NATIONAL CFRP
Center for Fatality Review & Prevention

June 2022

Effective Review of Stillbirths/Fetal Deaths

National Center Guidance Report

ACKNOWLEDGMENTS:

The National Center is funded in part by Cooperative Agreement Numbers UG7MC28482 and UG7MC31831 from the US Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB) as part of an award totaling $1,099,997 annually with 0 percent financed with non-governmental sources. Its contents are solely the responsibility of the authors and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.

We acknowledge and appreciate Kelly S. Gibson, MD, Maternal Fetal Medicine, Department of Obstetrics and Gynecology, Cleveland MetroHealth System. Dr. Gibson, a long-standing member of the National Center's Steering Committee, graciously reviewed the content of this guidance for medical clinical accuracy.

Table of Contents

Effective Review of Stillbirths/Fetal deaths

Introduction/Scope of the Problem

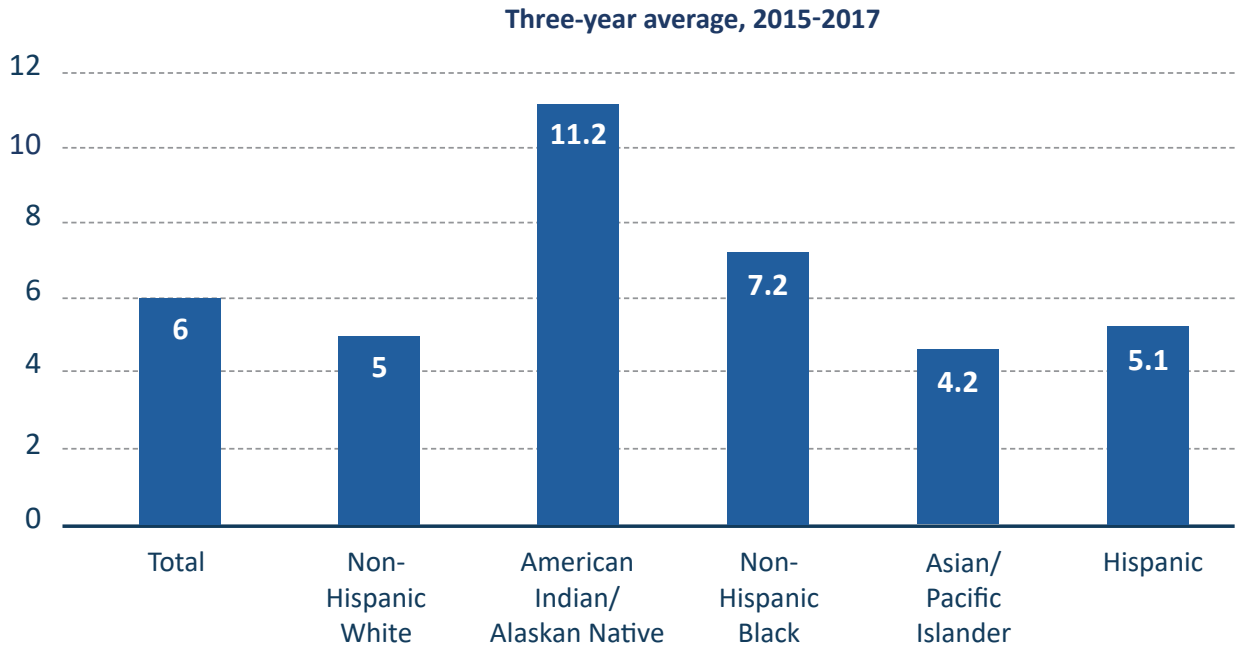
Stillbirth, or fetal death, affects about 1 in 160 births every year in the United States.[1] The US National Center for Health Statistics defines fetal death as the delivery of a fetus showing no signs of life as indicated by the absence of breathing, heartbeats, pulsation of the umbilical cord, or definite movements of voluntary muscles.[2] Stillbirth is further classified as either early, late, or term.

- Early stillbirth is a fetal death occurring between 20 and 27 completed weeks of pregnancy.
- Late stillbirth occurs between 28 and 36 completed pregnancy weeks.
- Term stillbirth occurs 37 or more completed pregnancy weeks.

There is variation among states for birth weight and gestational age criteria for reporting stillbirths. State standard definitions and reporting requirements for live births and fetal deaths are available from the Centers for Disease Control and Prevention's (CDC) website through the National Center for Health Statistics (URL: https://bit.ly/3zq0mZI). Annually, there are about 22,000 stillbirths reported in the US, equal to the number of infant deaths, or babies born alive who do not survive until their first birthday. The stillbirth rate has remained relatively stable over the years.

Racial and ethnic disparities in the rate of stillbirth are persistent. The three-year average stillbirth rate for non-Hispanic whites between 2015 and 2017 was 5.0 per 1,000 live births. This rate is similar to that for Asian or Pacific Islanders, who had a stillbirth rate of 4.2. In stark contrast, stillbirth rate for non-Hispanic blacks was 11.2, more than twice the rate for non-Hispanic whites. The rate for American Indian or Alaska Natives was 7.2, and the rate for Hispanics was 5.1.[3]

US Stillbirth Rates by Race and Ethnicity



Underlying these racial and ethnic disparities are social factors such as geography, access to education, experience with discrimination, trauma (including historical trauma), and access to physical and behavioral healthcare that can contribute to poor pregnancy outcomes. Residential, educational, and occupational segregation impacts access to high-quality education, employment opportunities, healthy foods, and physical and behavioral healthcare. Combined, these structural inequities have long-lasting health impacts, including adverse birth outcomes.

Causes and Contributing Factors

Unfortunately, a significant proportion of stillbirth remains unexplained, even after a thorough evaluation. Nearly half of all stillbirths do not have a known cause.[4]

In their joint practice bulletin, the American College of Obstetricians and Gynecologists (ACOG (URL: https://www.acog.org/about)) and the Society of Maternal Fetal Medicine (SMFM (URL: https://www.smfm.org/what-is-the-society)) identify the following causes of and contributors to stillbirth:[5]

- **Fetal growth restriction:** Fetal growth restriction (FGR) refers to a condition in which a fetus is unable to achieve its genetically determined potential size. Terms such as intrauterine growth restriction (IUGR) and small for gestational age (SGA) are often used in clinical practice interchangeably with FGR. FGR is identified through ultrasound estimation of fetal weight below the tenth percentile for a given gestational age.[6]

- **Placental abruption:** Placental abruption occurs when the placenta partly or completely separates from the inner wall of the uterus before delivery. This can decrease or block the developing infant's supply of oxygen and nutrients. Placental abruption can also cause life threatening problems for the birthing person, severe bleeding, shock due to blood loss, and possible kidney an other organ failure resulting from blood loss.

- **Chromosomal and genetic disorders:** In more than 1 of every ten stillbirths, the fetus had a genetic or structural disorder that probably or possibly caused the death.[7] The most common abnormalities leading to stillbirth are trisomy 21, monosomy X, trisomy 18, and trisomy 13.

  To explore *Reviews of Deaths Due to Congenital Disorders, go to* URL: https://ncfrp.org/wp-content/uploads/Report_Congenital_Disorders_Guidance.pdf

- **Problems with the umbilical cord:** Problems with the umbilical cord are considered a probable or possible cause of about 1 in ten stillbirths.[8] Cord abnormalities such as vasa previa (when some of the blood vessels that connect the umbilical cord to the placenta are lying over or near the entrance to the birth canal), ruptured cord, cord entrapment, cord prolapse, cord occlusion, or knots in the umbilical cord may cut off oxygen to the developing fetus. This cause of stillbirth tends to occur more later in pregnancy.

- **Infection:** In more than 1 of every ten stillbirths, the death was likely caused either by an infection in the fetus or the placenta or by a serious infection in the birthing parent. Infections were a more common cause of death in stillbirths before week 24 than in those after. Viral infections associated with stillbirth include cytomegalovirus, parvovirus, Zika, and most recently, COVID-19.[9] It is important to consider whether any increase in the rate of stillbirth is due to the direct or indirect effects of the COVID-19 pandemic. Direct effects are those caused by SARS-CoV-2 infection, while indirect effects are those resulting from changes in access to healthcare or the behavior of pregnant individuals or clinicians during the COVID-19 pandemic. For additional guidance on identifying and documenting indirect deaths due to COVID-19, see the National Center's Supplemental Guidance on Reviewing Deaths During COVID-19 (URL: https://bit.ly/3NQiBuV) and COVID -19 During Pregnancy: Exploring Birth and Infant Outcome through Fatality Review (URL: https://bit.ly/3a55Ldv).

Risk Factors

Risk factors for stillbirth can be grouped into two categories: modifiable and those that are not. The modifiable factors that increase the risk of stillbirth that have been most widely studied in the literature are the use of substances (smoking, alcohol, illicit and prescribed drugs), weight management, attendance at antenatal care, and sleeping position.[10] These factors are able to be addressed during the course of the pregnancy to decrease risk. Non-modifiable risk factors include social determinants of health and obstetric history.

Modifiable

Smoking: There is clear dose-response effect of smoking in pregnancy on the risk of stillbirth. Overall, those who smoke during pregnancy have a 47% increased risk of stillbirth, and the risk of stillbirth rises as the number of cigarettes smoked per day increases.[11] Exposure to secondhand smoke also increases risk. Pregnant persons exposed to secondhand smoke are estimated to be 23% more likely to experience stillbirth than non-smokers without exposure.[12]

Substance use: The use of cocaine, methamphetamine, marijuana, and other illicit drugs in pregnancy contribute to placental abruption and stillbirth.[13]

Prescribed medications: Prescription pain medication, when taken in the first trimester, has been strongly associated with stillbirths due to congenital disorders. First and second trimester use of prescription pain or migraine medication has been positively associated with all stillbirths. Fertility drugs have been positively associated with stillbirths, especially those attributed to complications of the placenta, cord, and membranes.[14]

Alcohol: Heavy use of alcohol during pregnancy has been associated with a range of negative birth outcomes, including increased risks of miscarriage, stillbirth, and infant mortality.[15]

Obesity and gestational weight gain: Obesity is defined as a pre-pregnancy body mass index (BMI) of 30 and greater. Obesity in pregnancy is associated with an increased risk of early fetal loss and stillbirth. For childbearing persons who begin the pregnancy either overweight or obese, excessive weight gain during the pregnancy is associated with an even higher risk of stillbirth.[16]

Prenatal care: Earlier perinatal care could assist in the early identification and treatment of risk factors for stillbirth, especially those that are preventable. Early and regular prenatal care provides the opportunity to identify and address risk factors, including strategies that aim to prevent stillbirth, such as nutrition and prevention and management of infections.

Sleep position: Sleeping supine (on one's back) in late pregnancy is associated with an increase in the odds of stillbirth, independent of other common risk factors.[17] Back sleeping may compress the large vessels carrying blood to and from the heart to the rest of the body, causing a reduction of blood flow and decreased cardiac output. In turn, this may reduce uterine and placental perfusion and decrease fetal oxygenation.[18]

Trauma: Physical trauma, such as a car crash, can result in a stillbirth.

Non-modifiable

Social demographic factors: Conditions in the places where people live, learn, work, play, and worship affect a wide range of health risks and outcomes, including stillbirth. Disparities in health care delivery and services, environmental stressors, biases, and racism all contribute to the risk for adverse pregnancy outcomes in persons of color, including stillbirth. In addition, poor nutrition, exposure to pollutants, and excessive family stress associated with poverty and other forms of economic or social disadvantage can disrupt developing immune and metabolic systems, leading to a greater risk for stillbirth.[19] Research also has shown that pregnant persons who experienced financial, emotional, or other personal stress (URL: https://bit.ly/3GxTryE) in the year before their delivery had an increased chance of having a stillbirth.[20]

Multiple gestation: Stillbirths are more common in birthing persons carrying twins, triplets, and higher-order multiples.[21] The higher stillbirth rates may be due to complications specific to multiple gestation, such as twin to twin transfusion syndrome and increased risk for congenital disorders and growth restriction.[22]

Past obstetric history: Birthing persons who have had a previous stillbirth are at increased risk of recurrence. Persons with a previous poor pregnancy outcome, such as preterm delivery, growth restriction, and preeclampsia, are at increased risk of stillbirth in subsequent pregnancies.

Young or old age: The age of the birthing person at either end of the reproductive age spectrum (less than 15 years and greater than 35 years) is an independent risk factor for stillbirth. Being over 35 is associated with an increased risk of stillbirth in birthing persons with no live births (nulliparous) and birthing persons who have given birth more than once (multiparous).[23]

Comorbid medical conditions: Several medical conditions are associated with an increased risk of stillbirth. Hypertension and diabetes are two of the most common. Studies have noted a substantial joint effect between pregestational diabetes and obesity. Together, these risk factors are stronger than the individual effects of each risk factor independently.[24] In addition, other medical conditions, such as lupus erythematosus, renal disease, uncontrolled thyroid disease, cholestasis of pregnancy (liver disease), and clotting disorders (such as hemophilia) have been associated with stillbirth.

Assisted Reproductive Technology (ART): Pregnancies achieved by in vitro fertilization (IVF) appear to be associated with an elevated risk (twofold to threefold increase) of stillbirth even after controlling for age, parity, and multiple gestations.[25]

Late-term and post-term pregnancies: A pregnancy that lasts from 41 weeks to 42 weeks gestation is called "late-term." Post-term pregnancy is a pregnancy that extends beyond 42 weeks of gestation. The incidence of stillbirth is increased in both late-term and post-team pregnancies. At 40 weeks gestation, the risk of stillbirth is 1 in 926 pregnancies, 1 in 826 at 41 weeks, 1 in 769 at 42 weeks, and 1 in 633 at 43 weeks.[26] Uteroplacental insufficiency, asphyxia, and intrauterine infection all contribute to these excess deaths.

Preparing to Review Cases

Consider Unconscious Bias and Health Equity

The underlying reasons for the observed racial and ethnic disparities in fetal deaths are not fully understood. Some factors contributing to these disparities include differences in preconception health, socioeconomic status, access to quality health care, stress, and racism, including institutional bias.[27]

Fatality review teams obtain information to provide context on the death of an unborn baby, infant, or child. Social factors such as geography, access to education, experience with discrimination, trauma (including historical trauma), and access to physical and behavioral healthcare can contribute to stillbirths. Residential, educational, and occupational segregation impacts access to high-quality education, employment opportunities, healthy foods, and physical and behavioral health care. Combined, these structural inequities have long-lasting health impacts, including adverse birth outcomes.

> The fatality review process is not a time to blame families for poor outcomes, even if there were behavioral contributors that increased risk. Instead, it is an opportunity to determine how systems-level factors influence families' options, access, and behaviors.

Case review teams should provide an opportunity for members to consider how unconscious bias may contribute to assumptions in case review with every case, regardless of the cause of death. A tool for recognizing bias and discriminating in medical and social service records is available at: https://ncfrp.org/wp-content/uploads/FIMRTools-Recognizing-bias-in-records-abstraction_TipSheet.pdf.

Educate team members

Before holding a review of fetal deaths, it may be helpful to educate review team members on some of the common causes and contributors to stillbirths. Having accurate information about the condition of the birthing person and the risk factors will ensure team members all understand the case in the same way. Non-medical team members will benefit from an overall understanding of the common terms, prevalence, and risk factors. Consider providing team members with fact sheets, using information from reliable sources, such as the CDC or a state or local health department that explore key indicators on stillbirth and social drivers of health. The Star Legacy Foundation (URL: https://starlegacyfoundation.org) is a non-profit organization whose mission is to increase awareness, support research, promote education, and encourage advocacy and family support regarding stillbirth, pregnancy loss, and neonatal death. They have created a Stillbirth Scorecard for the US and each state to help communities understand the status of stillbirth and to look at some key indicators. Scorecards can be accessed here: https://starlegacyfoundation.org/us-2017-stillbirth-scorecard.

Star Legacy Foundation:

The Stillbirth Scorecard is designed to bring stillbirth out of the shadows and raise collective awareness about the number of families being impacted by these deaths every day. Before we can fix this problem, it must be understood.

Convene the right partners

Typically, membership on a FIMR case review team will include obstetricians, midwives, doulas, pediatricians, nurses, social workers, public health professionals, child welfare, home visitors, and many disciplines who care for and touch the lives of childbearing parents and families. Core members of Child Death Review (CDR) teams usually include representatives from law enforcement, child protective services, prosecutor/district attorney, medical examiner, public health, pediatrician, and emergency medical services. To examine cases of fetal death or stillbirth, teams may want to consider adding a variety of review members with added expertise, such as:

- Racial & Ethnic Consumer/Advocacy Groups
- Perinatologists, or Maternal Fetal Medicine specialists
- Infectious disease specialists
- Neonatologists/neonatal nursing
- Pathologists
- Anesthesiologists
- Geneticists
- Perinatal bereavement professionals

To take advantage of the added expertise, review teams may want to consider "cluster" reviews where a larger number of stillbirth cases can be reviewed together. A guidance document for planning for high volume or "batch" reviews can be accessed here: https://ncfrp.org/wp-content/uploads/NCRPCD-Docs/Planning-For-Batch-Fatality-Reviews.pdf

Review to improve and prevent

Fatality review should always focus on prevention and should lead to effective recommendations that improve the systems of care and resources for birthing persons, infants, children, and families. It can be challenging for teams to determine why a stillbirth occurred. The need to reduce stigma and fatalism related to stillbirth and to improve bereavement care is also clear. This can complicate the process of making recommendations. In these instances, teams should consider what factors may have increased risk, even if there is no direct causal relationship between risk factors and outcomes. Regardless of whether a team determines that a stillbirth could have been prevented, it is important to focus on what services were, or should have been, available to families and if there were ways service delivery and care could be improved in these instances.

Prioritize the family experience

Interviews should be attempted in all case reviews of stillborn infants. The personal narratives bereaved parents share may provide uniquely insightful information about their experiences before, during, and after the death of their babies. These insights are not available from any other source, and they have implications for fatality review programs and interventions that benefit from quantitative data elements. Strategies to address problems at the local level are most effective when vital statistics are considered alongside families' personal stories. Analyzing and abstracting available records provide only part of the story. In addition, the parental interview will inform the team about navigating care and referral systems, what aspects are working well, and what family needs remain unmet. Stories can humanize and heal, deepen understanding and motivate action, and render greater impact for systems change. Storytelling also may help individuals experiencing loss, knowing that sharing their narrative may help prevent another family from going through a similar tragedy.

Data collection

The National Fatality Review Case Reporting System (NFR-CRS) (URL: https://bit.ly/3LYwTIh) is a web-based data system that allows for data entry, provides standardized data reports, and basic data visualizations. The National Center offers consistent technical support to equip fatality review teams to collect standardized case review information to drive prevention. The NFR-CRS collects variables on birthing parents, risk factors, socioeconomic and demographic factors, environmental factors, and life stressors that may have played a role in fetal death. This information is gathered through a rigorous abstraction process of relevant case records. NFR-CRS data should be used in conjunction with other data sources.

Additional data sources can provide regional, population-level data on stillbirths. Fatality review teams and their partners often choose to examine fatality review findings and data alongside population-level statistics to have a clear understanding of the overall burden of poor outcomes and the rich information collected through multidisciplinary case reviews. Fetal death data is published annually by the National Center for Health Statistics (URL: https://bit.ly/3Mi23e9) in reports and individual-record data files.

Other Examples of Population Data include:

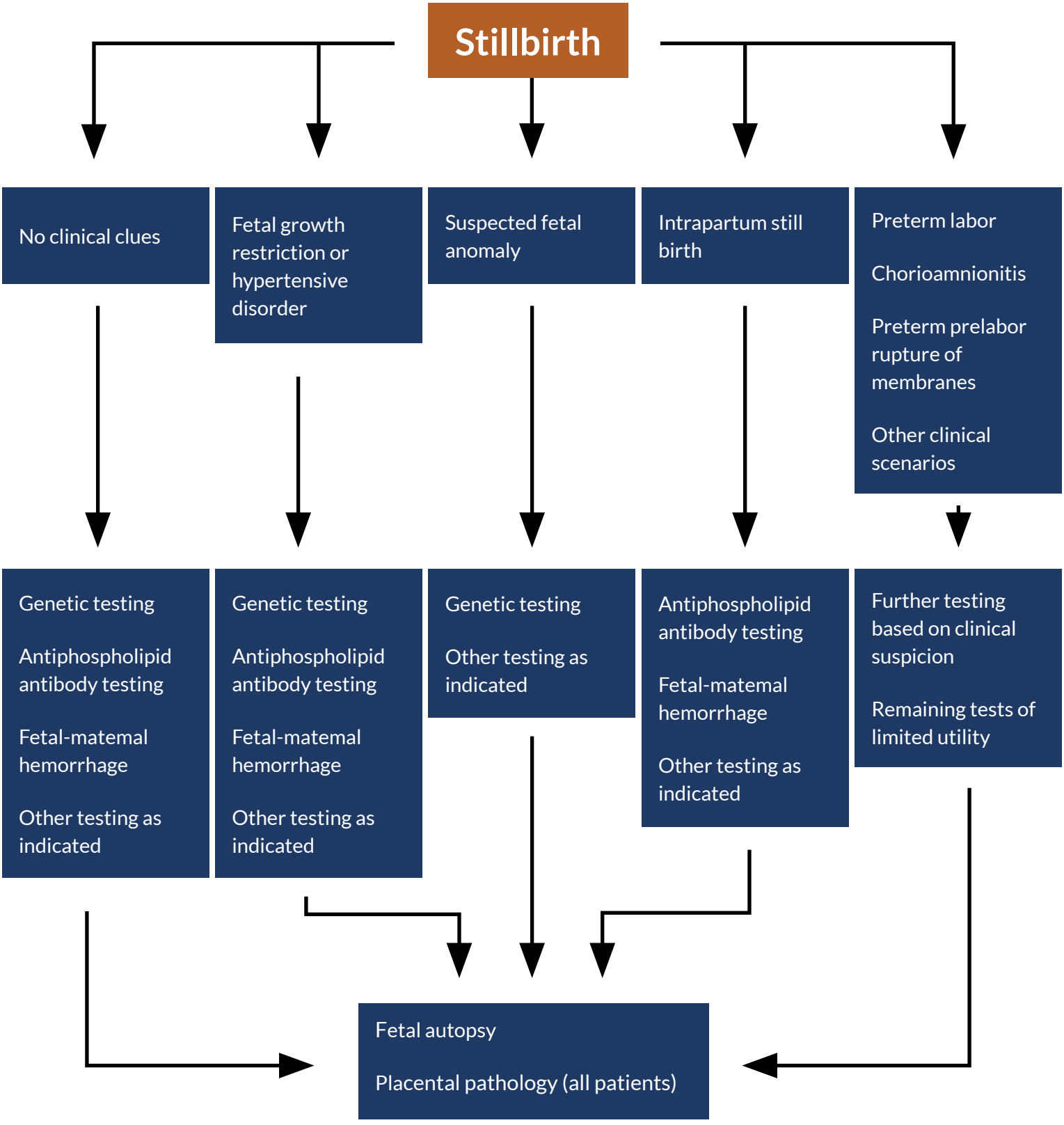
- Vital records (consists of all live births and fetal deaths)
- Census data (consists of all people or households)
- The Census Bureau's American Community Survey (represents all people or households)
- Pregnancy Risk Assessment Monitoring (PRAMS—represents all live births)
- The Study of Associated Risks of Stillbirths (SOARS–an ongoing, state-specific, population-based survey designed to collect information on experiences and behaviors before, during, and immediately following pregnancy among birthing persons who have recently experienced a stillbirth)
- Behavioral Risk Factor Surveillance System (BRFSS—represents adults)

Elements of a stillbirth evaluation

Following a stillbirth, parents and providers want and need answers. Feelings of guilt or even anger are common. After a stillbirth, health care providers should try to determine why the baby died and help the family cope with their loss. Later, if the family wants to try for another pregnancy, having these answers may help change any problems that might increase the risk of another stillbirth.

Evaluation of stillbirth should include fetal autopsy; gross and histologic examination of the placenta, umbilical cord, and membranes; and genetic evaluation.[28] ACOG provides the following algorithm for evaluation:[29]

Figure 1: Evaluation of Stillbirth



Examination of the Placenta

Gross and microscopic examination of the placenta, umbilical cord, and fetal membranes by a trained pathologist is the single most useful aspect of the evaluation of stillbirth and is an essential component of the evaluation.[30] Conditions such as abruption, umbilical cord thrombosis, and abnormal cord insertion may be revealed, as well as information regarding infection, genetic abnormalities, and anemia.

Examination of the Infant

The general examination of the stillborn fetus should be done promptly, preserving the parents' and family's privacy and need for bereavement care. Careful inspection should take note of the weight, length, and head circumference. A thorough identification of any dysmorphic features of the infant, a condition in which part of the body is a different shape or appearance from normal, by a skilled examiner can yield important findings and direct the health care team in providing appropriate information and resources for parents. This exam will include general appearance and posture, the skin, head, and neck, with special attention paid to the infant's eyes, ears, nose, and mouth. The extremities, chest, and abdomen should be examined for size, symmetry, and structure. Finally, genitalia are inspected to identify the infant's gender.[31]

Fetal Autopsy

A fetal autopsy should be offered to families because it is one of the most useful diagnostic tests in determining the cause of death. It is preferable to have a pathologist who is experienced in perinatal autopsy. It is critical to give parents the opportunity to hold the baby and perform cultural or religious activities before the autopsy.

Laboratory Studies

In addition to the placental pathology, the laboratory aspect of the clinical workup following a stillbirth should include karyotype, toxicology screen, syphilis serology, antibody screen, fetal–maternal hemorrhage testing, and testing for antiphospholipid antibodies.

Records Needed

The following is a list of records typically needed to do an effective review of fetal deaths. For FIMR, an experienced case abstractor will have already gathered as much information as possible and created a de-identified case summary for the Case Review Team to examine. For CDR, records will be available at the review meeting through the various participating CDR members. The following is a list of records typically needed to review stillbirths. Note: Not all states will have standard certificates of birth and fetal death.

- ☐ **Birth/death certificate, fetal death certificate**
- ☐ **Health records of the birthing person, including:**
  - ○ Complete family health history
  - ○ Preexisting health conditions of the birthing person
  - ○ Obstetric history
  - ○ Prenatal care records, including any medical conditions complicating pregnancy, ultrasounds, diagnosis of infections, vaccinations during pregnancy, abdominal trauma
  - ○ Amniocentesis results (if performed)
  - ○ Labor and delivery records (antepartum, delivery, postpartum)
  - ○ Emergency Department (ED) records (birthing person's visits to ED during pregnancy)
  - ○ Relevant lab results
  - ○ Placental pathology
- ☐ **Fetal Autopsy**
- ☐ **Karyotype and any relevant genetic workup**
- ☐ **Social work consults, inpatient and outpatient**
- ☐ **Any support services utilized, including WIC and Family Planning**
- ☐ **Mental health records and services**
- ☐ **Substance use disorder records and services**
- ☐ **Home visitation service summaries**
- ☐ **Parental/family interview, if available**
- ☐ **Insurance coverage**

Key Questions to Ask During the Review Meeting

Because risk factors for stillbirths are multifaceted, with overlapping factors of influence, fatality review teams may need to ask different questions during these case reviews. Teams should carefully examine the family medical history, including stressors and exposures the birthing person may have encountered before or during pregnancy. Teams may choose to use the following questions to understand the case better and capture all the pertinent data with an eye toward prevention.

- Is there a detailed family history?
- Consider the pregnancy history of recurrent miscarriages or other pregnancy losses, including previous stillbirths. Do the biological parents or other family members have medical problems, such as hypertension, diabetes, or cardiovascular disease?
- Consider the personal medical history of the birthing person. Was there documentation of:
    - Recurrent miscarriages
    - Previous child born with a birth disorder, hereditary condition, or FGR
    - Gestational hypertension or preeclampsia in a previous pregnancy
    - Gestational diabetes in a previous pregnancy
    - Previous placental abruption
    - Previous stillbirth
- If the birthing person had any medical conditions that required special care during pregnancy, such as anemia, epilepsy, diabetes, or high blood pressure, was preconception and inter-conception care and counseling available?
- Was prenatal care comprehensive, acceptable, accessible, appropriate, and culturally responsive?
- Were the parents and other family members aware of the need for skilled care during pregnancy and birth? Were they aware of the warning signs of problems during pregnancy? Were there any other sociocultural factors or barriers?

- Did the necessary health services and facilities exist, and were they accessible? Was distance or cost a factor? If there was a delay traveling to the healthcare facility after a problem was identified, what were the reasons?
- Did prenatal care include assessing and providing services for the modifiable and non-modifiable risk factors for stillbirths?
- Were the birthing parent and family members given information on fetal movement monitoring, such as “Count the Kicks?”
- Were the family’s mental health and stress issues identified and addressed?
- Were there any times when the family felt treated differently or unfairly in seeking and receiving care and services?
- Was there any bias identified in the provision of care and services?
- Were there adequate and appropriate resources in place to support the parents/family?
- Were there any services the family needed or could have benefited from that they could not access or receive?
- Were appropriate parental counseling, communication, and emotional support given to the family?

Opportunities for Prevention

Prevention of stillbirths can be categorized into two distinct groupings: prevention for those with a previous stillbirth, and prevention in general for pregnant persons without history of stillbirth.

For management of pregnant persons without history of stillbirth, the primary strategies for prevention revolve around assessment and treatment of the specific conditions, such as hypertension or diabetes, that place the pregnant person at risk for stillbirth. Surveillance of the developing baby through doppler and ultrasound should be a regular part of managing such patients. Helping improve birthing persons' overall health, including managing preexisting conditions and lifestyle choices, improve the chances of a successful pregnancy.

Multiple studies have demonstrated that pregnant persons who report decreased fetal movement are at increased risk for adverse perinatal outcomes. Fetal kick counting is an inexpensive and non-invasive test for measuring fetal well-being. Best practices regarding fetal kick counting seem to involve encouragement of awareness of fetal movement patterns, being attentive to the complaint of reduced fetal movements, systematically addressing the complaint, and the use of shared decision making to employ interventions safely.[32]

A systematic review of research in health care and health policy, published in the Cochrane Database (URL: https://bit.ly/3PSI7BI), summarized the evidence on the effects of antenatal interventions for preventing stillbirth for low-risk or unselected populations of birthing persons.[33] The overview shows clear evidence that:

- **Midwife-led care reduces the risk of stillbirth in early gestation (before 24 weeks) compared with other types or 'models' of care.**

The overview shows that other interventions are **probably** effective in reducing the risk of stillbirth, also depending on the specific context and populations in which they are used, including:

- **Giving pregnant persons balanced energy and protein supplements**
- **Training for traditional birth attendants**
- **Routine Doppler ultrasound used in fetal or umbilical vessels (a test to estimate blood flow)**
- **Computerized antenatal cardiotocography to monitor the developing infant's well-being in the womb (using a computer to record measurements of the baby's heart rate and contractions)**

Additional interventions were *possibly* effective in preventing stillbirth or perinatal death:

- **Community-based intervention packages,** including community support groups, community mobilization, home visitation, and training traditional birth attendants to make home visits may reduce the risk of stillbirth compared with not having these interventions.

- **Single Doppler ultrasound used in fetal or umbilical vessels** may reduce the risk of perinatal death compared with no Doppler ultrasound.

Management of subsequent pregnancies after a stillbirth requires a deeper level of surveillance and monitoring. ACOG and the SMFS recommend these preventive measures for birthing persons with a previous stillbirth:

1. **Pre-pregnancy and Initial Prenatal Visit**
    a. Obtain a detailed medical and obstetric history, including evaluation and workup of the previous stillbirth, and determination of recurrent risk
    b. Smoking cessation counseling
    c. Weight loss in obese persons (pre-pregnancy only)
    d. Genetic counseling if family genetic conditions exist
    e. Diabetes screen

2. **First Trimester**
    a. Dating ultrasound
    b. Genetic screening

3. **Second Trimester**
    a. Fetal ultrasound anatomy scan at 18 – 20 weeks gestation
    b. Performance of single marker alpha-fetoprotein test (to estimate the chance that the baby may have neural tube defects or other congenital disorders)

4. **Third Trimester**
    a. Ultrasound testing for fetal growth restriction after 28 weeks of gestation
    b. Antepartum fetal surveillance using umbilical artery doppler and ultrasound to assess fetal heart rate patterns. Increased antepartum fetal surveillance should start at 32 weeks of gestation or 1 – 2 weeks earlier than the previous stillbirth.

5. **Delivery:** Planned delivery at 39 weeks of gestation. Decisions to deliver early need to be weighed against the risks of neonatal complications with early-term birth compared to the potential benefit.

Throughout the entire pregnancy, emotional support and reassurance is critical. Clear communication of test results and engaging families in shared decision making is vital.

Recommendations

The opportunities for prevention discussed above should guide the recommendation process. Fatality review teams can document findings and make recommendations based on case reviews. The following are examples of recommendations from fatality review teams:

Improving Health Care Systems and Services

- Prioritizing regular annual physicals or well check visits for persons of childbearing age
- Ensure all birthing persons have available preconception care (before pregnancy), inter-conception care (between pregnancies), and counseling
- Improve the quality of prenatal care to ensure that care is acceptable, accessible, appropriate, and culturally sensitive
- Improve local provider knowledge of preconception health care issues
- Increasing vaccination rates for all children, persons planning a pregnancy, pregnant, and newly delivered persons
- Foster family support services, including evidence-based home visiting, to improve the social/psychological environment for birthing persons and families at risk
- Encourage all local providers' comprehensive assessment of and provision of services for risks due to substance use disorders, alcohol, smoking, intimate partner violence, depression, social support, housing, employment, transportation, etc.
- Eliminating barriers to adequate nutrition for birthing persons, education, and access to folic acid
- Equip birthing persons to manage chronic conditions like diabetes and obesity
- Normalizing exploration of family health history
- Investing in trauma-informed smoking and alcohol cessation
- Streamlining referral processes
- Developing resource lists for families
- Advocating for parental, medical, and bereavement leave in the workplace
- Standardizing bereavement support referrals

Bereavement Care

Bereavement care should be individualized to recognize bereaved parents' personal, cultural, and religious needs. Parents should be offered the opportunity to see, hold, name, and photograph the baby without practitioners influencing parent's choices.

Other components of bereavement care after a stillbirth include good communication; shared decision making; recognition of parenthood; acknowledgment of parents', partners', and families' grief; acknowledgment that grief is individual; awareness of burials, cremation, and funerals; ongoing emotional and practical support; health professionals trained in bereavement care; and health professionals with access to self-care.

Conclusions

By counting the number of stillbirths, gathering information on where and why these deaths occurred, and also trying to understand the underlying contributing causes and avoidable factors, healthcare providers, program managers, administrators, and policymakers can help to prevent future deaths and grief for parents, and improve the quality of care provided throughout the health system. This guide shows the way for fatality review teams to equip systems and communities to address the burden of stillbirths and use the information collected to implement the changes within a continuous evaluation and response cycle.

> **"Every time a death is reviewed it has the potential to tell a story about what could have been done to save a mother and her baby."**
>
> **— Dr Anthony Costello, Director of Maternal, Child and Adolescent Health at the World Health Organization (WHO)**

The National Center welcomes inquiries related to stillbirth case reviews at info@ncfrp.org.

Resources

- Centers for Disease Control and Prevention (CDC): https://www.cdc.gov/ncbddd/stillbirth/index.html
- Society for Maternal Fetal Medicine (SMFM): https://www.smfm.org/publications/322-acog-smfm-occ-10-management-of-stillbirth
- The American College of Obstetricians and Gynecologists (ACOG): https://www.acog.org/clinical/clinical-guidance/obstetric-care-consensus/articles/2020/03/management-of-stillbirth
- The World Health Organization (WHO): https://www.who.int/health-topics/stillbirth#tab=tab_1
- Star Legacy Foundation: https://starlegacyfoundation.org/
- Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD): https://www.nichd.nih.gov/health/topics/stillbirth/resources/patients
- International Stillbirth Alliance: https://www.stillbirthalliance.org/
- Healthy Birth Day: https://healthybirthday.org/
- Pregnancy Loss and Infant Death Alliance: https://www.plida.org/
- March of Dimes: https://www.marchofdimes.org/complications/stillbirth.aspx

Endnotes

1 Hoyert DL, Gregory ECW. Cause of fetal death: Data from the fetal death report, 2014. National vital statistics reports; vol 65 no 7. Hyattsville, MD: National Center for Health Statistics. 2016

2 MacDorman MF, Gregory EC. Fetal and perinatal mortality: United States, 2013. Natl Vital Stat Rep 2015; 64: 1– 24.

3 Pruitt SM, Hoyert DL, Anderson KN, et al. Racial and Ethnic Disparities in Fetal Deaths — United States, 2015–2017. MMWR Morb Mortal Wkly Rep 2020;69:1277–1282.

4 The Stillbirth Collaborative Research Network Writing Group. (2011). Causes of death among stillbirths. *Journal of the American Medical Association*, 306(22), 2459–2468.

5 American College of Obstetricians and Gynecologists; Society for Maternal-Fetal Medicine in collaboration with, Metz TD, Berry RS, Fretts RC, Reddy UM, Turrentine MA. Obstetric Care Consensus #10: Management of Stillbirth

6 ACOG Practice bulletin no. 134: fetal growth restriction. Obstet Gynecol. 2013 May;121(5):1122-33.

7 Korteweg FJ, Bouman K, Erwich JJ, et al. Cytogenetic analysis after evaluation of 750 fetal deaths: proposal for diagnostic workup. Obstet/Gynecol 2008;111:865–74.

8 The Stillbirth Collaborative Research Network Writing Group. (2011). Causes of death among stillbirths. *Journal of the American Medical Association*, 306(22), 2459–2468.

9 Villar J, et.al.: Maternal and Neonatal Morbidity and Mortality Among Pregnant Women With and Without COVID-19 Infection: The INTERCOVID Multinational Cohort Study. *JAMA Pediatr* 2021; 175: 817– 826.

10 Escañuela Sánchez T, Meaney S, O'Donoghue K. Modifiable risk factors for stillbirth: a literature review. Midwifery. 2019 Dec;79:102539. doi: 10.1016/j.midw.2019.102539. Epub 2019 Sep 24. PMID: 31585399.

11 Marufu, T.C., Ahankari, A., Coleman, T. et al. Maternal smoking and the risk of stillbirth: systematic review and meta-analysis. *BMC Public Health* 15, 239 (2015). https://doi.org/10.1186/s12889-015-1552-5

12 Leonardi-Bee J, Britton J, Venn A. Secondhand smoke and adverse fetal outcomes in nonsmoking pregnant women: a meta-analysis. Pediatrics. 2011 Apr;127(4):734-41. doi: 10.1542/peds.2010-3041. Epub 2011 Mar 7. PMID: 21382949.

13 NIDA. 2022, May 4. Substance Use While Pregnant and Breastfeeding. Retrieved from https://nida.nih.gov/publications/research-reports/substance-use-in-women/substance-use-while-pregnant-breastfeeding on 2022, May 6

14 Pastore LM, Hertz-Picciotto I, Beaumont JJ. Risk of stillbirth from medications, illnesses and medical procedures. Paediatr Perinat Epidemiol. 1999 Oct;13(4):421-30. doi: 10.1046/j.1365-3016.1999.00196.x. PMID: 10563361.

15 O'Leary C, Jacoby P, D'Antoine H, et al. : Heavy prenatal alcohol exposure and increased risk of stillbirth. BJOG. 2012;119(8):945–952. 10.1111/j.1471-0528.2012.03333.x

16 Yao R, Park BY, Foster SE, Caughey AB. The association between gestational weight gain and risk of stillbirth: a population-based cohort study. Ann Epidemiol 2017;27:638–44.e1.

17 Cronin, R.S., Li, M, Thompson, J, Gordan, A., et al. An Individual Participant Data Meta-analysis of Maternal Going-to-Sleep Position, Interactions with Fetal Vulnerability, and the Risk of Late Stillbirth. The Lancet, Volume 10, P49 – 57, April 01, 2019.

18 Khatib N., Weiner Z., Beloosesky R., Vitner D., Thaler I. The effect of maternal supine position on umbilical and cerebral blood flow indices. *Eur J Obstet Gynecol Reprod Biol*. 2014; 175: 112-114

19 Alhusen JL, Bower KM, Epstein E, Sharps P. Racial discrimination and adverse birth outcomes: an integrative review. J Midwifery Womens Health 2016;61:707–20.

20 *Stressful life events may increase stillbirth risk, NIH network study finds*. March 27, 2013. National Institutes of Health. Stressful life events may increase stillbirth risk, NIH network study finds | National Institutes of Health (NIH)

21 MacDorman MF, Gregory EC. Fetal and perinatal mortality: United States, 2013. Natl Vital Stat Rep 2015; 64: 1– 24.

22 Bell R, Glinianaia SV, Rankin J, Wright C, Pearce MS, Parker L. Changing patterns of perinatal death, 1982-2000: a retrospective cohort study. Arch Dis Child Fetal Neonatal Ed 2004; 89: F531– 6.

23 Fretts RC, Schmittdiel J, McLean FH, Usher RH, Goldman MB. Increased maternal age and the risk of fetal death. N Engl J Med 1995; 333: 953– 7.

24 Browne K, Park BY, Goetzinger KR, Caughey AB, Yao R. The joint effects of obesity and pregestational diabetes on the risk of stillbirth. J Matern Fetal Neonatal Med 2019. DOI: 10.1080/14767058.2019.1607287.

25 Jackson RA, Gibson KA, Wu YW, Croughan MS. Perinatal outcomes in singletons following in vitro fertilization: a meta-analysis. Obstet Gynecol 2004; 103: 551– 63. (Meta-Analysis)

26 Cotzias, C. S., Paterson-Brown, S., & Fisk, N. M. (1999). Prospective risk of unexplained stillbirth in singleton pregnancies at term: population based analysis. BMJ (*Clinical research ed.*), 319(7205), 287–288. https://doi.org/10.1136/bmj.319.7205.287

27 Rowland Hogue CJ, Silver RM. Racial and ethnic disparities in United States: stillbirth rates: trends, risk factors, and research needs. Semin Perinatol 2011;35:221–33

28 Metz, TD, Berry, RS, Fretts, RC, Reddy, UM, and Turremtine, MA. Management of Stillbirth, Obstetric Care Consensus, number 10, March 2020. https://www.acog.org/clinical/clinical-guidance/obstetric-care-consensus/articles/2020/03/management-of-stillbirth

29 Page JM, Christiansen-Lindquist L, Thorsten V, Parker CB, Reddy UM, Dudley DJ, et al. Diagnostic tests for evaluation of stillbirth: results from the Stillbirth Collaborative Research Network. Obstet Gynecol 2017; 129: 699– 706.

30 Korteweg FJ, Erwich JJ, Timmer A, van der Meer J, Ravise JM, Veeger NJ, et al. Evaluation of 1025 fetal deaths: proposed diagnostic workup. Am J Obstet Gynecol 2012; 206: 3.e1– 12.

31 Maslovich MM, Burke LM. Intrauterine Fetal Demise. [Updated 2021 Nov 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; Jan. 2022

32 Flenady V, Ellwood D, Bradford B, Coory M, Middleton P, Gardener G, et al. Beyond the headlines: fetal movement awareness is an important stillbirth prevention strategy. Women Birth 2019; 32: 1–2.

33 Ota E, da Silva Lopes K, Middleton P, Flenady V, Wariki WMV, Rahman MO, Tobe-Gai R, Mori R. Antenatal interventions for preventing stillbirth, fetal loss and perinatal death: an overview of Cochrane systematic reviews. Cochrane Database of Systematic Reviews 2020, Issue 12. Art. No.: CD009599. DOI: 10.1002/14651858.CD009599.pub2

NATIONAL CFRP

Center for Fatality Review & Prevention