0.0004$) when compared to neonatal deaths. Maternal parvovirus ($p=0.0001$), anti-phospholipid antibody ($p=0.003$), and Kleihauer-Betke ($p=0.005$) testing were all more likely in stillbirth post-mortem investigation than neonatal death. Neonatal deaths were more likely to have a documented physical exam ($p=0.002$) and be seen by a neonatologist or pediatrician ($p=0.0001$). Results were consistent in sub-group analysis of all deaths less than 26 weeks. Nearly a third of all deaths had no evaluation beyond placental pathology. Conclusion(s): Investigation following perinatal death is more likely in stillbirths than neonatal deaths and the use of less invasive methods is extremely limited in perinatal death investigation. Stillbirths were more likely than neonatal deaths to receive post-mortem investigation, yet all neonatal deaths were seen by a pediatrician or neonatologist. This suggests pediatricians and neonatologists may have room for improvement in completing a thorough investigation following perinatal death. Additionally, it appears there is minimal use of less invasive post mortem imaging when autopsy is declined. It is unclear if this is due to inconsistent offering or parental refusal of minimally invasive techniques. Methods to improve postmortem investigation following perinatal death are needed.

[Racial Inequities in Preventable Pregnancy-Related Deaths in Louisiana, 2011-2016](#)

Mehta PK, et al.

Obstet Gynecol 2020;135(2):276-83

OBJECTIVE: To examine preventable pregnancy-related deaths in Louisiana by race and ethnicity and maternal level of care to inform quality improvement efforts. METHODS: We conducted a retrospective observational descriptive analysis of Louisiana Pregnancy-Associated Mortality Review data of 47 confirmed pregnancy-related deaths occurring from 2011 to 2016. The review team determined cause of death, preventability, and contributing factors. We compared preventability by race-ethnicity and maternal level of care of the facility where death occurred (from level I: basic care to level IV: regional perinatal health center) using odds ratios (ORs) and 95% CIs. RESULTS: The rate of pregnancy-related death among non-Hispanic black women (22.7/100,000 births, 95% CI 15.5-32.1, $n=32/140,785$) was 4.1

times the rate among non-Hispanic white women (5.6/100,000, 95% CI 2.8-10.0, n=11/197,630). Hemorrhage (n=8/47, 17%) and cardiomyopathy (n=8/47, 17%) were the most common causes of pregnancy-related death. Among non-Hispanic black women who experienced pregnancy-related death, 59% [n=19] of deaths were deemed potentially preventable, compared with 9% (n=1) among non-Hispanic white women (OR 14.6, 95% CI 1.7-128.4). Of 47 confirmed pregnancy-related deaths, 58% (n=27) occurred at level III or IV birth facilities. Compared with those at level I or II birth facilities (n=2/4, 50%), pregnancy-related deaths occurring at level III or IV birth facilities (n=14/27, 52%) were not less likely to be categorized as preventable (OR 2.0, 95% CI 0.5-8.0). **CONCLUSION:** Compared with non-Hispanic white women, pregnancy-related deaths that occurred among non-Hispanic black women in Louisiana from 2011 to 2016 were more likely to be preventable. The proportion of deaths that were preventable was similar between lower and higher level birth facilities. Hospital-based quality improvement efforts focused on addressing hemorrhage, hypertension, and associated racial inequities may prevent pregnancy-related deaths in Louisiana.

Documentation and Reporting of Perinatal Deaths in Two Districts of Karnataka, India: A Situational Analysis

Kumar HNH, et al.

Indian Pediatr 2020;57(11):1006-9

OBJECTIVE: In Karnataka state, perinatal mortality rate is almost equal to infant mortality rate. This preliminary study was conducted in two districts of Karnataka to study potential problems to start of perinatal death audit. **METHODS:** Hospitals providing maternal and child health care services, which met study inclusion criteria, in Dakshina Kannada and Koppal Districts were included. Following variables were studied: (i) Documentation and reporting systems in these hospitals; (ii) Role of health care personnel in documentation and reporting (iii) Existing system of audit, if any. **RESULTS:** Totally 94 hospitals met our criteria with Dakshina Kannada District having 63 (67.02%) and the rest in Koppal District. Documentation and reporting was poor in Koppal District and inadequate in Dakshina Kannada district. Health care personnel were apprehensive about perinatal death audit. **CONCLUSION:** Problems identified need to be addressed before starting perinatal death audit.

Prospective study to explore changes in quality of care and perinatal outcomes after implementation of perinatal death audit in Uganda

Kirabira VN, et al.

BMJ Open 2020;10(7):e027504

OBJECTIVE: To assess the effects of perinatal death (PND) audit on perinatal outcomes in a tertiary hospital in Kampala. **DESIGN:** Interrupted time series (ITS) analysis. **SETTING:** Nsambya Hospital, Uganda. **PARTICIPANTS:** Live births and stillbirths. **INTERVENTIONS:** PND audit. **PRIMARY AND SECONDARY OUTCOME MEASURES:** Primary outcomes: perinatal mortality rate, stillbirth rate, early neonatal mortality rate. **SECONDARY OUTCOMES:** case fatality rates (CFR) for asphyxia, complications of prematurity and neonatal sepsis. **RESULTS:** 526 PNDs were audited: 142 (27.0%) fresh stillbirths, 125 (23.8%) macerated stillbirths and 259 (49.2%) early neonatal deaths. The ITS analysis showed a decrease in perinatal death (PND) rates without the introduction of PND audits (incidence risk ratio (IRR) (95% CI) for time=0.94, p<0.001), but an increase in PND (IRR (95% CI)=1.17 (1.0 to 1.34), p=0.0021) following the intervention. However, when overdispersion was included in the model, there were no statistically significant differences in PND with or without the intervention (p=0.06 and p=0.44, respectively). Stillbirth rates exhibited a similar pattern. By contrast, early neonatal death rates showed an overall upward trend without the intervention (IRR (95% CI)=1.09 (1.01 to 1.17), p=0.01), but a decrease following the introduction of the PND audits (IRR (95% CI)=0.35 (0.22 to 0.56), p<0.001), when overdispersion was included. The CFR for prematurity showed a downward trend over time (IRR (95% CI)=0.94 (0.88 to 0.99), p=0.04) but not for the intervention. With regards CFRs for intrapartum-related hypoxia or infection, no statistically significant effect was detected for either time or the intervention. **CONCLUSION:** The introduction of PND audit showed no statistically significant effect on perinatal

mortality or stillbirth rate, but a significant decrease in early neonatal mortality rate. No effect was detected on CFRs for prematurity, intrapartum-related hypoxia or infections. These findings should encourage more research to assess the effectiveness of PND reviews on perinatal deaths in general, but also on stillbirths and neonatal deaths in particular, in low-resource settings.

[Perinatal mortality audits and reviews: Past, present and the way forward](#)

Helps A, et al.

Eur J Obstet Gynecol Reprod Biol 2020;250:24-30

Perinatal deaths are devastating for families and staff involved. Failure to examine perinatal deaths for substandard care prevents learning and may lead to recurrence of events, as well as prolonged morbidity in bereaved families and hospital staff. Perinatal mortality reviews can identify factors contributing to suboptimal care. An integrative literature review was carried out to study the different types of perinatal mortality reviews currently being done internationally, establishing a comparison and examining promising new developments. We start by outlining issues with the classification of perinatal deaths and the different types of perinatal mortality reviews carried out in high-income countries. We reflect on the challenges that are encountered in the current processes and we then comment on how these may be overcome. Current literature shows that differences in classifications of perinatal deaths continue to impede important international comparisons. National perinatal mortality audits can provide reliable high-quality data to facilitate national and international benchmarking. Confidential enquiries give expert assessment on anonymised information to initiate system-wide improvements, but to provide local information on perinatal deaths unit-based multi-disciplinary team reviews are required. Additionally, there is a need to shift from a blame-culture to a focus on achieving best practice by learning from mistakes. Review tools and processes have been implemented in some countries to standardize perinatal mortality reviews, but there is still more work to be done. Involving the bereaved parents in the perinatal mortality review process is important and ways to achieve this are progressing. A structured approach to the perinatal mortality review process should be developed to facilitate sharing of experiences and challenges at national (or international) level. To achieve a reduction in the number of stillbirths and neonatal deaths, it is crucial to ensure that the perinatal mortality audit and review cycle is completed with implementation and re-evaluation of recommended changes in maternity services.

[Quality of investigations into unexpected deaths of infants and young children in England after implementation of national child death review procedures in 2008: a retrospective assessment](#)

Fleming P, et al.

Arch Dis Child 2020;105(3):270-5

OBJECTIVES: In 2008, new statutory national procedures for responding to unexpected child deaths were introduced throughout England. There has, to date, been no national audit of these procedures. **STUDY DESIGN:** Families bereaved by the unexpected death of a child under 4 years of age since 2008 were invited to participate. Factors contributing to the death and investigations after the death were explored. Telephone interviews were conducted, and coroners' documents were obtained. The nature and quality of investigations was compared with the required procedures; information on each case was reviewed by a multiagency panel; and the death was categorised using the Avon clinicopathological classification. **RESULTS:** Data were obtained from 91 bereaved families (64 infant deaths and 27 children aged 1-3 years); 85 remained unexplained after postmortem examination. Documentation of multiagency assessments was poorly recorded. Most (88%) families received a home visit from the police, but few (37%) received joint visits by police and healthcare professionals. Postmortem examinations closely followed national guidance; 94% involved paediatric pathologists; 61% of families had a final meeting with a paediatrician to explain the investigation outcome. There was no improvement in frequency of home visits by health professionals or final meetings with paediatricians between 2008-2013 and 2014-2017 and no improvement in parental satisfaction with the process. **CONCLUSIONS:** Statutory procedures need to be followed more closely. The implementation of a

national child mortality database from 2019 will allow continuing audit of the quality of investigations after unexpected child deaths. An important area amenable to improvement is increased involvement by paediatricians.

[Enhancing Obstetric Safety Through Best Practices](#)

Eppes CS, et al.

J Womens Health (Larchmt) 2020

The pregnancy-related mortality rate in the US exceeds that of other developed nations and is marked by significant disparities in outcome by race. This article reviews the evidence supporting the implementation of a variety of best practices designed to reduce maternal mortality. Evidence from maternal mortality review committees suggests that delays in diagnosis, delays in initiation of treatment and use of ineffective treatments contribute to preventable cases of maternal death. We review several protocols for maternal warning signs that have been used successfully to facilitate early identification and intervention. Care bundles, a collection of best practices, have been developed and implemented to address several maternal emergencies. We review the evidence that supports reduction in adverse outcomes with consistent implementation of obstetric hemorrhage and severe hypertension bundles in a collaborative, team-based setting. The article concludes with suggestions for the future.

[Evaluation of Concordance Between Original Death Certifications and an Expert Panel Process in the Determination of Sudden Unexplained Death in Childhood](#)

Crandall LG, et al.

JAMA Netw Open 2020;3(10):e2023262

IMPORTANCE: The true incidence of sudden unexplained death in childhood (SUDC), already the fifth leading category of death among toddlers by current US Centers for Disease Control and Prevention estimates, is potentially veiled by the varied certification processes by medicolegal investigative offices across the United States. **OBJECTIVE:** To evaluate the frequency of SUDC incidence, understand its epidemiology, and assess the consistency of death certification among medical examiner and coroner offices in the US death investigation system. **DESIGN, SETTING, AND PARTICIPANTS:** In this case series, 2 of 13 forensic pathologists (FPs) conducted masked reviews of 100 cases enrolled in the SUDC Registry and Research Collaborative (SUDCRRC). Children who died aged 11 months to 18 years from 36 US states, Canada, and the United Kingdom had been posthumously enrolled in the SUDCRRC by family members from 2014 to 2017. Comprehensive data from medicolegal investigative offices, clinical offices, and family members were reviewed. Data analysis was conducted from December 2014 to June 2020. **MAIN OUTCOMES AND MEASURES:** Certified cause of death (COD) characterized as explained (accidental or natural) or unexplained, as determined by SUDCRRC masked review process. **RESULTS:** In this study of 100 cases of SUDC (mean [SD] age, 32.1 [31.8] months; 58 [58.0%] boys; 82 [82.0%] White children; 92 [92.0%] from the United States), the original pathologist certified 43 cases (43.0%) as explained COD and 57 (57.0%) as unexplained COD. The SUDCRRC review process led to the following certifications: 16 (16.0%) were explained, 7 (7.0%) were undetermined because of insufficient data, and 77 (77.0%) were unexplained. Experts disagreed with the original COD in 40 cases (40.0%). These data suggest that SUDC incidence is higher than the current Centers for Disease Control and Prevention estimate (ie, 392 deaths in 2018). **CONCLUSIONS AND RELEVANCE:** To our knowledge, this is the first comprehensive masked forensic pathology review process of sudden unexpected pediatric deaths, and it suggests that SUDC may often go unrecognized in US death investigations. Some unexpected pediatric deaths may be erroneously attributed to a natural or accidental COD, negatively affecting surveillance, research, public health funding, and medical care of surviving family members. To further address the challenges of accurate and consistent death certification in SUDC, future studies are warranted.

[Protocols, practices, and needs for investigating sudden unexpected infant deaths](#)

Cottengim C, et al.

Forensic Sci Med Pathol 2020;16(1):91-8

Understanding case identification practices, protocols, and training needs of medical examiners and coroners (MEC) may inform efforts to improve cause-of-death certification. We surveyed a U.S.-representative sample of MECs and described investigation practices and protocols used in certifying sudden unexpected infant deaths (SUID). We also identified MEC training and resource needs. Of the 377 respondents, use of the SUID Investigation Reporting Form or an equivalent was 89% for large, 87% for medium, and 52% for small jurisdictions. Routine completion of infant medical history, witness interviews, autopsy, photos or videos, and family social history for infant death investigations was $\geq 80\%$, but routine scene re-creation with a doll was 30% in small, 64% in medium, and 59% in large offices. Seventy percent of MECs reported infant death investigation training needs. Increased training and use of standardized practices may improve SUID cause-of-death certification, allowing us to better understand SUID.

[Epidemiology of Sudden Death in a Population-Based Study of Infants and Children](#)

Burns KM, et al.

J Pediatr X 2020;2

OBJECTIVE: To describe epidemiologic data from the Sudden Death in the Young (SDY) Case Registry. Understanding the scope of SDY may optimize prevention efforts. **STUDY DESIGN:** We analyzed sudden, unexpected deaths of infants (<365 days) and children (1-17 years) from a population-based registry of 8 states/jurisdictions in 2015 and 9 in 2016. Natural deaths and injury deaths from drowning, motor vehicle accident drivers, and infant suffocation were included; other injury deaths, homicide, suicide, intentional overdose, and terminal illness were excluded. Cases were categorized using a standardized algorithm. Descriptive statistics were used to characterize deaths, and mortality rates were calculated. **RESULTS:** Of 1319 cases identified, 92% had an autopsy. We removed incomplete cases, leaving 1132 analyzable deaths (889 infants, 243 children). The SDY rate for infants was 120/100 000 live births and for children was 1.9/100 000 children. Explained Cardiac rates were greater for infants (2.7/100 000 live births) than children (0.3/100 000 children). The pediatric Sudden Unexpected Death in Epilepsy (SUDEP) mortality rate was 0.2/100 000 live births and children. Blacks comprised 42% of infant and 43% of child deaths but only 23% of the population. In all ages, myocarditis/endocarditis was the most common Explained Cardiac cause; respiratory illness was the most common Explained Other cause. SDY occurred during activity in 13% of childhood cases. **CONCLUSIONS:** Prevention strategies include optimizing identification and treatment of respiratory and cardiac diseases.

[Parent engagement in perinatal mortality reviews: an online survey of clinicians from six high-income countries](#)

Boyle FM, et al.

Bjog 2020

OBJECTIVE: Parent engagement in perinatal mortality review meetings following stillbirth may benefit parents and improve patient safety. We investigated perinatal mortality review meeting practices, including the extent of parent engagement, based on self-reports from healthcare professionals from maternity care facilities in six high-income countries. **DESIGN:** Cross-sectional online survey. **SETTING:** Australia, Canada, Ireland, New Zealand, UK and USA. **POPULATION:** A total of 1104 healthcare professionals, comprising mainly obstetricians, gynaecologists, midwives and nurses. **METHODS:** Data were drawn from responses to a survey covering stillbirth-related topics. Open- and closed-items that focused on 'Data quality on causes of stillbirth' were analysed. **MAIN OUTCOME MEASURES:** Healthcare professionals' self-reported practices around perinatal mortality review meetings following stillbirth. **RESULTS:** Most clinicians (81.0%) were aware of regular audit meetings to review stillbirth at their maternity facility, although this was true for only 35.5% of US respondents. For the 854 respondents whose facility held regular meetings, less than a third (31.1%) reported some form of parent engagement, and this was usually in the form of one-way post-meeting feedback. Across all six

countries, only 17.1% of respondents described an explicit approach where parents provided input, received feedback and were represented at meetings. CONCLUSIONS: We found no established practice of involving parents in the perinatal mortality review process in six high-income countries. Parent engagement may hold the key to important lessons for stillbirth prevention and care. Further understanding of approaches, barriers and enablers is warranted. TWEETABLE ABSTRACT: Parent engagement in mortality review after stillbirth is rare, based on data from six countries. We need to understand the barriers.

[Groundbreaking guidelines issued for unexplained pediatric death](#)

Bowen E, .

Contemporary Pediatrics 2020;37(6):18-20

The article discusses the national consensus guidelines issued for sudden unexplained death in childhood (SUDC) cases in the U.S. Topics explored include prevalence of SUDC according to the U.S. Centers for Disease Control and Prevention (CDC), the significant role of the family pediatrician during an incident of SUDC, and brief details about the death investigation, the trauma-informed protocols of hospitals, and case reviews of related child fatalities.

[An interdisciplinary, family-centered, undiagnosed disease model for the investigation of sudden unexpected death in pediatrics](#)

Blessing M, et al.

Modern Pathology 2020;33 (3):4

Background: Sudden infant death syndrome/sudden unexpected infant death (SIDS/SUID) and sudden unexplained death in childhood (SUDC) are poorly understood. Investigation of these deaths is under medicolegal (ML) system purview. However, several collaborative efforts with academic institutions have arisen as the need for expanded resources and a team approach to elucidate the mechanism/s of these deaths becomes clear. Our unique, family-centered model incorporates a large, interdisciplinary team to study SIDS/SUID and SUDC together as sudden unexpected death in pediatrics (SUDP). Design(s): We analyzed the process of our program dedicated to the investigation of SUDP, and measured its success. Result(s): The philanthropy and grant-funded program was founded in 2012 using the undiagnosed disease paradigm. It includes physicians specializing in primary care, genetics, neurology, endocrinology/metabolism, cardiology, radiology, palliative care, bereavement, neuropathology and pediatric pathology, researchers, and research laboratories. Participants are self-referred families whose previously well child died unexpectedly and without apparent cause have participated. All parent interactions explicitly incorporate bereavement support; individual and group counseling is provided. Following consent, diagnostic tissue, autopsy report and medical records are obtained from ML systems and prior healthcare providers respectively, and reviewed. Whole exome sequencing of decedent and parental DNA and secondary review of general and neuropathology is conducted, followed by exhaustive interdisciplinary review. When previously undiagnosed disease/s are established, these and other contributing factors are discussed with the family. In cases of heritable disease, referrals and anticipatory guidance is offered. In all cases, parents' worries are elicited and addressed. Publications in the program include novel findings on topics ranging from grief study to hippocampal malformation and high serum serotonin in these sudden and unexpected deaths. Conclusion(s): Our institutional program offers an alternative approach to traditional SUDP evaluation, providing family-centered care via a highly interdisciplinary clinical and research effort which encourages strategies and exploration within the scientific method framework. This approach models the undiagnosed disease paradigm and addresses largely overlooked needs in bereaved parents while moving closer to uncovering the biologic substrates of sudden unexpected death in pediatrics.

Vulnerable Adults

[Exclusion criterion: learning disability](#)

Spaul SW, et al.

Philadelphia, Pennsylvania: Lancet; 2020 p

In 2013 the UK Department of Health commissioned an independent Confidential Inquiry into the premature deaths of people with learning disabilities.[1] In response, the Learning Disabilities Mortality Review (LeDeR) programme, the first of its kind globally, was carried out by the Healthcare Quality Improvement Partnership on behalf of the UK National Health Service. We discovered that 15 853 (60-3%) of the studies excluded learning disability groups, none of the studies investigating pneumonia or sepsis included learning disability groups, and only 368 (1-4%) of all studies were specifically related to learning disabilities. 3 National Health Service England The learning disabilities mortality review (LeDeR) programme.

["It was emotional"—A group for people with learning disabilities to talk about end of life](#)

Reilly DE, et al.

British Journal of Learning Disabilities 2020;48(3):199-205

Accessible summary: People with a learning disability told us people do not talk to them about death. This is about a group we ran to help people learn about death and the end of their life. The group talked about people who had died and what might happen when they die. People in the group wanted help to talk to their own parents about what might happen when their parents die. People did not have enough information about the cost of funerals. The group was important as it helped people to learn. Some people made plans for what they would like to happen when they die. Background: Academic research and reports from healthcare professionals tell us people with learning disabilities are not routinely supported to learn about end-of-life issues or make plans for the end of their lives. Materials: Questionnaires were used to check how much people knew. Accessible symbols were used to help people understand end-of-life specific terms. Method: Partnering with a charity, three sessions were held in three consecutive weeks to ask people in a convened group what they wanted to know and help them learn. The sessions supported people to start creating their own plans for funerals, where they want to die and what should happen with their possessions. Results: This group had between 21 and 23 (N = 23) attendees each week and all except one person came back after the first week. The participants were keen to highlight what they did not know and learn about end-of-life issues. They also wanted support to plan for the end of their lives and their parents' lives, and the group tried to provide information and support on these topics. Conclusion: This group was a valuable exercise that was very much needed by local people with learning disabilities. The group will run again and should be offered in other areas. Groups of this kind can offer unmet needs that are highlighted by national guidance in England, UK such as the NHS long-term plan and the Learning Disability Mortality Review Programme.

[Establishing a national mortality review programme for people with intellectual disabilities: The experience in England](#)

Heslop P, et al.

J Intellect Disabil 2020:1744629520970365

In England, the national mortality review programme for people with intellectual disabilities, the LeDeR programme, was established in 2015. The programme supports local areas to review the deaths of all people with intellectual disabilities aged 4 years and over. Each death has an initial review; if indicated, a full multi-agency review takes place. The learning from the mortality reviews contributes to service improvements locally and nationally. This paper describes the programme's introduction and processes, exploring the challenges faced, and the successes achieved. It considers the background and rationale for the programme and the steps taken during its implementation, in order that others can learn from our experiences. Now the programme is established, its focus needs to shift so that we have a better understanding about how the findings of mortality reviews are leading to local and national service improvements and their impact.

[Reducing health inequalities for people with learning disabilities](#)

Ashmore H, .

Practice Nurse 2020;50(9):11-3

The article offers information on reducing health inequalities for people with learning disabilities. Topics include Learning Disabilities Mortality Review (LeDeR) programme has set up to evaluate premature mortality, the health inequalities among people with learning disabilities, and considering deaths in 2019 has concluded that overall avoidable deaths has accounted for deaths in people with learning disabilities.

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