Strategies to Reduce Pregnancy-Related Deaths

From Identification and Review to Action


Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

American College of Obstetricians and Gynecologists

American College of Nurse-Midwives

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Contents

Appendices

Prologue

Why Surveillance Still Matters

Each year in the United States, almost 1,000 women die of pregnancy-related complications.[1] Although the number of such deaths has decreased dramatically since the late 19th and early 20th centuries, there has been no decrease in the maternal mortality ratio during the last 15 years.[2,3] On a population level, this number may appear small; however, on the individual level, each death is a heartbreaking loss.

Behind each number is a human face.

—William Foege, M.D.

Because each pregnancy-related death is a sentinel event, every death counts and every death should be counted. Many of these deaths could have been prevented through changes in the health and behaviors of women before pregnancy, the timing of conception, access to heath care and social services, or the quality of care received. Every death prevented is meaningful. Improved surveillance is needed to help develop interventions to reduce pregnancy-related deaths.

The major causes of pregnancy-related deaths are the same today as in the past: bleeding, hypertensive disorders of pregnancy, embolism, and infection.[1] These can pose a threat to any pregnant woman. Yet not all women with these conditions die. Why do some women survive while others do not? Moreover, some groups of women are at increased risk for pregnancy-related death. For example, although most women who die of pregnancy-related complications are white, black women continue to have a four-times greater risk for pregnancy-related death and Hispanic women a 70% greater risk for death than white women.[1,4,5] The risk of pregnancy-related death also dramatically increases with maternal age. Comprehensive, broad-based surveillance is needed to identify the factors, from before pregnancy through the puerperium, that affect a woman's chance of survival and that place minority and older women at increased risk for pregnancy-related death. With the resources available today, we should be able to eliminate this gap in such an important health outcome.

Pregnancy-related deaths are the tip-of-the-iceberg with regard to complications of pregnancy. For every woman who dies of a pregnancy-related cause, several thousand suffer morbidity

related to pregnancy—before, during, or after delivery. Each year six million women become pregnant, almost four million give birth, and over one million experience pregnancy-related complications. This means that pregnancy-related complications are a significant burden on women, their families, and society in economic, social, and personal terms (Unpublished article: Danel I, Berg CJ, Atrash HK, Johnson CH. The magnitude of maternal morbidity during labor and delivery, United States, 1993-1997.).

Public health surveillance—identifying and reviewing pregnancy-related deaths, analyzing the findings, and taking action—should decrease a woman's risk of mortality due to pregnancy as well as help the many women who suffer pregnancy-related morbidity without dying.

1 Structure of Pregnancy-Related Mortality Surveillance in the United States

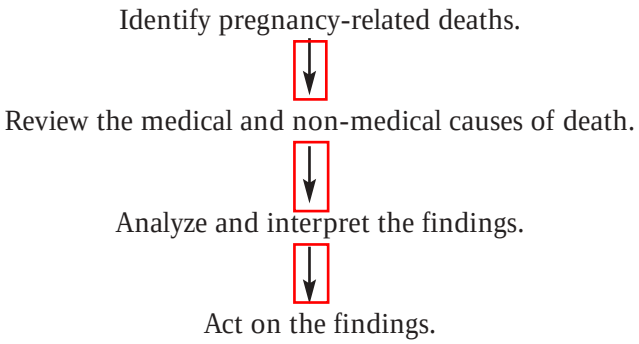
This manual describes strategies for conducting pregnancy-related or maternal mortality surveillance in the United States. This surveillance is an ongoing process of identifying pregnancy-related deaths, reviewing the factors that led to those deaths, analyzing and interpreting the information gathered, and acting on the results so as to reduce such deaths in the future. The ultimate purpose of this surveillance process is to stimulate action rather than merely to count cases and calculate rates or ratios. All these steps—identification, data collection and analysis, and action—are needed on an ongoing basis in order to justify the effort and reduce pregnancy-related deaths.

For pregnancy-related mortality surveillance to be successful, many people from many groups in many different roles must collaborate. In the United States, pregnancy-related mortality surveillance is a public health function, primarily coordinated by the states, although some large counties and cities also undertake this activity. Clinicians and health care professionals play vital roles in many parts of the surveillance process, as do social service and educational agencies, professional organizations, community groups, and the health care industry. Federal agencies assist in coordinating surveillance activities, providing technical assistance, and compiling national data.

This manual addresses issues and tasks that are important for health departments, clinicians, vital statistics personnel, pregnancy-related mortality review committees, legislators, and community groups.

Pregnancy-related mortality surveillance consists of several steps that occur in a more or less sequential fashion. Although each

state has its own unique structure, in every state, pregnancy-related mortality surveillance requires similar steps:



The concept of pregnancy mortality surveillance as an ongoing process with the ultimate purpose of action is an important one. Too often surveillance stops after identifying and counting deaths. However, pregnancy-related mortality surveillance requires all four steps—identification, investigation, analysis, and action—in a continuing fashion to make the effort worthwhile.

The following chapters will address these steps in detail. However, first we provide an overview of the process and the role of the various agencies and health care providers. Pregnancy-related mortality surveillance is usually coordinated by the state health department, frequently by the unit responsible for maternal and child health.

Identification

Finding as many pregnancy-related deaths as possible is important. Women die at home, in clinics, or in hospitals. They die during pregnancy, while giving birth, or after delivery; they die of complications from childbirth, abortion, or ectopic pregnancy. To have a representative picture of the determinants of maternal death, one needs to have as complete a picture of the women who died as possible. Women who die at home may be different from women who die in referral hospitals. Women who die on labor or delivery wards may have different stories from women who die on gynecology wards or emergency rooms. Possible or known pregnancy-related deaths are usually identified by the vital statistics office, although other methods such as computerized data systems and reports from health care providers or surveys may also be used.

Review

Reviewing data on pregnancy-related deaths is the next step. Information on the medical and non-medical factors that led to the deaths is collected, by the state, a review committee, or an individual or group assigned the task. A pregnancy-related mortality review committee then meets to review and discuss the deaths. Members of these committees come from health departments, clinical medicine, other appropriate agencies and professional organizations, the health care industry, and community groups.

Analysis and interpretation

The information collected during the review must be analyzed if it is to be used to reduce maternal deaths. Each case should be individually assessed for the medical and non-medical factors that led to the death, especially the factors that were preventable. The deaths can then be considered as a group in order to find patterns or similar factors. This can be done both quantitatively (i.e., determining whether certain groups of women are more likely to die) and qualitatively (i.e., determining which scenario led to each death).

Action—the reason for all the previous work

The details of this step depend on the findings of the analysis. Action may include interventions in the community, in the schools, by the health care sector, or by local or state agencies. It is important that people with the ability to make changes are involved in the surveillance process, so that they understand the findings and are ready to act.

Once action is taken, it must be evaluated to see if it was effective. The surveillance process then continues with identification and review of deaths in order to modify and refine the actions needed to make pregnancy safer for women.

2 Definition of Terms

Before we can discuss surveillance of pregnancy-related deaths, we must discuss and define our terms. Clear definitions are particularly necessary because of the variety of definitions and terms used by different groups when they discuss mortality related to pregnancy (Box 1).

If we are to understand clearly what is being measured, monitor trends consistently, and compare similar events, terms must be well-defined and understood by everyone involved in the surveillance activities. The World Health Organization (WHO), in collaboration with the official vital registration groups from the member countries, periodically develops and publishes a revision of the *International Classification of Diseases*,[6] which is used throughout the world to classify causes of death. The term traditionally used, including in the United States, to describe deaths caused by pregnancy is *maternal mortality*, defined in the *International Classification of Diseases Ninth Revision (ICD-9)*[6] as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes." This definition is used by the Centers for Disease Control and Prevention's (CDC's) National Center for Health Statistics[7] in its calculations of, and official publications on, maternal mortality statistics for the United States.

In 1986, the American College of Obstetricians and Gynecologists (ACOG)/CDC Maternal Mortality Study Group developed new terms, to expand those in ICD-9 (Table 1).

These terms are—

- **Pregnancy-associated death.** The death of a woman while pregnant or within 1 year of termination of pregnancy, *irrespective of cause.*
- **Pregnancy-related death.** The death of a woman while pregnant or within 1 year of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by her pregnancy or its management, but not from accidental or incidental causes.

Two sets of terms*

Having two sets of definitions and terms can be confusing. However, each set has a different purpose.

ICD terms

- Used by many nations, so they require coding conventions to be applied in a comparable fashion.
- Used to monitor trends and make comparisons.
- Only cause-of-death data from death certificates can be used to identify deaths that meet ICD definitions.

ACOG/CDC terms

- Used by individual states or cities.
- Used to identify deaths for review and action.
- A variety of data sources, including vital records and hospital data, can be used to identify deaths that meet ACOG/CDC definitions.

* See Table 1 for definitions of ICD and ACOG/CDC terms.

Box 1

- **Not-pregnancy-related death.** The death of a woman while pregnant or within 1 year of termination of pregnancy, due to a cause unrelated to pregnancy (Figure 1).

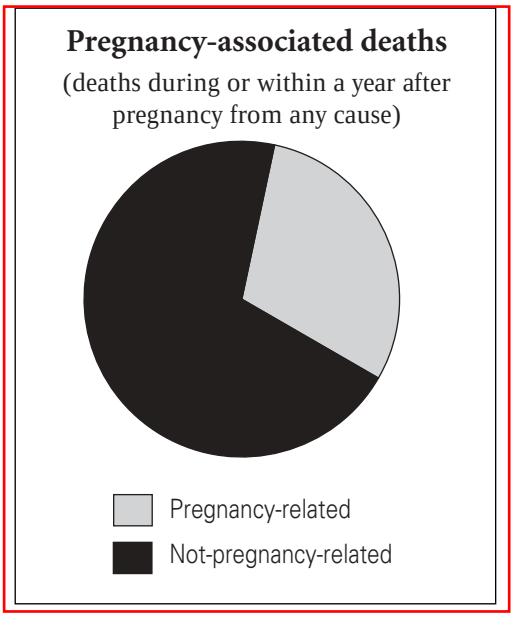


Figure 1

These terms improve surveillance in several ways:

- They help identify deaths caused by pregnancy by promoting the idea of first identifying deaths with a temporal relationship to pregnancy (pregnancy-associated deaths) as a group from which to find those deaths caused by pregnancy (pregnancy-related deaths).
- Including deaths caused by pregnancy but which occurred more than 42 days after pregnancy ended (increasingly common with improved medical care) gives a more complete picture of the effect of pregnancy on mortality.
- Since pregnancy is usually a time when women are in close contact with the health care system, some regard all pregnancy-associated deaths as ones that the health care system—especially professionals involved in prenatal care—should have an interest in and could have an effect on.

ICD-10,[8] which was published in 1992, has been used in the United States to code deaths since 2000 (beginning with 1999 data). ICD-10 kept the term *maternal mortality* and added two new terms (Table 1). The first new term is *late maternal death*, which refers to deaths caused by pregnancy that occurred from 43 days to 1 year postpartum. The second new term added is *pregnancy-related death*: ICD-10 uses *pregnancy-related* to refer to deaths from any cause during or within 42 days of pregnancy; however, according to the ACOG/CDC definitions, these deaths are pregnancy-*associated* deaths that occurred during or within 42 days after pregnancy.

Definitions of death in relation to pregnancy*

	Source of definition		
	ACOG/CDC†	**ICD-9‡**	**ICD-10§**
When death and pregnancy *are* causally related:			
■ Death during pregnancy or within 42 days postpartum.	Pregnancy-related death	Maternal death	Maternal death
■ Death 43–365 days postpartum.	Pregnancy-related death	Not defined	Late maternal death
When death and pregnancy are *not* causally related:			
■ Death during pregnancy or within 365 days postpartum.	Not pregnancy-related death	Not defined	Not defined
When death and pregnancy *may* or *may not* be causally related:			
■ Death during pregnancy or within 42 days postpartum.	Pregnancy-associated death	Not defined	Pregnancy-related death
■ Death 43–365 days postpartum.	Pregnancy-associated death	Not defined	Not defined

* Adapted from Atrash et al.[9]
† American College of Obstetricians and Gynecologists/Centers for Disease Control Maternal Mortality Study Group.
‡ WHO 1997.[6]
§ WHO 1992.[8]

Table 1

Similar terms with different meanings cause confusion. In this manual, we will use the ACOG/CDC Maternal Mortality Study Group terms, as defined on page 5 (see also Table 1).

3 Classifying a Woman's Death in Relation to Pregnancy

The first step in identifying pregnancy-related deaths is to find all pregnancy-*associated* deaths (deaths that occurred during or within a year after pregnancy) to establish the pool from which to identify pregnancy-*related* deaths. Next categorize pregnancy-associated deaths into those that are pregnancy-related and those that are not pregnancy-related. To decide whether a woman's death is pregnancy-related, ask this question:

> ***If she had not been pregnant, would she have died?***

In most cases, the answer is straightforward.

Pregnancy-related deaths are caused by one of the following:

- Complications of the pregnancy itself.
- A chain of events initiated by the pregnancy.
- The aggravation of an unrelated condition or event by the physiologic effects of pregnancy.

Each death must be considered individually. To determine if a woman would have died if she had not been pregnant, look at the cause, the pathologic process leading to the death, and the timing of the death with respect to pregnancy. The experience of states shows that the classification of most deaths is clear. In most cases, an experienced clinician can review the death certificate and any associated birth or fetal death certificate and determine if the death was pregnancy-related or not. In a few cases, determining the relationship to pregnancy requires additional information (see "Other sources of information," page 21) and expert knowledge of the medical and non-medical factors surrounding the death.

The following three questions are helpful for determining the causal relationship between pregnancy and death:

- Is the condition or procedure that caused death unique to pregnancy?
- Is the condition that caused death more likely to occur during or to be exacerbated by pregnancy?
- What is the temporal relationship between the pregnancy, the condition, and death?

Each question is discussed in detail below:

1. **Is the condition or procedure that caused death unique to pregnancy?**
   Deaths caused by conditions and procedures *unique* to pregnancy are, by definition, causally related to pregnancy and should therefore be classified as pregnancy-related. Examples of such conditions are hypertensive disorders of pregnancy, including preeclampsia and eclampsia; hyperemesis; amniotic fluid embolism; and placental conditions such as placenta previa, placenta abruption, and retained placenta. Likewise, deaths from complications of ectopic or molar pregnancy, abortion, or cesarean delivery are pregnancy-related.

   For deaths due to conditions that are *not unique* to pregnancy, the next questions need to be asked to establish if the condition that caused death is one that is affected by pregnancy and if the timing of the condition, pregnancy, and death indicate causality.

2. **Is the condition that caused death more likely to occur during or to be exacerbated by pregnancy?**
   Some conditions are more common, worsen, or are more serious when a woman is pregnant or postpartum. Examples include many types of cardiac disease; hypertension; hematologic conditions (especially sickle cell disease, sickle-C, and sickle-beta thalassemia disease); immune thrombocytopenic purpura (ITP); diabetes mellitus; intracranial hemorrhage; pneumonia; bacterial infections; varicella; urinary tract infections; cirrhosis; gall bladder disease; systemic lupus erythematosus; and ulcerative colitis. In cases of deaths from these conditions during or after pregnancy, answer question 3 to determine if the death is pregnancy-related.

For other medical conditions, such as epilepsy and asthma, the effect of pregnancy is variable. Pregnancy may exacerbate the condition in some women, have no effect in others, and actually improve the condition in still other women. This makes determining the causal effect of pregnancy on a death more complex.

For still other conditions, pregnancy does not appear to affect the risk of mortality: for example, cancer, HIV/AIDS, chronic glomerulonephritis (unless there is severe superimposed preeclampsia or abruptio placentae), sarcoidosis (unless there is extensive pulmonary involvement), and acute viral hepatitis (except for hepatitis E).

3. **What is the temporal relationship between the pregnancy, the condition, and death?**
When evaluating the causal relationship between a condition and pregnancy, consider the temporal relationship between events, including both the absolute amount of time elapsed between pregnancy and death as well as the sequence and timing of the events leading to death.

The anatomic and physiologic effects of pregnancy vary by period of gestation and amount of time elapsed since delivery. The traditional definition of a maternal death as one that occurs during or within 42 days of delivery can be a helpful starting point in many cases. Although the relationship between pregnancy and the function of organ systems has not been exhaustively studied, most experts believe that the effects of pregnancy on many systems (e.g., the cardiac system) have resolved by 6 weeks postpartum (i.e., these systems have returned to their prepregnancy state). The anatomic effects of pregnancy on the lungs begin to resolve as soon as the uterus is emptied, although effects from surgery and anesthesia may last longer. Therefore, a death from pneumonia or epilepsy that occurs the day after delivery would be considered pregnancy-related; deaths from those conditions 6 or 11 months after delivery would not if the woman had otherwise been well during the intervening time.

It is possible for a pathologic process to begin during pregnancy or the puerperium and continue for months, ultimately leading to death. Therefore, it is important to establish whether a condition that began during pregnancy or the postpartum period became progressively worse, or whether the woman recovered but later developed a recurrence after the effects of pregnancy were gone. For

example, during pregnancy a woman with systemic lupus erythematosus may develop renal failure with an unremitting course that ends in death months after delivery. However, she may also give birth, have no sequelae from the pregnancy and—months later—develop a complication of lupus and die. The first example is pregnancy-related, and the second is not pregnancy-related. Similarly, a woman may develop a condition such as adult respiratory distress syndrome (ARDS) after a hemorrhage and be on a ventilator for months before dying of pneumonia. Women who have severe complications from anesthesia and who are in a coma may die months after the actual procedure; however, if the causal chain of events began with the pregnancy, the death is pregnancy-related.

Cases where causal relationship may be unclear

Determining the causal relationship between pregnancy and death is usually straightforward, although for some causes of death the relationship to pregnancy may be more difficult to determine. In such situations, it is important to have experts in a variety of areas on the review committee to help evaluate such cases.

- ***Deaths from infection***
  The contribution of pregnancy to a death from infection, particularly during the postpartum period, can be difficult to determine. Scientific data are unclear about the effect of pregnancy on the immune system. Although overall immune function during pregnancy is largely intact, there is some evidence of decreased cell-mediated immunity and of increased susceptibility to, and severity of, some infections. These include influenza[10] and varicella. Most researchers find that pregnancy does not increase the likelihood of dying for women with HIV.[11] Even if they occur during or within a year after pregnancy, deaths that would have occurred even without pregnancy, such as those from HIV, are not pregnancy-related because there is no causal relationship.

- ***Deaths from injuries***
  All women are at risk of death from injuries, both intentional and unintentional. Indeed injuries are the major cause of death for women of reproductive age.[12] Deaths from injuries that occur during pregnancy or in the postpartum period may be pregnancy-related or not pregnancy-related. Severe

Three case studies

A. A 20-year-old female G2P1 with sickle cell anemia has an acute sickle crisis at 28 weeks gestation and dies on the second postpartum day.

   Is this death causally related to pregnancy?

   Yes.

B. A 20-year-old female G2P1 with sickle cell anemia has an acute sickle crisis at 28 weeks gestation and suffers a cardio-respiratory arrest during delivery. She is resuscitated and placed on life support. She survives for 4 months but eventually becomes septic and dies.

   Is this death causally related to pregnancy?

   Yes.

C. A 20-year-old female G2P1 with sickle cell anemia gives birth to a healthy baby girl at 37 weeks gestation. Eight months later she develops an acute sickle crisis and dies.

   Is this death causally related to pregnancy?

   No.

postpartum depression, which affects about 1–2 per 1,000 women after childbirth,[13] may lead to suicide; such a death would obviously be pregnancy-related. Homicide may or may not be causally related to pregnancy, depending on the circumstances of the death. The prevalence of intimate partner violence against pregnant women does not appear to be higher than that against nonpregnant women;[14] overall, the mortality rate due to homicide is not elevated in the postpartum period.[15,16] Pregnancy-associated deaths due to homicide need to be reviewed for a possible causal relationship to pregnancy, just as deaths due to other causes not unique to pregnancy need such a review. These reviews will almost always require information beyond that found in vital records.

Motor vehicle-related injuries are a significant cause of death for all women of reproductive age: nonpregnant, pregnant, and postpartum. In some cases, the causal relationship with pregnancy is clear (e.g., amniotic fluid embolus or abruptio placentae resulting from a motor vehicle-related injury). In other cases, anatomic or physiologic changes caused by pregnancy may have made a woman more prone to injury and resultant death. For example, a woman who normally wears a seat belt may not do so when pregnant She may be misinformed about the need to do so or not know the proper way to wear it when pregnant, particularly during the last trimester.

However, in many cases, particularly those that occur postpartum, injury-associated deaths may be causally unrelated to pregnancy, especially deaths from motor vehicle-related injuries. One-third of adult Americans do not routinely wear a sear belt,[17] and the decision by a pregnant woman not to use a seat belt may be unrelated to pregnancy. In addition, several studies indicate that, overall, pregnant and postpartum women may actually have a lower risk than nonpregnant women of death from unintentional injury for reasons that are not yet clear.[15,16] Including injury-related deaths that are not pregnancy-related will falsely increase the pregnancy-related mortality estimate and make comparisons and analysis of trends difficult.

During pregnancy, women are in frequent and close contact with the health care system. Providers should be educated about 1) the possibility of intimate partner violence and the need for appropriate referrals in such cases, and 2) the need to explain the proper use of a seatbelt during pregnancy. Many injury-related deaths are preventable with appropriate interventions.

Injury-related death and pregnancy

Deaths from injuries during pregnancy or the year after pregnancy may be pregnancy-related or not-pregnancy-related. To determine which, answer two questions:

- Was the death the result of "a chain of events initiated by pregnancy"?
- If the woman had not been pregnant, would she have died?

Pregnancy-associated deaths

This manual focuses on pregnancy-related deaths (i.e., deaths that would not have happened if the woman had not been pregnant).
In recent years many groups have become interested in the larger group of pregnancy-associated deaths, about three-quarters of which are not causally related to pregnancy. Because pregnancy is a unique time, usually one with close association between a woman and her health care provider, many researchers believe it should be a key intervention point to reduce other causes of mortality.

4 Identifying Cases

The first challenge in pregnancy mortality surveillance is to find all cases of pregnancy-related death. Pregnancy-related mortality is a clinical definition. Unlike infant mortality rates, which include all infants who die before the age of 1 year, pregnancy-related mortality calculations do not include all pregnant women who die. To determine whether a woman's death is pregnancy-related, one must first know both the temporal and causal relationship between pregnancy and the death.

Several studies show that routine methods of identifying pregnancy-related deaths underestimate the number by one-half to two-thirds.[1,18] Because deaths identified by routine methods may differ from those less easily found, it is important to try to find all pregnancy-related deaths in order to have a complete and accurate picture of the scope of the problem, to monitor trends, and to determine the characteristics of women at risk (see Chapter 6 "Analyzing and Interpreting the Findings").

Currently, no single source of information captures all pregnancy-related deaths, despite all deaths and essentially all live births in the United States being registered by Vital Statistics. Several reasons account for this failure:

- Lack of physician training in, or knowledge about, how to fill out a death certificate.
- ICD coding rules that make the cause-of-death code on a death certificate fall outside the range of conditions considered to be pregnancy-related (in ICD-9, those codes are 630–676; in ICD-10, chapter O).
- Reliance on death certificate data to estimate cause of death.
- Medical records that fail to indicate that the events leading to death began with pregnancy, especially if the death occurred during the postpartum period.
- Medical and autopsy records that cannot be located or are not available for review.

Goal of pregnancy mortality surveillance

The goal of pregnancy mortality surveillance is to find and review deaths caused by pregnancy in order to understand what happened and learn how to decrease such deaths in the future.

Thus, a pregnancy mortality surveillance system tries to identify all deaths caused by pregnancy. This is a related but separate undertaking from identifying deaths at a national level that meet the National Center for Health Statistics (NCHS) criteria for *maternal deaths.* However, as discussed in Chapter 2 "Definition of Terms," each system has a different purpose and use.

To increase case identification, one should start by trying to find all possible pregnancy-*associated* deaths. This establishes a pool from which pregnancy-related deaths can be identified. After establishing the cause of death by reviewing the death certificate and (where necessary) other data, one can then divide the pregnancy-associated deaths into those that are pregnancy-related and those that are not pregnancy-related (Figure 1).

The pregnancy-associated deaths easiest to find are those that occur after the birth of a live infant. This is done by linking computerized death and birth records; some states also link death and fetal death certificates. When death records are linked to birth records, about one-quarter to one-third of the post-delivery deaths identified are found to be pregnancy-related.[15,19]

Each source used for identifying deaths can capture deaths with different characteristics. Each source also requires specific resources, such as personnel, computer time, and legal access to the data. Some of the states most successful at identifying pregnancy-related deaths have been those with active maternal mortality review committees that encourage clinicians to report such deaths to the committee or its chair. Sources of pregnancy-related deaths are listed below in order of simplicity and convenience:

- Death certificate cause-of-death codes—the *core* source for finding cases.
- Manual review of death certificates.
- Pregnancy check boxes on death certificates.
- Computerized linkages of vital records.
- Other computerized data sources.
- Obstetricians, other clinicians, and groups.
- The news media.
- Autopsy and medical records.

Using multiple sources of information

We strongly recommend using multiple sources of information to identify deaths. However, reviewing records (e.g., medical and autopsy records of all deaths of women of reproductive age) for *case identification* is labor intensive and not feasible for routine use. Such a method is used to identify cases *only for special projects.*

On the other hand, for the *review process*, obtaining and reviewing records of already-identified pregnancy-related deaths is *necessary* for verifying the cause of death and understanding the medical events that led to the death.

Cause-of-death codes on death certificates

Vital records are always the first source of pregnancy-related deaths. Part I of the cause-of-death section on the death certificate has four lines on which the immediate and underlying causes of death are recorded (Figure 2).

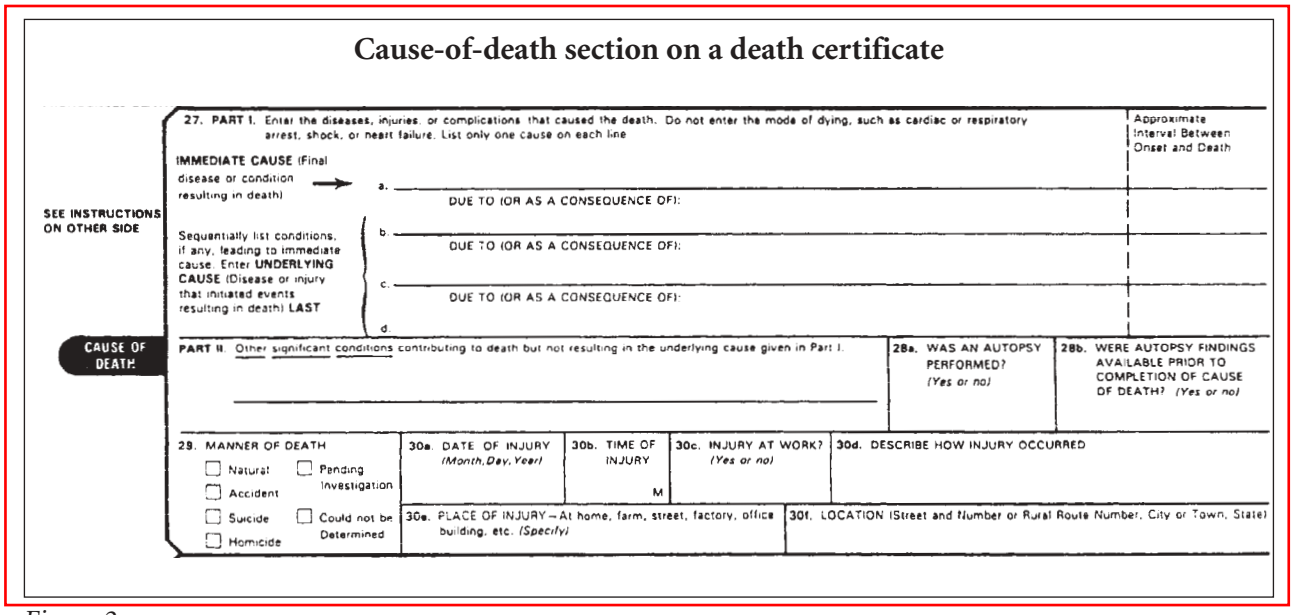


Figure 2

In ICD-9, the codes for the conditions leading to maternal deaths are 630 through 676.9. However, relying solely on these codes identified only about one-third of pregnancy-related deaths.[18] In addition, ICD-9 codes pertaining to maternal death could be used only when the death occurred during pregnancy or within 42 days postpartum. Therefore, deaths that occurred 43 through 365 days postpartum were not coded in this range. However, the percentage of pregnancy-related deaths that occur more than 42 days postpartum is only between 5% and 10% of all pregnancy-related deaths.[1] Therefore, failure to identify pregnancy-related deaths occurring more than 42 days postpartum is not the major reason for the under-ascertainment of pregnancy-related deaths when vital records are used as the only data source.

ICD-10 has a single cause-of-death code for late maternal death. Deaths that are caused by a complication of pregnancy and occur from 43 through 365 days after the end of pregnancy

receive this code as the immediate cause of death. Thus, all late maternal deaths are recorded as having the same immediate cause, regardless of the pathologic process that led to the death. To identify the underlying causes of death when using the national vital statistics mortality tapes, the multiple cause-of-death files must be used. However, using the maternal and late maternal death codes will identify the pregnancy-related deaths.

How clinicians record causes of death on death certificates can sometimes lead to deaths not being identified as pregnancy-related. Clinicians may not indicate that pregnancy was a factor in the death; for example, death might occur after a long series of complications, and the role of pregnancy in initiating the causal pathway is lost or forgotten. In other cases, clinicians might use general terms, such as hemorrhage or sepsis, and not specify the uniqueness and relationship to pregnancy, such as ectopic pregnancy or chorioamnionitis (Box 2).

There are also specific rules governing coding of causes of death that may leave the coder (nosologist) unable to assign a code that indicates a relationship to pregnancy. Unfortunately, physicians are rarely trained in these rules or in the correct way to complete vital records (Box 2). "Instructions for Completing the Cause-of-Death Section of the Death Certificate," a two-page guide published by NCHS, provides help for this important activity. The document is available on the Internet at http://www.cdc.gov/nchs/about/major/dvs/handbk.htm or laminated copies may be obtained by calling NCHS at 301-458-4636 (Appendix A).

Manual review of death certificates

Because of issues surrounding the reliance on computerized cause-of-death codes discussed above, manual review of death certificates is strongly recommended. Manual review of death certificates of women of reproductive age allows the reviewer to read notes in the margin, which may be the only indication that the woman was pregnant or postpartum (Box 2). Manual review is also helpful for finding pregnancy-related deaths when coding conventions were not followed by the certifier, such as when more than one condition is listed on a line (Box 2) or when pregnancy key words are not indicated in Part I of the cause-of-death section on the death certificate.

Cause-of-death codes are not always reliable

Discovered during a manual review of death certificates was one certificate that listed the cause of death and the ICD-9 codes as follows: cardiorespiratory arrest (427.5) secondary to hypovolemic shock (785.59) secondary to hemorrhage (459). This death would not be classified as a maternal death on the basis of ICD-9 codes. However, uncoded but written in the margin of the certificate was the following: "ruptured right tubal pregnancy."

A clinician certifying a death wrote "Cardiorespiratory arrest secondary to amniotic fluid embolus" across the first cause-of-death line on the death certificate. Because coders are allowed to code only the first item on the line, the amniotic fluid embolus could not be indicated as the cause of death.

In the space denoting the time between the onset of a condition and death (Figure 2), a clinician indicated death as having occurred 6 months *after* pregnancy, although the death actually occurred *during the 6th month of pregnancy*. Therefore, a pregnancy code was not assigned as the cause of death.

Box 2

However, even a careful review of death certificates cannot ascertain all cases. The certifier may focus on specific diagnoses or may fail to indicate a relationship to pregnancy because the events surrounding the actual death were so complex that events earlier in the causal chain are not mentioned. In other instances, pregnancy may not be documented because the family or clinician did not wish to indicate the woman's pregnancy status. Some deaths that occur early in pregnancy may not be identified as pregnancy-related because the woman, her family, or her health care providers were unaware of the pregnancy.

Check box indicating pregnancy on death certificates

A 1998 review found that death certificates for 16 states and New York City had check boxes or specific questions asking the certifier whether decedent had been pregnant within a specific period prior to death[19] (Appendix B). Having a check box to indicate pregnancy on the death certificate improves identification of pregnancy-associated deaths (Table 2). However, determining the causal relationship between the death and pregnancy may require review of additional information. In some instances, a check box does not help in identifying pregnancy-associated deaths; for example, sometimes the certifier neglects to mark the check box; other times, the check box is marked when the decedent was not pregnant (e.g., on a man's death certificate).

Effect of pregnancy check-box on death certificates on the identification of pregnancy-related deaths

	Number of deaths		Maternal mortality ratio		
	Code only	Code and box	Code only	Code and box	Percentage increase
Puerto Rico 1989	13	22	19.5	33	69
Texas 1991	27	58			115

Table 2

The time between death and pregnancy indicated by the check box varies from state to state: 42 days, 90 days, 6 months, 1 year, or 18 months. Under ICD-9, if the time indicated by the check box is greater than 42 days—the cut-off for maternal death under ICD-9—the check box indication of pregnancy cannot be taken into account in assigning a cause-of-death code.

The United States is in the process of revising its Standard Certificate of Death, which will include a series of check boxes for pregnancy (Appendix C). The intervals between pregnancy and death will be consistent with the ICD-10 maternal mortality definitions put into use in 2000. The standard certificate, which will serve as a model for the states when they develop new death certificates, is now being reviewed. It is anticipated that the new standard certificate will be in use by the states in 2003 or 2004. This change could greatly increase the use of a pregnancy check box and also alleviate the confusion over the use of different intervals between pregnancy and death.

Linking vital records

Death certificates for reproductive-aged women who die can be linked with certificates of reportable pregnancy outcomes (live births and fetal deaths) that occurred during the preceding year. Although many states require that induced abortions be reported, only one includes on its records identifying data that could be used to link those records with other computerized records. Linking data sets is being done in an increasing number of states, and published reports indicate that such links can increase case ascertainment by 36% to 153% (Table 3, Box 3). However, linking vital records cannot ensure that all pregnancy-related deaths will be identified, since only about two-thirds to three-quarters of pregnancy-related deaths are associated with either a live birth or a fetal death. Excluded from linkages would be deaths associated with ectopic pregnancies, induced and some spontaneous abortions, gestational trophoblastic disease, and undelivered pregnancies.

The method used to link vital records (death certificates of women of reproductive age, birth certificates, and fetal death certificates) and to link death certificates with other computerized data bases depends on the data for consistency elements in each data base. Some data sets may contain social security numbers, which should be unique identifiers but are

Effect of linking birth and death certificates

When birth certificates were linked to death certificates for a state-based analysis, the number of identified pregnancy-related deaths due to embolism, infection, cardiomyopathy and other causes increased substantially.

If ICD-9 codes 630–676.9 had been used for the same deaths, 89% of the deaths from hemorrhage would have been found, but 35% to 45% of the deaths due to infection, anesthesia, cardiomyopathy, and other medical conditions would have been missed[20] (see also Table 3).

Box 3

frequently not recorded accurately or are missing.[21,22] Some states may strip identifiers (e.g., name, date of birth, and social security number) off certain data sets or restrict the use of computer files to certain uses or personnel.

Effect of linking vital records on the identification of pregnancy-related deaths

State	Years	Type of records linked*	Number of deaths		Maternal mortality ratio		Percentage increase
			Without linkage	With linkage	Without linkage	With linkage	
Washington	1977-84	LB & FD	34	57	6.8	10.9	68
West Virginia	1985-89	LB	7	16	5.4	12.4	129
North Carolina	1988-89	LB & FD	19	48	9.5	24	153
Georgia	1990-92	LB	56	73	16.8	21.9	30

* Records linked with death certificates of women of reproductive age: LB = live birth; FD = fetal death.

Table 3

States that want to link vital records have two options:

- Use commercially available software specifically designed to link records.
- Create custom software using common computer languages for consistency or data base systems. If simple matching rules are used, the programming is relatively straightforward; for complicated probabilistic linkages, more sophisticated programming would be required.

After the original linkage algorithm and programming are established, the process can be repeated in later years with minimal resources. One state health department statistician estimates that—with its system—linking a year's worth of data takes about 5 hours.

An example of a deterministic scoring system, containing 10 variables, that Tennessee used to link death files with live birth and fetal death files is in Table 4. Exact matches, partial matches, and non-matches each received different scores, which were then added together to determine if two records were a match.

Variables used to link death, birth, and fetal death certificates in a Tennessee study and scores assigned for levels of matching*

Variable	Points credited		
	Exact match	Partial match	Mismatch
Date of birth	5	3	-3
Area of state	0	0	-3
County of residence	0	0	-1
Race	0	0	-3
Current surname	2-8	1-4	-3
Maiden surname	2-8	1-4	-3
First name	2-8	1-4	-2
Address	4	1-3	-1
State of birth	0	0	-1
Marital status	0	0	-1
Reversal of maiden name and surname	0	0	-3
Date of delivery versus date of death	0	0	-4

* A score of 13 points or greater indicated a potential match.[21]

Table 4

Searches of other computerized data sources to identify deaths of women of reproductive age

As more and more medical, program, and administrative data bases are computerized, the ability to identify deaths of women of reproductive age and thus pregnancy-related deaths increases. State-based hospital discharge data can be linked with death certificates or searched for cases with diagnostic or procedure codes that indicate pregnancy and discharge codes that indicate death. Medicaid prenatal care files or WIC files can also be linked with death files, if sufficient data are available. Linking these types of records allows identification of women who died before delivery or whose deaths were associated with other pregnancy outcomes besides live births or fetal deaths. Hospital computerized systems with data on hospital discharges (including vital status at discharge) and reliable information on diagnoses and procedures could be used to screen for pregnancy-related deaths.

Other sources of information

Resourcefulness can uncover numerous other ways to identify pregnancy-related deaths. Here are some suggestions:

- Contact hospital maternal mortality review committees and hospital quality assurance coordinators and request their reports.
- Ask hospitals or labor and delivery services to review any lists of deaths they maintain.
- Send letters periodically to the heads of delivery rooms, emergency departments, police departments, and Emergency Medical Teams.
- Scrutinize newspaper obituaries.
- Scan newspapers for reports of women's deaths.
- Search data bases, such as Lexis Nexis, which has abstracts from hundreds of newspapers and magazines, for information on deaths that may be pregnancy-related.
- Scan medical journals for case reports involving deaths of reproductive-aged women.
- Examine court records and data bases of court records (e.g., those in Lexis Nexis); pregnancy-related deaths may involve a lawsuit, and depositions are in the public record.

Autopsy record review

Reviewing medical examiners' (MEs) and coroners' records and autopsy records is another method of identifying pregnancy-related deaths. Not all women who die are autopsied; however, if available, autopsy records provide an accurate and detailed picture of the cause of death. Since these records are usually not computerized, it is helpful to have a prospective agreement with MEs and coroners that they notify surveillance staff of any deaths of women of reproductive age.

Medical record review

The gold standard for identifying pregnancy-related deaths is the Reproductive Age Mortality Study (RAMOS), which involves reviewing the medical records of physicians, clinics, and hospitals on all women who died from age 10 through 50.

This method should find all pregnancy-related deaths. Such a review in France in 1989 more than doubled the number of maternal deaths found in that country.[18] However, *as a method of case identification*, a RAMOS is used only for special periodic surveys, not for routine surveillance. Once a death is identified as possibly pregnancy-related, medical records provide crucial information on the cause of death, whether it was pregnancy-related, and the medical factors that contributed to the death (see Chapter 5 "Reviewing Pregnancy-Related Deaths").

A less costly "silver" version of a RAMOS could be used to identify pregnancy-related deaths through a review of medical and autopsy records of selected deaths with causes likely to be associated with pregnancy (e.g., deaths from hemorrhage, embolism, or sepsis). Deaths from causes such as motor vehicle-related injuries and cancer would not be reviewed. Computerized records of hospital discharges with information on diagnoses, procedures, and discharge status could be used for this purpose, as well as records of deaths in hospitals with age, sex, and cause of death.

5 Reviewing Pregnancy-Related Deaths

During the early and middle part of the 20th century, most states had maternal mortality review processes. As pregnancy-related mortality decreased and fear of professional liability suits increased during the past few decades, many states disbanded their committees. In the 1990s, however, many states began to reactivate them.

The purpose of reviewing pregnancy-related deaths is to gain insight into the medical and social factors that lead to such events in order to decrease such deaths in the future. In this manual we focus on pregnancy-related mortality review at the state level—although maternal mortality reviews are sometimes conducted by hospital-based peer-review committees that focus strictly on medical events leading to the death (Box 4). The pregnancy-mortality review process needs to include non-medical as well as medical causes underlying the death. Some states take a systems approach to identifying ways of reducing pregnancy-related deaths. This approach includes looking for problems with the health care system as a whole—including the public health system—and not merely at individuals or individual practices.

One useful way to assess systemic problems that contribute to maternal deaths is to look at the barriers women face when they need health care. WHO developed a framework for assessing the situation in developing countries.[23] This framework outlines three barriers to optimal health care:

- The first level occurs when a woman or her family either does not recognize there is a health problem or fails to seek health care when a problem is recognized. Examples of these barriers include 1) a lack of knowledge or understanding of normal pregnancy and the signs and symptoms of pregnancy complications and 2) making a decision not to seek care due to lack of comfort with a health care system perceived as not culturally appropriate.

- The second level of barriers occurs when a woman has difficulty reaching health care once she or her family has decided to seek care. Examples of these types of barriers include affordability issues, problems with transportation, and availability of appointments at local facilities.
- The third level pertains to quality of care and includes problems in receiving timely and appropriate care once health care has been accessed.

Traditionally, maternal death review concentrated on issues at the third level. However, looking at more than just clinical factors reinforces that the purpose of mortality review is not to focus solely on the clinical aspects of care but to find ways to reduce such deaths by actions at all levels of the health care system, including interventions at the community level.

Understanding the medical factors that contribute to each death is accomplished by reviewing medical records and, if appropriate, interviewing health care providers. The non-medical, social, or community factors may be assessed by collecting information from social services records, interviews with care providers, and, where appropriate, people who knew the deceased, such as the woman's partner and family.

Pregnancy mortality review should be anonymous, confidential, and nonjudgmental. The findings should not result in disciplinary action. Reviews of relevant state laws, first done in 1989[24] and updated by ACOG in 2000 (Appendix D), have shown that—in most states—statutes protect the reports, proceedings, and findings of the review committee from being used (discovered or admitted into

Types of review committees

Expert review committees

Function:

To identify the most effective means of reducing morbidity and mortality.

Members:

Usually physicians and other professionals with expertise in the area of health being reviewed.

Features:

- Usually operate at the state level (e.g., as a standing committee of the state medical society that cooperates with the state health department).
- Are not used for disciplinary purposes.
- Do not need to know names of patients or physicians.
- Do not review the qualifications of the health care provider.

Peer review committees

Function:

To evaluate medical treatment to ensure the quality of the care provided.

Members:

Usually physicians, nurses, and administrators.

Features:

- Usually operate at the local level (e.g., at a particular hospital) but sometimes operate at the state level.
- Are often used for disciplinary purposes.
- Review the qualifications of health care providers.
- Results of reviews are often used to enforce improved medical practice and evaluate costs of medical care.

Box 4

evidence) in civil lawsuits. Most states also have laws that grant the participants on expert review panels immunity from liability (see "Legal Issues," page 37).

Maternal mortality review committees

In most cases, the state is the level at which pregnancy-related deaths are reviewed, although the process can occur in some very large cities and counties. The legislation that enables maternal mortality review and the review committee's place within the governmental organization vary widely from state to state. The committees usually operate within state health departments; they frequently work in close collaboration with the state medical society, state obstetric and gynecological society, or the state section of ACOG.

These committees are considered expert review committees with no authority to take disciplinary action or judge the qualifications of health care providers. Many hospitals have peer-review maternal mortality committees that monitor and assess the medical care received by any pregnant woman who dies at their facility. The process of state-based maternal death review described here includes medical and non-medical, social, and economic factors (such as barriers to health care) in addition to health care system issues. Hospital-based review committees usually do not address systems issues that may have contributed to the death; nor do these local reviews provide population-based information.

Steps in a state-based maternal mortality review

1. Establish a multidisciplinary maternal mortality review committee.
2. Agree on procedures, schedule, and logistics for reviewing deaths.
3. Review the state laws on immunity and confidentiality as they relate to review committees.
4. Have all committee members and health department staff sign an agreement of confidentiality before they receive any information on cases.
5. Identify individuals responsible for each activity required for a death review.
6. Arrange to receive notice of deaths from multiple sources, including the state vital statistics office.
7. Collect relevant information from medical records, autopsy reports, social services reports, health care providers, and the families of the deceased women (when appropriate).
8. Review all available information on each case and synthesize information into case summaries for the committee.
9. Remove identifiers from records, and assign a case number.
10. Disseminate de-identified information to committee members before meeting to discuss deaths.
11. Present cases to the full committee for discussion—possibly in consultation with the people involved in the care of the patient—to identify medical, non-medical, and systems problems.
12. Determine whether the death was pregnancy-related or not. Ascertain the medical and non-medical causes of death and any health care systems problems. Determine whether the death was preventable and, if so, how.
13. Recommend steps for preventing similar deaths in the future.
14. Disseminate findings in order to educate medical and non-medical personnel, and recommend the system changes needed to reduce pregnancy-related deaths.
15. Facilitate actions based on the recommendations.

Maternal mortality review should be part of each state's core public health function of assessment. Pregnancy-related death identification and review should be a routine component of the work of the health department and should not depend on a particular individual being interested in such reviews. State maternal mortality review committees make important contributions to public health by improving the identification of pregnancy-related deaths; conducting or overseeing the review of these deaths; recommending actions to help prevent future deaths; and synthesizing and disseminating the review results.

Pregnancy-related death identification and review should be a routine component of the work of the health department and should not depend on a particular individual being interested in such reviews.

State-based review is most appropriate for several reasons. Review should occur at the level at which decisions can be made and resources allocated to reduce pregnancy-related deaths. The National Fetal and Infant Mortality Review program (NFIMR), carried out jointly by ACOG and the Maternal and Child Health Bureau of the Health Resources and Services Administration (HRSA), promotes community-based review of fetal and infant deaths and was a leader in including both medical and non-medical factors in the review.[25] However, because pregnancy-related deaths are relatively uncommon, it is usually more appropriate for states to review pregnancy-related deaths than for cities or communities to do so. States are more likely to have a sufficient number of cases to identify any patterns and to keep the proceedings confidential. In addition, states can more easily disseminate results, make recommendations, and take action to decrease pregnancy-related mortality.

Function

Maternal mortality review committees or their staff are responsible for collecting the materials relevant to each case, preparing the materials for review, and convening meetings to review the findings. The review committees or their staff also facilitate or obtain the cooperation of state medical societies, health departments, and hospitals. Although the procedure may vary, committee meetings usually involve presentation of the case, discussion of the essential components of the case, sometimes consultation with people involved in the care of the patient, and the development of recommendations to improve the health care system.

Members

As the factors to be reviewed expand from the purely medical to include social and other factors, so must the experience and expertise of review committee members be broadened to

reflect the scope of the review. Committee membership should reflect the diversity of the areas being reviewed and provide broad, less traditional insight on maternal death prevention. For example, managers of family planning programs can increase their understanding of which women are at higher risk of maternal death and tailor their programs to prevent pregnancy among women who have high-risk medical conditions and do not wish to become pregnant. Representatives from boards of education may increase their awareness of the risks associated with teenaged pregnancy and develop programs to reduce such pregnancies. Committees may include representatives from various disciplines and organizations:

- Medical specialties, including obstetrics and gynecology, family practice, internal medicine, anesthesiology, neonatology, and pathology.
- Nursing and nurse midwifery.
- State medical societies.
- Public health departments.
- State Title V maternal and child health agencies.
- State Title X family planning programs.
- Social services programs for women, including programs on family planning, women's health, WIC, intimate partner violence, and substance abuse.
- Social work.
- Nutrition.
- Medical examiners and coroners.
- Hospitals, managed care organizations, and other health industry organizations.
- Education boards.
- Clergy and other religious leaders.

Committee members should be selected as official representatives of the leaders of their organizations, rather than as individuals from particular disciplines. The goal of the surveillance process is action, and leadership structures of organizations have greater capacity than individuals to take the needed actions to implement changes in policies and practices. However, it is helpful to have individual members who are knowledgeable about maternal health and interested in trying to reduce pregnancy-related mortality.

Staff requirements

In states with perinatal care regions, some review functions, including medical and non-medical data collection and family and care provider interviews, may be delegated to the staff of the regional perinatal center. Because the number of deaths in each perinatal region is usually relatively small, the amount of work required per region should be small enough to allow it to be integrated into the activities of the existing staff. States may hire health care professionals to abstract case data (i.e., review the records) and write case summaries. In such instances, the abstractor needs to have the experience and expertise to appreciate the critical issues involved in the case. Florida's Department of Health's Pregnancy-Associated Mortality Review (PAMR) estimated that PAMR requires the equivalent of one full-time position divided between three people: a half-time coordinator, a quarter-time data analyst, and a quarter-time clerk. In addition to these designated personnel, Florida pays experienced clinical abstractors a flat fee to review all medical and social services records and to abstract the data, allowing 10 hours per case. (Personal communication, A. Phelps, Florida Department of Health, 2001.)

Cost

The cost of conducting maternal mortality reviews depends on the existing infrastructure, the number of deaths, and the type and amount of information collected. Depending on the location in the health department where the review activity is situated, secretarial support may be needed for such tasks as sending out letters and organizing meetings. Funds will also be needed to abstract medical records and de-identify cases. Travel costs for committee members are handled in different fashions in different states. Some states rely on individuals donating their time and traveling at their own expense; other states reimburse travel costs and provide a per diem. In New Mexico, committee members are not paid but receive Continuing Medical Education (CME) credit for their time at review meetings.

Issues to review

Every review of a pregnancy-related death should consider the range of factors that could have contributed to the death, many of which are interrelated:

Medical (pathologic) cause of death.

Non-medical (social) causes underlying the death.

- Intendedness of pregnancy.
- Woman's and her family's knowledge about pregnancy, the warning signs of complications, and the need for care.
- Timeliness on the part of the woman in recognizing a problem, making decisions, and taking action.
- Accessibility and acceptability of health care (cultural, experience, financial, geographic, transportation, logistic).
- Cultural competence and communication skills of health care providers.
- Woman's adherence or non-adherence to medical advice and health interventions.

Quality and content of medical care.

- Preventive services.
- Community and patient education.
- Nutrition, substance abuse, and social services.
- Preconception services.
- Prenatal care.
- Labor and delivery services.
- Postpartum care and follow-up.
- Treatment and management.
- Diagnostic procedures.
- Medical interventions.
- Patient education and follow-up.

Each state must decide which data items they want to collect. A list of top priority data items should be developed, along with a list of data items of secondary importance, which could be collected if available and if specific plans for their analyses and interpretation are developed.

A tendency in surveillance or data collection systems is to collect too much data without a clear plan for how they will be stored, analyzed, or used for action. As with other health surveillance systems, when identifying core or key data items, it is helpful to have an analysis plan that shows how the information gathered can be used for programs or activities. For example, collecting data on the smoking status of each woman who died is useful only if the information will be used to inform smoking cessation programs geared toward pregnant women. In addition to looking at the frequency of different characteristics or factors, identifying informative rates and ratios, mock-ups of table shells and figures (graphs) may be useful to lead decisions regarding what data need to be collected. If a use for data cannot be identified, do not collect them.

Kathleen Buckley, coordinator of the NFIMR project, learned some valuable lessons from her experience working with NFIMR data collection:

- Decide what you want to know before you develop the core data set.
- Get buy-in from a diverse group of stakeholders.
- Compromise.
- Remember that bigger is not always better.
- A data set is a work in progress.

In collaboration with its partners—who include HRSA and ACOG—CDC's Division of Reproductive Health is working to develop tools to assist in maternal mortality review. Included will be a list of suggested core and secondary data items; instruments for collecting medical, social, and interview data; and software for data input, cleaning, and analyses as well as for report generation. When completed, this data collection system will be available to interested groups.

Sources of information

The committee may draw upon a wide range of sources for information when reviewing a pregnancy-related death. Vital records, medical records, and autopsy or coroner's reports are core records that should be reviewed. Various other types of information that may be useful and are recommended, as

appropriate, include interviews with medical staff, social service staff who may have been involved with the deceased woman, and relatives and friends of the decedent. Two factors can affect the types of information that are requested or obtained:

- State laws that either allow or prohibit access to particular data sources. Some states have statutes that give committees access to a wide array of sources of information; other states have statutes that actually make some information difficult or impossible to use or obtain.
- The amount of financial support for items such as staff, record fees, and postage needed to obtain and process records.

Depending on the details of the case, different data sources may be more or less appropriate. They include the following:

- Vital records.
- Hospital records.
- Prenatal records.
- Postpartum records.
- Clinic records.
- Autopsy reports.
- Coroners' or medical examiners' reports.
- Hospital maternal mortality committee findings.
- Neonatal records.
- WIC records.
- Registries, such as those for tuberculosis, infectious disease, and cancer.
- Domestic violence and child abuse reports.
- Human services files, such as case management records.
- Insurance files.
- Police reports.
- Fatal accident reporting system files.
- State bureau of investigation files.
- Interviews with health care providers, administrators, and the family and friends of the deceased.

Components of a review

To reiterate, a pregnancy-related death warrants a review of both the medical and non-medical or social factors that contributed to the death.

Determining the medical (pathologic) cause of death

One function of a maternal mortality review committee is to determine the medical or pathological cause of death, which may or may not be reflected on the death certificate. Death certificates, medical records, and autopsy reports are the basis for this determination. As noted in Chapter 4, a death certificate often does not indicate that the deceased was pregnant even if she was. If the deceased was or had been pregnant, reviewers must also determine whether the death was caused by the pregnancy or its management or whether the pregnancy aggravated an underlying medical condition. Usually a clear determination of the cause of death and its relationship to the pregnancy can be made. If not, the committee must use its expert judgment to decide.

Determining the effect of health services factors on the woman's death

A variety of health service records may be useful for identifying problems in health care delivery that could be modified to improve maternal health outcomes. Using the framework of barriers to health care access[23] can help identify areas that are important to consider. A trained abstractor or health professional should review written records including, as appropriate, the following:

- Private physician, WIC, clinic, or public health records
  - Maternal medical history.
  - Contraceptive practices.
  - Clinical conditions before and after pregnancy.
- Emergency room/Emergency Medical Team records
  - History of early pregnancy loss.
  - Pre-admission history.
- Prenatal care records
  - Number of visits and date of first visit.
  - Woman's weight.
  - Medications.
  - Parity/gravidity and dates of previous deliveries.

- Underlying medical conditions.
- Blood pressure, hemoglobin, and hematocrit levels.
- Other laboratory test results.
- History of substance abuse.
- Complications of new or preexisting conditions, their diagnosis, and management.

- Records of home visits

- Hospital records
  - Admission sheet(s): date(s) of admission and discharge, source of payment
  - Obstetrical admission assessment

    Nurse

    Time admitted.

    Woman's health status, weight, fundal height.

    Mode of transportation to the hospital.

    Physician

    Admission history.

    Results of physical examination.

    Complications of labor or delivery: tocolysis, steroids, antibiotics; augmentation or induction of labor.
  - Progress notes from medical and nursing staff

    Complications of labor or delivery.

    Tocolysis.

    Medications, number of doses.

    Duration of labor.

    Use and monitoring of anesthesia.
  - Delivery note

    Nurse

    Time of delivery.

    Complications during delivery.

    Length of labor, use of anesthesia.

    Outcome of the pregnancy.

    Physician

    Type of delivery.

    Reasons for cesarean delivery or anesthesia (if appropriate).

    Other procedures.

  - Anesthesia record
    - Type of anesthesia.
    - Patient's weight.
    - Intraoperative events.
  - Recovery room notes

- Autopsy or medical examiner record
  - Cause of death.
  - Date and time of death.
  - Deceased's age, height, and weight.

A combination of structured and semi-structured data abstraction forms can be used to record the information. Structured forms should be formatted to allow accurate and efficient coding, and semi-structured forms should allow for a narrative description of the events leading to death. As mentioned earlier, CDC and partners are working to develop instruments for data collection for maternal death review, which will be available on completion. Appendix E contains examples of abstraction forms already in use in several states.

Interviews with medical personnel who were involved in the care of the woman can provide additional insights into ways in which health services could be improved.

Determining the factors related to the woman, her family, and her community that contributed to the woman's death

Medical factors are only some of the circumstances surrounding a pregnancy-related death. In many cases, non-medical factors play an important underlying causal role in the death. Review non-medical factors that might present barriers to health care access—factors that hindered a woman or her family from recognizing a health problem or seeking care once a problem was recognized.

For example—

- Did the woman intend to become pregnant?
- Did she have knowledge of pregnancy warning signs?
- Would her support systems allow her to act on the knowledge of a suspected medical problem?
- Did she have access to health care?
- Did financial problems or language, cultural, or community issues limit or impair her ability to get or follow medical advice?

Answers to these questions can identify areas of the health care system—and other systems such as education and legislation—that need strengthening. Obtain information from multiple sources. Prenatal and hospital records often have social service assessments, as do many records of home visits. They can provide a wealth of information. If there are no such records, lack of appropriate social services may be a problem that contributed to the death. Police reports may be helpful in cases of deaths from injury because they have information on items such as history of intimate partner violence and the use or non-use of seat belts.

In the United States, there is a growing body of experience with family interviews during the review of fetal and infant deaths; the NFIMR programs report that their family interviews provide extremely beneficial information not available from other sources. In other countries, family interviews or verbal autopsies are frequently used to identify maternal deaths and preventable causes. However, in the United States, there is little experience with family interviews after maternal deaths. In some states, health care providers are concerned that interviewing families may raise a red flag and lead to litigation. This should not happen 1) if it is clear that all maternal and infant deaths are followed by a family interview and 2) if the interviews are seen as a public health intervention to identify systems issues that might have prevented the woman's death and as a way of identifying which social or health care services are needed by the surviving family, including the infant. The value of a family interview as a tool for assessing the underlying causes of maternal death needs to be evaluated as our experience with this process grows.

If proxy interviews are conducted, it is usually with the deceased woman's spouse or partner, other family members, or friends. Because these interviewees are experiencing grief and loss, interviewers should first receive thorough training in how to collect information completely and objectively in a situation in which they must deal sympathetically with the interviewee.

Interviews may be structured, semi-structured, or open-ended. During structured interviews, prescribed questions must be asked in a given order and in given words; semi-structured interviews allow the interviewer to alter words and sequence. Closed-ended questions have a list of possible

responses; open-ended questions allow those interviewed to answer as freely and as fully as they wish. When interviewing someone about a pregnancy-related death, a combination of interview formats may work best: ask closed-ended questions about demographics and other facts and open-ended questions about the interviewee's interpretations of events. CDC and partners are developing a questionnaire that can be used for family interviews. Appendix F is an example of a family interview questionnaire used in one state.

Determining factors related to the health care system that contributed to the woman's death

We distinguish between the health care system as a whole and the services provided by individual health care practitioners. Factors related to the health care system include those related to medical insurance, bureaucratic requirements for obtaining Medicaid, access to health care providers that accept Medicaid, issues with managed care organization plans, availability of health education, prenatal and family planning services, care coordination and other social services, regionalization of maternal health care, and referrals to the appropriate level and types of care and to the appropriate social services.

Correcting or improving cause-of-death information on a death certificate

According to the NCHS (which uses ICD terms and definitions for maternal mortality), the completeness and quality of maternal death reporting could be improved if physicians completed the cause-of-death section of the death certificate more accurately. If a maternal mortality review committee or other investigative body discovers that the cause of death is incorrect, the certifying physician should be contacted and encouraged to file an amended certificate with the state office of vital statistics. However, NCHS closes its statistical file 7 months after the end of the calendar year, so any changes to records made after that time would be reflected in the state, but not the national, death records.

Physicians receive minimal training in how to correctly complete death certificates. The cause of death on many certificates does not adequately reflect the events leading to the death, as evidenced by the under-ascertainment of pregnancy-

related deaths when case identification is based solely on death certificate data. Maternal mortality review committees or state medical associations, in cooperation with state vital statistics departments, should promote continuing education for physicians and hospital personnel in this important public health task. (Written directions are available in Appendix A and on the Internet from NCHS at http://www.cdc.gov/nchs/about/major/dvs/handbk.htm.)

One method states use to ensure training of practicing physicians in a particular subject is to require continuing education credits on the topic of interest in order to renew a medical license. With the advent of new methods of distance learning (e.g., videos and, particularly, Internet courses), a state could develop and require completion of a course on the correct completion of vital statistics for a physician to be relicensed.

Legal issues: liability and confidentiality

Legal concerns are a major deterrent to pregnancy-related mortality surveillance. Issues such as anonymity, confidentiality, and legal protection are concerns for families, clinicians, health care facilities, and health departments. It is vital that those responsible for the surveillance system be aware of their state statutes and the protections they do and do not offer. This information should be included, in clear language, in all communications with those whose participation is needed in the surveillance process. If a state's laws are not adequate, efforts should be made to have appropriate laws or regulations enacted. Although this requires time and effort, the results can be invaluable for making the system function.

The legal protection offered to maternal mortality review committees varies from state to state and can change with time. Various levels of protection safeguard members of review committees from civil liability and safeguard the confidentiality of information collected during the review process. It is essential to get legal advice about your state's statues when planning the structure of the maternal mortality review committee. Once established, the committee should also regularly consult with legal counsel.

Concerns about liability and confidentiality have caused many state maternal mortality review committees to cease functioning and others to consider doing so. Committee members and staff

worry about their own liability and whether committee proceedings could be used in litigation. Health care providers are often concerned that they might incur liability if they cooperate with the committee's investigation. These perceptions hamper the committee's ability to obtain accurate information about a pregnancy-related death.

In reality, however, the risk of liability related to participating on an appropriately structured *expert review committee*, such as a maternal mortality review committee, is negligible in the overwhelming majority of states. A study of legal protections in each state showed that—with few exceptions—most states protect members of expert review committees and providers of medical information from civil liability. They generally also protect information gathered during case review from disclosure or from use in other litigation.

Those planning to form a maternal mortality review committee should investigate that state's relevant statues to learn the extent of its protections and the statutory requirements for the structure and conduct of committee work. Gathering this information before starting or reactivating a committee can alleviate committee member concerns and ensure the most legal protection possible. For example, standing committees of the state medical society may, in some states, be able to seek greater protection by having their work authorized by the health department.

Appendix G is excerpted from an article entitled "State Level Expert Review Committees—Are They Protected?" It was published when the status of protective laws was first reviewed in 1989.[24] The excerpted portion is a general discussion of the issues related to maternal mortality review committees. Appendix D is the 2000 ACOG review of applicable state statutes. This recent review is a good reference on the immunity and confidentiality protections in the states.

Recommended steps to help ensure confidentiality

- Record no identifiers on data abstraction forms so that data forms are anonymous.
- Have each person associated with the committee sign a pledge of confidentiality.
- Provide case summaries to review committee members only if they confirm in advance that they will attend the meeting at which decisions on those cases will be made.
- After each case has been reviewed, collect all summaries from committee members and shred them immediately after the meeting.

Adapted from a presentation on pregnancy-associated mortality review, January 9, 2001. A. Phelps, Florida Department of Public Health.

6 Analyzing and Interpreting the Findings

Although they occur too frequently and are in many cases preventable, pregnancy-related deaths are relatively rare events in developed countries such as the United States. Therefore, the statistics usually calculated, such as the pregnancy-related mortality ratio, are subject to wide variation if they are calculated for small areas, such as most cities and less populous states. Consequently, it is hard to use such statistics to monitor change over a short time. Therefore, to gain the most insight into pregnancy-related mortality, the information gathered during the review of pregnancy-related deaths should be analyzed both quantitatively and qualitatively.

Quantitative analysis

In analyzing pregnancy-related mortality data, it is helpful to look for patterns and trends among the deaths by a variety of characteristics (see "Issues related to small numbers," page 43).

First tabulate the data by the basic epidemiologic descriptors of person, place, and time.

Person: Age, race/ethnicity, education, socioeconomic status.

Place: Geographic location where deceased woman resided; where she delivered; where she died; characteristics of place of residence (e.g., urban or rural area, proximity to environmental toxins); the level and size (number of deliveries per year) of the hospital where pregnancy ended.

Time: Date of death, season, day of week, time of day.

Then tabulate the data by other variables:

Gravidity and parity: Number of previous pregnancies and births.

Pregnancy outcome: Live birth, stillbirth, induced or spontaneous abortion, ectopic pregnancy, undelivered pregnancy, molar pregnancy, multiple gestation.

Gestational duration:	Number of weeks of pregnancy.
Method of termination:	Vaginal birth, cesarean birth, surgical or medical termination for induced abortion or ectopic pregnancy.
Event-to-death interval:	Time of death relative to the pregnancy, delivery, abortion, or termination of pregnancy.
Cause of death:	Immediate cause (e.g., hemorrhage, sepsis); associated conditions (e.g., placenta previa, primary hypertension).

Next compare the basic characteristics of person, place, and time *between groups* (e.g., between black and white women, between younger and older women). The simplest way to analyze data is to determine where, when, and among whom the greatest number of deaths occur. However, keep in mind that if one of the groups being compared is larger than the other, then the *number* of deaths may be greater in that group even if the *risk* of pregnancy-related death is the same or smaller.

Calculating the pregnancy-related mortality ratio is the traditional way to eliminate the effect of the size of the population at risk.

$$\text{Pregnancy-related mortality ratio:} \quad \frac{\text{Number of pregnancy-related deaths}}{\text{Number of live births}} \times 100{,}000$$

To calculate the pregnancy-related mortality ratio for various groups, the number of pregnancy-related deaths (the numerator) and the number of live births (the denominator) must be from the same group. For example, to calculate the pregnancy-related mortality ratio for women of different ages, one needs to know the number of live births and the number of pregnancy-related deaths in each age group. Data on all live births in a state are collected and computerized by the state office of vital statistics. In addition, NCHS has public-use data tapes of all live births in the United States, by state, with much of the data needed to calculate the various denominators. Some other measures used to understand and compare mortality caused by pregnancy are in Appendix H.

Useful basic comparisons for quantitative analyses might include the following:

By person: Compare the data for different subpopulations (e.g., compare women of different ages, race or ethnicity, socioeconomic status, residence, parity).

By place: Compare the risk of pregnancy-related mortality for women in different regions of the state or across areas with different medical services or different access to medical services. Compare the risk for women in your state with the risk for women in other states or in the nation as a whole.

By time: Examine trends over time in the state overall or by specific characteristics.

Qualitative analysis

Even if the number of deaths is small and quantitative analysis is difficult, qualitative analysis should be done, because it may provide insights into the factors that led to the death. Although the medical cause of many pregnancy-related deaths may be the same, the reasons for those deaths may vary. For example, a woman may die of bleeding for any of several reasons: she may not have been aware of the seriousness of her symptoms and may not have taken prompt action; she may not have had the financial resources for appropriate medical care; or she may have received medically inadequate care.

A qualitative analysis takes into account the medical and non-medical factors that contribute to a pregnancy-related death. For qualitative analysis, one needs to analyze data on the deceased woman, the health care she received, the health care system as it relates to her care, and any state or local policies as they affected her. Examples of factors possibly related to pregnancy-related deaths include the following:

Woman:

- Her personal risk factors (e.g., substance abuse).
- Her knowledge of pregnancy and of the symptoms associated with complications.
- Her beliefs about the need for health care during pregnancy.
- Her previous experience and comfort with receiving health care and with the health care system.

Health care provider:	■ The provider's knowledge and skill. ■ The resources of the health care facility. ■ The skills and schedules of staff. ■ The attitude and courtesy of staff.
Health care system:	■ The woman's ease or lack of access to the health care system. ■ The availability of health education, prenatal care, and family planning services. ■ The availability of levels of service appropriate to the woman's needs. ■ Appropriate credentialing by relevant groups of individuals and institutions that provide care.
Policy:	■ The availability of federal or state financing and insurance coverage.

Using quantitative and qualitative data together

Separately, qualitative and quantitative data are frequently unsatisfactory if we are attempting to understand the pathways to pregnancy-related death and to develop effective and efficient interventions. Quantitative analysis shows which groups are at increased risk for pregnancy-related death but offers no insight into the specific reasons. Qualitative analysis provides information on individual cases, but evaluating the significance of individual cases in a case series can be difficult. Qualitative analysis tells why women with certain characteristics died but not if the number of deaths is out of proportion to the number of such women in the population.

A combination of quantitative and qualitative analyses can provide more insights than either can provide alone. Begin with quantitative analysis. Compare groups of women, determine which groups are at higher risk for pregnancy-related death. Is it, for example, women of a certain age, ethnicity, place of residence, parity? Then, using qualitative data from the review process, look for differences in what happened with and to the women in the high risk group that might have made them more likely to die. Were there differences in lifestyle; access to health care, including family planning, preconception care, prenatal or delivery care; or the type or quality of care received?

Issues related to small numbers

Data collected by states on births and deaths are complete counts of these events in the state and are not subject to sampling error. However, when the number of pregnancy-related deaths is small, they often fluctuate from year to year, which causes variation in the pregnancy-related mortality ratio (PRMR) or maternal mortality ratio (MMR). For instance, according to vital statistics reported to NCHS, Michigan had nine maternal deaths in 1995 (MMR = 6.7) and five in 1996 (MMR = 3.8) for a nearly 50% decrease. However, because the number of deaths is small, the ratios are not reliable. In fact, the 95% confidence intervals (3.1, 12.7) and (1.2, 8.9) overlap, and the difference is not statistically significant.

Many states have fewer than 20 pregnancy-related deaths annually. Generally, NCHS recommends reporting MMRs only when there are at least 20 deaths (relative standard error <23%).[26] One way to get more reliable estimates of pregnancy-related mortality is to aggregate several years. Depending on the number of deaths, from 2 to 10 years can be aggregated. Rolling averages of, for example, 5 years may also allow numbers sufficient for analysis. However, by aggregating several years, the ability to detect trends or changes over time is lost. Another approach to dealing with the problem of small numbers is to combine data from several similar states in a region—either the federal public health regions or the ACOG districts. Aggregating data and thus increasing the number of pregnancy-related deaths available for analysis can improve the state's understanding of the causes of deaths and its ability to develop and implement interventions.

If there are fewer than five deaths, ratios should not be reported without a clearly stated explanation that the point estimate is extremely unreliable; confidence intervals must be included with these point estimates. In such cases, pregnancy-related deaths are better treated as sentinel events. Each should be reviewed and reported separately (as in a line listing), although in a manner that preserves anonymity.

Although it is best to aggregate years so as to have more than 19 deaths in the numerator, some states have few deaths and must publish data on 5 to 19 deaths. In such cases, confidence intervals should always be provided, and the estimates should have a caveat that they are based on small numbers and should be used with caution.

When the number of pregnancy-related deaths is small, the PRMR or MMR is not an adequate indicator of changes in maternal health. Ideally, other indicators should be used. Nationally, new indicators for monitoring pregnancy-related morbidity, including very severe or near-miss morbidity, are being considered (see Chapter 9 “Special Issues”).

An important issue that arises because of the relatively small number of pregnancy-related deaths in most states is the confidentiality of the review process. At a local level, many people on a review committee might know the families of the women who die or their health care providers, and confidentiality could not be maintained. For this reason, most maternal mortality reviews are done at the state level.

7 Taking Action

The primary objective of pregnancy-related mortality surveillance is to take action to reduce future pregnancy-related mortality and morbidity. However, in too many cases, it is just at this important point that the process stops. Because action is the ultimate goal of the system, it is important that those with the ability to make the needed changes understand the findings and recommendations of the analysis. Those with the ability to take action should either be members of the committee, have designated representatives on the committee, or receive a detailed report of the findings of both the quantitative and qualitative analysis. Changes to decrease pregnancy-related mortality will need to take place on many levels, so the analyses need to be disseminated to a broad array of individuals and organizations. Devising a formal plan for ways of disseminating the information and having changes made is part of any committee's work.

The issue of protecting the confidentiality of the deceased woman and her family, her care providers, and members of the review committee runs throughout the surveillance process. Those who abstract the medical records or interview family members will obviously know the identities of those involved. Case summaries provided at review committee meetings for discussion should have identifying data removed, although some people present may be familiar with the case. Written assurances of confidentiality should be obtained from members and staff of the review committee as well as all who attend the review meeting, promising that none of the presentations, discussions, documents, or proceedings will be shared outside the meeting.

For any dissemination beyond the review committee, content must be carefully reviewed to avoid breaches in confidentiality and misuse of information. Any written reports or summaries should focus on ways to improve the system and not single out errors committed. For example, if a woman died of hemorrhage because blood was not available, then the needed action is to ensure that blood bank services are adequate at hospitals with emergency rooms or maternity units, without focusing on lack of blood at the hospital involved in the specific case.

Making and implementing recommendations

The actions taken to decrease pregnancy-related mortality will be determined by the findings of the review process and analysis. Thus, it is impossible to say what the specific recommendations will be. Interventions to improve maternal health and decrease pregnancy-related mortality fall into three types of strategies, which are defined below along with some examples.

Primary prevention strategies: These strategies prevent the condition from occurring through education and services. Examples include improving sex education and fully funding family planning programs to prevent unintended and high-risk pregnancies; implementing nutrition programs; improving preconception care; and improving diagnosis and treatment of sexually transmitted diseases to prevent ectopic pregnancy and intrapartum and postpartum infections.

Secondary prevention strategies: These strategies detect and treat conditions early in order to minimize the effects. Examples include increasing community awareness and patient knowledge about normal pregnancy and the signs and symptoms of possible problems; increasing emphasis on patient satisfaction with care in order to improve patients' adherence to their physicians' instructions or recommendations; and improving prenatal care, labor and delivery techniques, and postpartum follow-up.

Tertiary prevention strategies: These strategies treat conditions in an optimal fashion in order to reduce case-fatality rates. Examples include improving obstetric and medical treatment of complications and improving practices, facilities, referral services, and regionalization of services.

Disseminating findings and recommendations

Communicating with programs and other groups, including the public and the news media

Preventing pregnancy-related deaths involves a variety of individuals and groups. Because many people outside the state's surveillance system are not familiar with surveillance activities or terms, communications must be easy to understand and

compelling. Determine who needs to know the results of your reviews. Find out which groups or individuals can use the findings about the pathways to such deaths. They may be hospital associations, programs for women, insurance carriers, medical and nursing associations, legislators who appropriate funding, credentialing agencies, consumer advocacy groups, or federal agencies involved in compiling and reporting national surveillance data. Concise bulletins, fact sheets, and briefing notes spread the information efficiently and effectively. An example of an effective report from a maternal mortality review committee—developed by Massachusetts—is in Appendix I and on the Internet at http://www.state.ma.us/dph/pubstats.htm.

Feedback to those involved in surveillance

Establish regular communications with the people who work within the surveillance system. Such people may include state health department personnel involved in family health, Title V Maternal and Child Health programs, epidemiology, and vital records; Medicaid staff; district and county health officers; maternal mortality review committee members; clinicians; hospital administrators, coders, clergy, and others involved in identifying and reviewing pregnancy-related deaths.

Good communication improves the surveillance system by promoting discussion of the surveillance process and showing how each surveillance task produces useful information.

Communication methods include reporting results of data analyses, writing reports, holding annual or semi-annual meetings, and personal encounters (see Box 5). The free exchange of ideas is especially helpful for maintaining momentum and vitality. Have face-to-face or telephone contact with the key individuals. Encourage these individuals to do the same with their staff or group.

Effective feedback also includes training and giving technical assistance on the various tasks involved in surveillance. For example, coders may need training in how to use new forms. Hospital review committees may need technical assistance in setting up a computerized system that is more responsive to surveillance needs. Vital records personnel may need to be educated about how to provide the data needed for finding and confirming pregnancy-related deaths, including how to link vital records and other data sets.

Methods of disseminating results of surveillance

- Printouts of tabulated data.
- Committee reports.
- Interdepartmental reports.
- Newsletters and bulletins.
- Legislative briefings.
- Fact sheets.
- Press releases.
- Telephone conversations.
- E-mail correspondence.
- Annual or semi-annual meetings.
- Consultations.
- Technical assistance.
- Scientific articles.
- Training programs.
- Posters.
- Messages from clergy.
- MTV.

Box 5

8 Evaluating the Surveillance System

Evaluation is an integral step of any surveillance system, and it serves many purposes. The overall objective of evaluation is to ensure that the surveillance system is both effective and efficient. To achieve this objective, all components of a surveillance system must be evaluated, in addition to measuring how successful the system is at meeting its objectives. Furthermore, evaluation extends beyond the data collection and review components of the surveillance system itself. It is essential to evaluate the interventions and actions developed as a result of the review process. The results of the evaluation of a surveillance system will be used as a basis for modifying or redeveloping the system to serve its purpose better.

An evaluation plan should be designed into a surveillance system, and the system should undergo evaluation on an ongoing basis. There are two separate, independent, but equally essential questions that need to be answered during an evaluation:

- Is the system functioning properly as designed? (internal evaluation)
- Is the system achieving the objectives for which it was designed? (external evaluation)

Of course, before the system can be evaluated, both the design and the objectives of the system have to be clearly defined and documented so that those performing the evaluation can compare what is happening with what is supposed to happen.

Internal evaluation

Any surveillance system must undergo reassessment of its objectives and methods. For internal evaluation, the main questions are these:

- Is the system meeting its objectives?
- Can its utility and efficiency be improved?
- Is it operating as effectively as possible?

Internal evaluation should include a description of how the system operates, an assessment of the system's quantitative and qualitative attributes, and an estimate of the cost of the system (including, for example, personnel time and equipment) in relation to available resources. The attributes of the system that should be evaluated include the operation of the system, its simplicity, flexibility, sensitivity and specificity, representativeness, timeliness, and acceptability to its users.

External evaluation

In an external evaluation the main purpose is to learn whether the objectives of the surveillance system have been achieved:

- Does it serve a useful public health function?
- Did the system generate solutions to problems?
- Was it useful to planners, researchers, health care providers, and public health professionals?
- How was the information used? Was it worth the effort?
- Are those who participated in the system willing to continue?
- What can be done to improve each attribute of the system?

Because public health surveillance is oriented toward action, evaluation should address two questions in particular:

- Are the findings of the surveillance process being communicated to those who need to know them?
- Has the information had a beneficial effect on the health problem or condition of interest?

When evaluating a surveillance system, one must decide which criteria are most relevant for that specific system. Specific steps for conducting an external evaluation of the surveillance system should be developed and documented.

9 Special Issues

Funding

Maternal mortality surveillance is an important state function and should be integrated into routine maternal and child health program activities. Reviews, conclusions, recommendations, and implementation of prevention strategies should all be linked through the agencies responsible for the health of women in the state. State funds should be allocated to maintain ongoing pregnancy-related surveillance at the state level. Specific caucuses within the state legislature or public interest groups may become advocates for funding surveillance activities if they are educated about the importance of the issues. Frequently the women's caucus will be interested in this issue. In addition, certain groups (e.g., black, Hispanic, or rural women) who are at increased risk of pregnancy-related problems may provide support.

In some cases, technical support and seed money may be needed for start-up activities, and special in-depth projects may call for extra resources. In some cases, federal agencies, including CDC and the Health Resources and Services Administration, have provided technical and financial support to develop and implement such activities. Support may also be available through national organizations involved in the health care of mothers as well as from nonprofit organizations (e.g., The Association of Maternal and Child Health Programs, CityMatCH, Council of State and Territorial Epidemiologists, ACOG, the American College of Nurse-Midwives, March of Dimes). Collaboration with such organizations is most likely to be effective at the level at which maternal mortality review is organized (usually states but sometimes large metropolitan areas).

Monitoring maternal health and morbidity/near misses

In many states, the annual number of pregnancy-related deaths is small, and pregnancy-related mortality alone is not an adequate indicator of maternal health. Furthermore, because the decline in pregnancy-related mortality has stalled

nationally since 1982,[2] we need to look at what happens to women with serious pregnancy-related morbidity in order to prevent their deaths. We need to know why some women survive major complications of pregnancy and others die.

The U.S. Department of Health and Human Services has begun to develop new indicators for monitoring maternal health. One indicator previously used was the number of antepartum hospitalizations for every 100 deliveries.[27,28] However, since antepartum complications are increasingly treated on an outpatient basis, the recent fall in antepartum hospitalizations almost certainly does not reflect improvements in maternal health.[28] Experts are now looking at the use of serious life-threatening morbidity, referred to as near-miss events, as indicators of maternal health problems. Such events could include eclampsia; HELLP syndrome; hemorrhage requiring transfusion; post-delivery hysterectomy; cesarean hysterectomy; cardiac arrest; and conditions requiring intubation, ventilation, intensive care, or life support.

The proposed revision of the U.S. birth certificate has check boxes for some of these events and has enormous potential to improve monitoring of maternal health. Other methods for monitoring near-miss events are also being examined, such as use of statewide computerized hospital discharge records.

Some states have begun to review maternal morbidity as part of the maternal mortality review process. As experiences accumulate, they will be evaluated and the results disseminated. The recommendations made in this document will be modified to reflect new knowledge.

Epilogue

Each year in the United States, 1,000 women die of pregnancy-related complications, making such deaths relatively uncommon. They are even more uncommon in an individual state or city. Why then should the state mount an intervention to prevent what may appear to be random incidents?

There are several reasons. First, improving the health of women and children is important—the future of our society depends on it. And our society needs to be aware of this fact. Second, there is much we still do not know about pregnancy and its complications. For example, why do some women have life-threatening complications? Why do some women survive them and others do not? Why are some groups of women more likely to die? Third, we need to understand how to foster the best outcome for all women, children, and families—strategies to make pregnancy and childbirth safer for all women.

So whose faces are behind the numbers? What were their stories? What were their dreams? They left behind children and families. They also left behind clues as to why their lives ended early. It is the obligation of those who cared for and about these women to retrace their journeys through pregnancy in an effort to unravel the circumstances surrounding their deaths. The pregnancy-related mortality ratio will never be zero, but many pregnancy-related deaths can be avoided. The plateau in the U.S. maternal mortality ratio and the racial disparity in pregnancy-related mortality will be reduced only by diligently searching for the reasons for these rare but devastating events and applying what is learned to the care of all pregnant women.

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References

1. Berg C, Atrash H, Koonin L, Tucker M. Pregnancy-related mortality in the United States, 1987-1990. Obstet Gynecol 1996;88:161-7.
2. Centers for Disease Control and Prevention (CDC). Maternal mortality—United States, 1982-1996. Mor Mortal Wkly Rep 1998;47:705-7.
3. Centers for Disease Control and Prevention (CDC 99B). Healthier mothers and babies. Mor Mortal Wkly Rep 1999;48:849-57.
4. Hopkins FW, Mackay AP, Koonin LM, Berg CJ, Irwin M, Atrash HK. Pregnancy-related mortality in Hispanic women in the United States. Obstet Gynecol 1999;94:721-5.
5. Centers for Disease Control and Prevention. Pregnancy-related deaths among Hispanic, Asian/Pacific Islander, and American Indian/Alaskan Native women—United States, 1991-97. Mor Mortal Wkly Rep 2001;50:361-4.
6. World Health Organization. Manual of the international statistical classification of diseases, injuries, and causes of death (ICD-9), vol. 1. Geneva (Switzerland): World Health Organization; 1977.
7. National Center for Health Statistics (NCHS). Physicians' handbook on medical certification of death. Hyattsville (MD): Public Health Service; 1996. Available from: URL: http://www.cdc.gov/nchs/data/hb_cod.pdf.
8. World Health Organization. International statistical classification of disease and related health problems. Tenth Revision (ICD-10). Geneva (Switzerland): 1992.
9. Atrash HK, Alexander S, Berg CJ. Maternal mortality in developed countries—not just a concern of the past. Obstet Gynecol 1995;86:700-5.
10. Neuzil KM, Reed GW, Mitchell EF, Simonsen L, Griffin MR. Impact of influenza on acute cardiopulmonary hospitalizations in pregnant women. Am J Epidemiol 1998;148:1094-102.

11. Bessinger R, Clark R, Kissiner P, Rice J, Coughlin S. Pregnancy is not associated with the progression of HIV disease in women attending an HIV outpatient program. Am J Epidemiol 1998;147:434-40.

12. Hoyert DL, Kochanek KD, Murphy SL. Deaths: final data for 1997. In: National Vital Statistics Reports, vol. 47, no. 19. Hyattsville (MD): National Center for Health Statistics; 1999.

13. Hopkins J, Marcus M, Campbell SB. Postpartum depression: a critical review. Psychol Bull 1984:95;498-515.

14. Wilt S, Olson S. Prevalence of domestic violence in the United States. J Am Med Womens Assoc 1996;51:77-82.

15. Jocums SJ, Berg CJ, Entman SS, Mitchell EF. Postdelivery mortality in Tennessee, 1989-1991. Obstet Gynecol 1998;91:766-70.

16. Dietz PM, Rochat R, Thompson BL, Berg CJ, Goldner T, Griffin G. Differences in the risk of homicide and other fatal injuries between postpartum women and other women of childbearing age: implications for prevention. Am J Public Health 1998;88:641-3.

17. Centers for Disease Control and Prevention (CDC 99A). Achievements in public health, 1900-1999: motor vehicle safety: a 20th century public health achievement. Mor Mortal Wkly Rep 1999;48:369-74.

18. Bouvier-Colle MHH, Varnoux N, Costes P, Hatton F. Reasons for the underreporting of maternal mortality in France, as indicated by a survey of all deaths among women of childbearing age. Intl J Epidemiol 1991;21:717-21.

19. Mackay AP, Rochat R, Smith JC, Berg CJ. The check box: determining pregnancy status to improve maternal mortality surveillance. Am J Prev Med 2000;19(Suppl):35-9.

20. Centers for Disease Control and Prevention (CDC). Pregnancy-related mortality—Georgia, 1990-1992. Mor Mortal Wkly Rep 1995;44:93-5.

21. Jocums SJ, Mitchell EF, Entman SS, Piper JM. Monitoring maternal mortality using vital records linkage. Am J Prev Med 1995;11:75-8.

22. Adams MM, Wilson HG, Casto DL, Berg CJ, McDermott JM, Gaudino JA, McCarthy BJ. Constructing reproductive histories by linking vital records. Am J Epidemiol 1997;145:339-48.

23. Graham W. Safe motherhood needs assessment: maternal death review. Geneva (Switzerland): World Health Organization; 1996. Report no. WHO/RHT/MSM/96.18.

24. Wright R, Smith JC. State level expert review committees—are they protected? Public Health Rep 1990;105:13-23.

25. Buckley KA, Koontz AM, Casey S. Fetal and infant mortality review manual: a guide for communities. Washington (DC): American College of Obstetricians and Gynecologists; 1998.

26. Murphy SL. Deaths: Final Data for 1998. In: National Vital Statistics Reports, vol. 48, no. 11. Hyattsville (MD): National Center for Health Statistics; 2000.

27. Franks AL, Kendrick JS, Olson DR, Atrash HK, Saftlas AF, Moien M. Hospitalization for pregnancy complications, United States, 1986 and 1987. Am J Obstet Gynecol 1992;166:1339-44.

28. Bennett TA, Kotelchuck M, Cox CE, Tucker MJ, Nadeau DA. Pregnancy-associated hospitalizations in the United States in 1991 and 1992: a comprehensive review of maternal morbidity. Am J Obstet Gynecol 1998;178:346-54.

Appendix A

Instructions for Completing the Cause-of-Death Section of Death Certificates

NATIONAL CENTER FOR HEALTH STATISTICS

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control

CDC
CENTERS FOR DISEASE CONTROL

Instructions for Completing the Cause-of-Death Section of the Death Certificate

Accurate cause-of-death information is important:

- To the public health community in evaluating and improving the health of all citizens; and
- Often to the family, now and in the future, and to the person settling the decedent's estate.

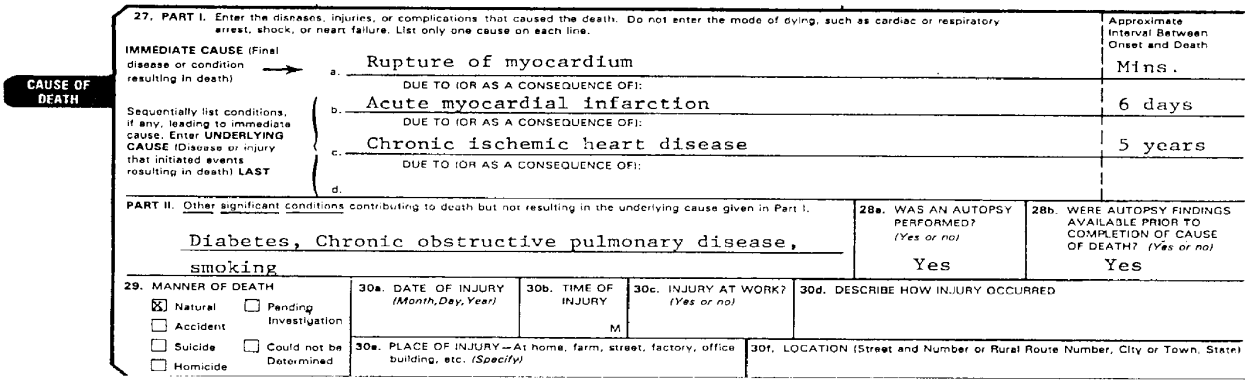
The cause-of-death section consists of two parts. **Part I** is for reporting a chain of events leading directly to death, proceeding from the **immediate cause** of death (the final disease, injury, or complication directly causing death) to the **underlying cause** of death (the disease or injury that initiated the chain of morbid events which led directly to death). **Part II** is for reporting all other significant diseases or conditions that contributed to death but did not result in the underlying cause of death as given in **Part I.**

The CAUSE-OF-DEATH information should be YOUR best medical OPINION.

In completing the CAUSE-OF-DEATH Section:

- Use a typewriter with good black ribbon and clean keys. If a typewriter is not available, print legibly using permanent **black** ink.
- Report each DISEASE, ABNORMALITY, INJURY, OR POISONING that you believe ADVERSELY AFFECTED the decedent. A condition can be listed as "probable" even if it has not been definitively diagnosed.
- If, in your opinion, the use of alcohol, tobacco, other substance by the decedent, or a recent pregnancy or injury caused or contributed to death, then this condition should be reported.

Examples of properly completed medical certifications.



CAUSE OF DEATH

27. PART I. Enter the diseases, injuries, or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock, or heart failure. List only one cause on each line.

Approximate Interval Between Onset and Death

IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Rupture of myocardium — Mins.

DUE TO (OR AS A CONSEQUENCE OF):

Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE (Disease or injury that initiated events resulting in death) LAST

b. Acute myocardial infarction — 6 days

DUE TO (OR AS A CONSEQUENCE OF):

c. Chronic ischemic heart disease — 5 years

DUE TO (OR AS A CONSEQUENCE OF):

d.

PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in Part I.

Diabetes, Chronic obstructive pulmonary disease, smoking

28a. WAS AN AUTOPSY PERFORMED? (Yes or no): Yes

28b. WERE AUTOPSY FINDINGS AVAILABLE PRIOR TO COMPLETION OF CAUSE OF DEATH? (Yes or no): Yes

29. MANNER OF DEATH: ☒ Natural ☐ Accident ☐ Suicide ☐ Homicide ☐ Pending Investigation ☐ Could not be Determined

30a. DATE OF INJURY (Month, Day, Year)

30b. TIME OF INJURY

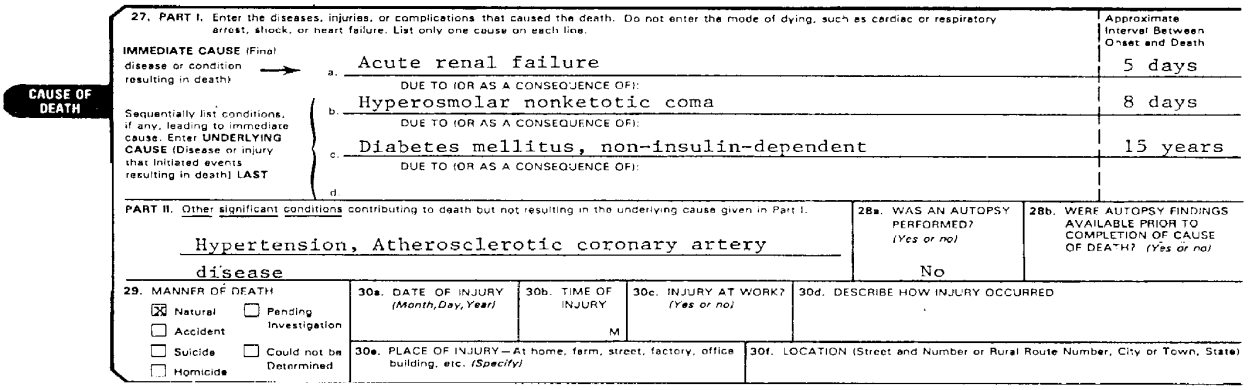
M

30c. INJURY AT WORK? (Yes or no)

30d. DESCRIBE HOW INJURY OCCURRED

30e. PLACE OF INJURY—At home, farm, street, factory, office building, etc. (Specify)

30f. LOCATION (Street and Number or Rural Route Number, City or Town, State)



CAUSE OF DEATH

27. PART I. Enter the diseases, injuries, or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock, or heart failure. List only one cause on each line.

Approximate Interval Between Onset and Death

IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Acute renal failure — 5 days

DUE TO (OR AS A CONSEQUENCE OF):

Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE (Disease or injury that initiated events resulting in death) LAST

b. Hyperosmolar nonketotic coma — 8 days

DUE TO (OR AS A CONSEQUENCE OF):

c. Diabetes mellitus, non-insulin-dependent — 15 years

DUE TO (OR AS A CONSEQUENCE OF):

d.

PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in Part I.

Hypertension, Atherosclerotic coronary artery disease

28a. WAS AN AUTOPSY PERFORMED? (Yes or no): No

28b. WERE AUTOPSY FINDINGS AVAILABLE PRIOR TO COMPLETION OF CAUSE OF DEATH? (Yes or no)

29. MANNER OF DEATH: ☒ Natural ☐ Accident ☐ Suicide ☐ Homicide ☐ Pending Investigation ☐ Could not be Determined

30a. DATE OF INJURY (Month, Day, Year)

30b. TIME OF INJURY

M

30c. INJURY AT WORK? (Yes or no)

30d. DESCRIBE HOW INJURY OCCURRED

30e. PLACE OF INJURY—At home, farm, street, factory, office building, etc. (Specify)

30f. LOCATION (Street and Number or Rural Route Number, City or Town, State)

(See reverse for instructions on the completion of each item)

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ITEM 27 – CAUSE OF DEATH

PART I (Chain of events leading directly to death)

- Only **one** cause should be entered on each line.
- Line (a) **MUST ALWAYS** have an **immediate cause of death entry. DO NOT** leave blank.
- The mode of dying (for example, cardiac arrest and respiratory arrest) should not be used. However, if a mode of dying seems most appropriate to you for line (a), then you must always list its cause(s) on the line(s) below it (for example, cardiac arrest due to arrhythmia due to ischemic cardiac disease).
- Line (b) has the condition, **if any,** that gave rise to the immediate cause of death. If this in turn resulted from a further condition, report that condition on line (c). Report the full sequence; ADD more lines when necessary.
- **ALWAYS** enter the **underlying cause of death** on the lowest used line in Part I.
- The words "DUE TO (OR AS A CONSEQUENCE OF)," which are printed between the lines of Part I, apply to etiological or pathological sequences as well as to sequences in which an earlier condition is believed to have prepared the way for a subsequent cause by damage to tissues or impairment of function.
- If an organ system failure such as congestive heart failure, hepatic failure, renal failure, or respiratory failure is listed as a cause of death, always report an etiology for the end stage condition on the line(s) beneath it (for example, congestive heart failure due to ischemic cardiomyopathy).
- For each cause indicate the best estimate of the interval between the presumed onset and the date of death. The terms "approximately" or "unknown" may be used. **DO NOT** leave blank.

PART II (Other significant conditions)

- Enter all diseases or conditions that contributed to death that were not listed in the chain of events in Part I and that did not result in the **underlying cause of death.**
- If two or more possible sequences resulted in death, report in Part I the one that, in your opinion, most directly caused death. Report in Part II the other conditions or diseases.

ITEM 28 – AUTOPSY

- 28a - Enter "Yes" if either a partial or full autopsy was performed. Otherwise enter "No."
- 28b - Enter "Yes" if autopsy findings were available prior to the completion of the cause of death. Otherwise enter "No" or leave this item blank if no autopsy was performed.

ITEM 29 – MANNER OF DEATH

- Deaths in which an accident, suicide, or homicide has occurred, **MUST BE REFERRED TO THE CORONER OR MEDICAL EXAMINER.** There are also other circumstances which require that the coroner or medical examiner be contacted. **IT IS IMPORTANT THAT YOU FAMILIARIZE YOURSELF WITH THESE REQUIREMENTS FOR YOUR STATE.** Thus, in most cases certified by a physician other than a coroner or medical examiner, the manner of death will be "natural."

CHANGES TO CAUSE OF DEATH

- Should additional medical information or autopsy findings become available that would change the cause of death originally reported, the original death certificate should be amended by the certifying physician by **immediately** reporting the revised cause of death to the State Vital Records Office.

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Appendix B

States with Check Boxes to Indicate Pregnancy on Their Death Certificates

Below is a chart showing the NCHS reporting areas that have a check box or question on their death certificates to indicate a certain interval between a woman's death and the end of pregnancy. Also given is the text of the question that asks about the time between pregnancy and death. United States, 1997.

Reporting area	Interval between pregnancy and death	Text of question about pregnancy
Alabama	42 days	Was there a pregnancy in the last 42 days? (Specify yes, no, or unk)
Florida	3 months	If female, was there a pregnancy in past 3 months? Y N
Georgia	90 days	Other significant conditions: Conditions contributing to death but not related to cause given in part IA: (if female, indicate if pregnant or birth occurred within 90 days of birth).
Illinois	3 months	If female, was there a pregnancy in past 3 months? Y N
Indiana	90 days	Was decedent pregnant or 90 days postpartum? Yes, No
Iowa	12 months	If female, was there a pregnancy in past 12 months? (Yes No)
Louisiana	90 days	Was decedent pregnant or less than 91 days postpartum? (YES or NO)
Maine	90 days	Other significant conditions contributing to death but not resulting in the underlying cause given in part 1. If not specified in part 1, indicate if the decedent was pregnant or less than 90 days postpartum at the time of death.
Missouri	90 days	If deceased was female 10–49, was she pregnant in the last 90 days? Yes No Unknown
Nebraska	3 months	If female, was there a pregnancy in past 3 months? Yes No
New Jersey	90 days	If female, was she pregnant at death, or any time 90 days prior to death? Yes No

(continued)

Reporting area	Interval between pregnancy and death	Text of question about pregnancy
New Mexico	6 weeks	Was decedent pregnant within last 6 weeks? Yes No
New York City	6 months	If death of female under 50 a. Pregnancy in last 6 months? No, Yes b. If yes, outcome of pregnancy? 1. Live Birth 2. Spontaneous Termination 3. Induced Termination 0. None
New York (upstate)	6 months	a. If female, was decedent pregnant in last 6 months? Yes, No b. Date of delivery: (m/d/y)
North Dakota	18 months	Was decedent pregnant within 18 months of death? (Yes or No)
Texas	12 months	■ Was decedent pregnant at time of death? Yes No Unknown ■ Was decedent pregnant during the last 12 months? Yes No Unknown
Virginia	3 months	If female, was there a pregnancy in past 3 months? Yes No Unk

Appendix C

The Pregnancy-Related Portion of the Proposed U.S. Standard Certificate of Death

The proposed revision of the U.S. certificate of death will include the following:

37. IF FEMALE:

- Not pregnant within past year•
- Not pregnant, but pregnant within 42 days of death•
- Not pregnant, but pregnant 43 days to 1 year before death•
- Pregnant at the time of death•
- Unknown if pregnant within the past year•

Appendix D

State Review Provisions, ACOG 2000

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THE AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS

STATE REVIEW PROVISIONS

State Review Provisions

In this document, The American College of Obstetricians and Gynecologists updates its previous survey of state statutes and case law regarding legal protections for review activities. The statutory information and court decisions were compiled in 2000.

Although this analysis provides an overview of available protections, it is not intended to be an exhaustive analysis of the protections that may be available to every type of review. There are two important sources of protection for reviewers that are covered by this analysis. First, the research includes statutes protecting review committees. It addresses the laws which, in effect, give derivative immunity to those who contract with state agencies or work on state funded projects. These may be significant sources of protection to reviewers working outside the hospital setting. Second, we included analyses of court decisions interpreting immunity and confidentiality provisions.

It cannot be overemphasized that individuals with specific questions about the legal protections available for a given review activity should consult the laws in their state in order to understand the provisions that may applicable to their individual review project.

Alabama

Three provisions of the Code of Alabama that limit liability for peer review activities could apply to state-level infant and maternal review. Section 6-5-333 covers peer review committees, utilization and quality control committees, professional standards review committees, and similar committees established by any state or county medical association. A physician or an individual who serves as a member, consultant, or employee of the committee is not liable for damages as a result of actions taken or recommendations made by the committee in response to a requested review of medical care. This protection only applies if the action or recommendation was taken without malice and in a reasonable belief that the action is warranted by the facts. The statute also protects state and county medical associations from damages based on actions or recommendations taken by their committees.

Under this same section, all information, interviews, and reports furnished to the committee and any findings or recommendations made by the committee are privileged and are not available for court subpoena for discovery proceedings. The statute does not exempt from discovery preexisting records presented to the committee that would otherwise be subject to discovery.

Section 22-21-8 provides that materials concerning the accreditation or quality assurance of a hospital, clinic, or medical staff are confidential and are not subject to discovery or introduction into evidence in any civil action arising out of matters which are the subject of the review. Furthermore, persons involved in preparation, evaluation, or review of the materials shall not be permitted or required to testify in any such civil action. However, materials available from original sources may not be construed as privileged merely because they were presented in or used in the preparation of accreditation or quality assurance activities. Persons involved in preparation, evaluation or review of such materials may testify as to matters within his/her knowledge, but may not be asked about opinions or data he/she provided in preparation, evaluation, or review of accreditation, quality assurance or similar materials.

Section 34-24-58 of the Code protects from liability physicians and surgeons who are members of utilization or similar committees of any state, county, or municipal medical association, licensed hospital, clinic or medical staff thereof. The decisions made or actions taken by these committees are also privileged.

Alaska

Alaska Statutes Sections 18.23.010 to 18.23.070 limit liability for members of "review organizations" established by a hospital, clinic, state or local medical association or an organization of health care providers for the purpose of reducing morbidity or mortality. In addition, the statute also gives protection for a committee established by the commissioner of health and social services and approved by the State Medical Board to review public health issues regarding morbidity or mortality, where at least 75 percent of the members are health care providers.

A member, employee, or advisor to these review organizations is not liable for damages sought by the individual whose activities are being scrutinized, provided the member, employee, or advisor was not motivated by malice, and acted in the reasonable belief that the action was warranted after reasonable efforts were undertaken to ascertain the facts. The statute also protects any person providing information to a review organization from an action for damages unless the person knew or had reason to know that the information was false. Testimony, documents, proceedings, and other evidence before a review organization are confidential and not subject to subpoena or discovery. The statute also prevents any witness from being compelled to testify about matters occurring before the organization, with some exceptions. A health care provider may obtain testimony, documents, and other evidence of the review organization if the denial of the material is unreasonable. In addition, a plaintiff who claims that the person providing the information knew or had reason to know the information was false may obtain documents. Finally, a person whose conduct or competence has been reviewed may obtain information and documents for appellate review of the review organization's actions.

Arizona

Sections 36-2401 to 36-2404 of the Arizona Revised Statutes cover quality assurance committees of a health care entity, such as a professional organization of health care providers, that is investigating the quality of health care or encouraging proper utilization of health care services and facilities. These committees must have written standards and criteria on the quality assurance process. Committee members, individuals who furnish information to the committee, and the professional organizations operating the committee (such as a hospital or medical association) are not subject to liability for civil damages or any legal action so long as they acted without malice. The information considered by the committee and any records of its actions are confidential. This material is not subject to subpoena or discovery. Furthermore, no member or staff of a committee, or an individual furnishing information to a committee may be subpoenaed to testify if the subpoena is based solely on activities related to the quality assurance process.

Sections 36-445 to 36-445.03 require that hospitals and outpatient surgical centers have committees to review the institution’s professional practices for the purposes of reducing morbidity and mortality and the improvement of patient care. This statute contains similar immunity and confidentiality provisions to the ones described above.

The 1993 case, Yuma Regional Medical Center v. Superior Court in and for County of Yuma (175 Ariz. 72, 852 P. 2d. 1256, review denied) clarified what information used in peer review is privileged in a subsequent malpractice suit. Protected information included a list of those present at the peer review meeting and a list of the documents submitted to the committee. Patient medical records presented to the committee, hospital administrative or personnel records, information on whether a doctor's privileges were changed or whether there was disciplinary action, and information on the date and place of the meeting were not protected. Additionally, any other information available from sources outside the peer review process was discoverable. However the plaintiff, "was not entitled to engage in fishing expedition to ascertain what information was considered by peer review committee and where such information might reveal deliberative process of participants."

Arkansas

Arkansas Statutes Annotated Section 20-9-501 defines peer review committees as committees of a state or local professional association established to evaluate and improve the quality of health care. Members of committees are provided immunity from monetary liability and actions for damages for any act or proceeding taken without malice or fraud, under Section 20-9-502.

Proceedings and records are not subject to discovery or use as evidence, and no person is permitted or will be required to testify about committee matters, including the findings. These protections only extend to civil suits arising out of the matters which are at issue before the committee. Documents available from original sources are not immune from discovery simply because the committee saw them. Similarly, witnesses may testify about matters discussed before the committee if the witness had independent knowledge of those matters. This permission to testify does not extend to any opinion formed as a result of the committee meeting. Section 20-9-503.

In 1995, Section 16-46-105(a) of the Arkansas Code was amended to provide that records, testimony, and reports of organized committees of hospital medical staffs or medical review committees of local medical societies are not subject to discovery or admissible in any legal proceeding and is absolutely privileged communication. Testimony at such committee meetings is also not subject to discovery.

California

Section 1156 of the California Evidence Code provides that written records, interviews and reports of in-hospital medical staff committees organized for the purpose of reducing morbidity and mortality may not be admitted as evidence in any action before any administrative body, agency or person. This section does not affect the discoverability of documents that may be discovered from original sources, nor does it exclude evidence relevant in a criminal action.

Section 1157 of the California Evidence Code protects from discovery proceedings and records of organized hospital medical staff committees charged with evaluating and improving the quality of care rendered in the hospital, and of local medical society review committees similarly charged. No person attending a committee meeting can be required to testify about what transpired. However, these protections do not apply to statements made by a person in attendance at a committee meeting who is a party to an action or proceeding where the subject matter was reviewed at the meeting or to any individual requesting hospital staff privileges.

Section 43.7 of the California Civil Code provides that no monetary liability or cause of action for damages will arise from any act or proceeding undertaken by members of duly appointed committees of professional or medical specialty societies formed to maintain the professional standards of the society or its bylaws. A similar protection applies to members of peer review committees reviewing physicians and to members of hospital governing boards reviewing their medical staffs. In order for the immunity to attach, the professional society, committee, or board

member must have acted without malice, made a reasonable effort to obtain the facts, and acted in the reasonable belief that the action was warranted.

Under Section 43.8, persons providing information to a hospital, hospital medical staff, professional society or peer review committee are protected from monetary liability and causes of action for damages arising from the communication of information intended to help evaluate the qualifications of a practitioner.

Section 43.97 protects hospitals from monetary liability and causes of action for damages, other than economic or pecuniary damages, as a result of actions taken upon the recommendation of its medical staff.

Colorado

Under Colorado Revised Statutes section 12-35.5-203, a professional review body, its members or staff, persons under contract with the professional review body, or persons assisting the professional review body can not be liable for damages in civil actions with respect to their participation with the professional review body. This immunity applies only to professional review actions as defined by the statute. Persons providing information to professional review bodies are not protected if they knowingly provide false information.

Colorado Revised Statutes Sections 12-36.5-101 to 105, the Colorado Professional Review Act, cover professional review committees authorized to study and review professional conduct and the quality and appropriateness of patient care provided by physicians. Professional review committees and their members, entities establishing such committees, and their governing boards and individuals who participate in the proceedings are provided immunity in any civil or criminal action, including antitrust, brought by the physician being investigated. In order for this immunity to apply, the member of the review committee must have made a reasonable effort to obtain the facts, acted in the reasonable belief the action was warranted and acted in good faith. Entities that establish these committees, their governing boards, witnesses or other participants in the process must also act in good faith to receive the immunity protection.

Professional review committees may be established by many different groups, including hospital or hospital-related medical staffs, physician associations with membership of at least one-third of the state's physicians, and certain medical specialty societies. All matters, records, proceedings and formal recommendations related to a committee hearing are confidential.

The 1996 judicial decision Nicholas v. North Colorado Medical Center, Inc. v. Committee on Anticompetitive Conduct (914 P.2d 902) stated that the legislative purpose of the Colorado Professional Review Act was not only to provide immunity protections to persons involved in peer review proceedings, but also to protect the public's health and safety by regulating unprofessional and anticompetitive conduct.

Connecticut

Connecticut General Statutes Section 19a-17b covers medical review committees of a state or local professional society or health care institution engaged in peer review for the purpose of evaluating and improving the quality of health care or reducing morbidity or mortality. Members of these committees are protected against monetary liability and lawsuits for damages for any act or proceedings, provided that their actions or recommendations were taken without malice in the reasonable belief the action was warranted. Individuals providing testimony to these committees are also protected against monetary liability and lawsuits for damages.

The proceedings of medical review committees are not subject to discovery and may not be introduced as evidence in civil actions against the health care provider. In addition, no person in attendance at a meeting is permitted or required to testify in these civil actions. There are some restrictions on this prohibition. In any civil action, written documents recorded independently of the review process are discoverable and witnesses may testify regarding facts acquired independently of the review process. The fact that staff privileges were restricted or terminated may be disclosed; and the nature of any restriction of staff privileges may be disclosed. Finally, in health care provider proceedings, other than peer review, that concern termination or restriction of privileges, data discussed or developed during a peer review proceeding may be used.

Section 19a-25 protects information procured in studies of morbidity and mortality carried out by the Department of Public Health or staff committees of facilities accredited by the Department of Health. It provides that this information shall be confidential and shall be used solely for the purposes of scientific or medical research. Such information is not admissible as evidence in any court or before any other tribunal, board or agency. However, in some circumstances personal data collected during a morbidity or mortality may be disclosed to another governmental agency or private research organization for research purposes. This statute is not designed to prevent a physician from testifying, but rather to prevent him/her from disclosing confidential matters.

Delaware

Title 24 Section 1768 of the Delaware Statutes protects the Board of Medical Practice, the Medical Society of Delaware, their members or committee members, and members of hospital committees and other review organizations. These groups or individuals are immune from civil or criminal lawsuits, claims, or damages arising from any act, decision or recommendation made in a review, so long as the committee members acted in good faith and without malice. Physicians, hospitals or other organizations that furnish information or data to review committees are also protected from civil or criminal lawsuits.

The records and proceedings of these committees are confidential and are not subject to discovery or court subpoena. In addition, no person in attendance at a review may be required to testify as to what transpired. However, the provisions of this section do not apply to subpoenas issued by the Board of Medical Practice, under Title 24 Section 1731A(h), during investigations regarding physician competency or quality of care. Patient-identifying information must be

removed from peer review records disclosed to the Board of Medical Practice pursuant to a subpoena.

District of Columbia

Sections 32-501 to 505 of the District of Columbia Code cover any peer review body, member, or person acting as its staff or who assists such a body. Peer review in defined as, "the procedure by which health-care facilities and agencies, group practices, and health professional associations monitor, evaluate, and take actions to improve the delivery, quality, and efficiency of services within their respective facilities, agencies and professions...." Peer review bodies and their members or staff are not liable for damages or equitable relief by reason of conducting the peer review. The peer review must be within the scope of the review body's functions, and members must act in a reasonable manner. Individuals, health care facilities, health professional associations or group practices providing any report, information, opinion, or testimony are not liable for damages or equitable relief. This immunity does not apply if the person or entity providing the information knew it was false.

The files, records, findings and recommendations of a peer review body, information provided to or obtained by the body, and the identity of persons providing information to the body is confidential and neither discoverable nor admissible into evidence in any civil, criminal, legislative, or administrative proceeding. However, this protection is qualified. In criminal proceedings, a court may order the peer review body to provide information if it determines that disclosure is essential to protect the public interest, and the information can be obtained from no other source. Records available from original sources are also discoverable. Health professionals may admit into evidence the minutes and reports of a peer review body for the limited purpose of reviewing the appropriateness of the adverse action. Individuals who participated in or provided information to the peer review body may not be compelled to testify in matters relating to the peer review proceeding.

The 1995 case Jackson v. Scott (App. D.C., 667 A. 2d. 1365) confirmed that in order to be discoverable, materials contained in a peer review body's report must not owe their existence to the peer review investigation. The Court also ruled that testimony of persons who observed the events reviewed by a peer review committee and reported their observations to the committee could not testify about their statements to the committee in a medical malpractice case.

Florida

Florida Statutes Section 766.101 covers medical review committees of a hospital, ambulatory surgical center, health maintenance organization, state or local professional medical society, or hospital medical staff whose purpose is to evaluate and improve the quality of health care or to determine that services provided met the applicable standard of care. Members of a medical review committee, medical health care providers who furnish information, witnesses, and committee investigators are immune from monetary liability and causes of action. This protection only applies if the committee member or health care provider acts without intentional fraud.

Investigations, proceedings, and records of a medical review committee are not subject to discovery or introduction into evidence in any civil action against a health care provider for matters which are the subject of the investigation. Individuals attending medical review committee meetings may not testify in any civil action as to any evidence including the findings, recommendations or opinions of the committee. However, documents or records otherwise available from original sources are not immune from discovery in a civil action merely because they were presented in medical review committee proceedings. Persons who testified before the review committee or were members of the committee may testify in civil actions regarding matters within their knowledge but cannot be asked about their testimony to the committee or their opinions formed as a result of the committee's hearings.

Under section 395.0193, health care facilities must provide for peer review aimed at reducing morbidity and mortality and improving patient care as a condition of licensure. The statute outlines peer review requirements. It also provides that members of the peer review panel may not be subject to a civil action for damages, nor may they be held monetarily liable for an action taken without intentional fraud.

Four recent cases clarify the protections provided to peer review proceedings. Munroe Regional Medical Center v. Rountree (721 So. 2d. 1220, 1998) reaffirms the confidentiality provisions of section 766.101, but also states that information available from original sources other than the peer review committee proceedings does not become privileged simply because it was presented to the review committee. Furthermore, the decision allowed a witnesses to testify about what he/she saw or heard during surgery; but the witness could not testify regarding what he/she told a peer review committee about the surgery.

In Columbia Park Medical Center v. Gibbs (728 So. 2d. 373, 1999) and Ordna Healthcorp v. Berghof (722 So. 2d. 961), the court ruled that physicians' applications for staff privileges, documents outlining them and applications for malpractice insurance were protected from disclosure under Florida's peer review protection statute.

Finally, the 1999 decision Joseph L. Riley Anesthesia Associates, P.A. v. Karstetter (729 So. 2d. 517) provided that a physician who was a member of a peer review committee that evaluated a medical malpractice incident could not testify as a expert witness in a malpractice action regarding the same incident.

Georgia

Georgia Code Sections 31-7-131 to 133 cover review organizations primarily composed of professional health care providers engaged in peer review to evaluate and improve the quality of care, reduce morbidity or mortality, or evaluate claims against health care providers. Professional health care provider is defined broadly and includes a corporation operating a hospital or health care facility, as well as the officers, directors, or employees of the organization performing peer review. Professional health care providers, members or employees of health care providers or peer review organizations have criminal and civil immunity for peer review activities. This immunity does not apply if the person was motivated by malice in conducting the

peer review activity. Witnesses and other individuals providing information to a review organization are similarly protected, unless the person providing the information knew it was false.

The proceedings and records of a review organization are not subject to discovery or introduction into evidence in any civil action. Individuals attending a review organization's meeting cannot testify in a civil action as to matters presented or any findings, recommendations, evaluations, opinions, or other actions of the review organization. Documents or records available from original sources are not covered under this protection. Furthermore, individuals who participated in the peer review may testify as to matters within their personal knowledge.

Sections 31-7-140 to 143 of the Georgia Code provide parallel protections for medical review committees. A medical review committee is defined as a committee of the state or local professional society or of a medical staff, hospital, or a peer review committee, which operates according to written bylaws to evaluate and improve the quality of care, or determine that services provided meet the standard of care.

In the 1998 decision, Fulton-DeKalb Hospital Authority v. Dawson (509 S.E.2d. 28) the court ruled that the peer review immunity statute "does not provide an absolute shield of immunity" protecting utilization review providers from the consequences of their administrative acts.

Hawaii

Section 624-25.5 of the Hawaii Revised Statutes establishes confidentiality protection for peer review committees. Proceedings and records of peer review and quality assurance committees are not subject to discovery. However, original sources of information such as incident reports or occurrence reports are discoverable. No person in attendance at a meeting can be required to testify as to what transpired at the meeting. This prohibition does not apply to individuals who are a party to an action the subject matter of which was reviewed at the meeting or to any person requesting hospital staff privileges.

Section 663-1.7 of the Hawaii Revised Statutes covers peer review committees created by a professional society, hospital, or clinic staff to maintain professional standards established in the organization's bylaws. It also covers hospital or clinic quality assurance committees. Committee members and individuals who file complaints or appear as witnesses before these committees are immune from civil liability, as long as they acted without malice. Individuals who provide information at committee meetings are also immune from civil liability unless the person knew the information provided was false. Professional societies, hospitals, and clinics are generally not immune from liability, except for communicating any conclusion reached by their peer review or quality assurance committees to a similar organization, or to a governmental agency or board.

Last, sections 671D-4 to 671D-11 cover professional review actions taken by a professional review body, as defined by the statute. Under these sections, the professional review body, its members and staff, and persons assisting the body with respect to a professional review action

may not be held liable for damages. There are exceptions to this provision for antitrust cases brought by the state and civil rights cases. Witnesses to the professional review body are not protected if they knowingly provide false information. Finally, professional review actions must be taken with the reasonable belief that the action would improve the quality of health care, after the physician involved was provided reasonable notice, and with the reasonable belief that the action was warranted by the facts. Actions that do not meet these basic standards are not protected.

Idaho

Idaho Code Sections 39-1392a to 1392f require hospitals have in-hospital medical staff committees which review the care provided by the medical staff for the purpose of reducing morbidity and mortality. The furnishing of information to medical staff committees or medical society committees or the subsequent use of this information by these committees will not subject any person, hospital, or agency to any liability or action for monetary damages or other legal or equitable relief. Persons knowledgeable about information presented to a committee may not disclose this information except as authorized by the Idaho State Board of Medicine, or for the sake of determining hospital privileges. All written records and all reports related to a committee hearing are the property of the hospital or medical society. This provision does not alter a patient's right to access to his/her hospital chart.

All written records of interviews, all reports, statements, minutes, memoranda, and physical materials relating to the review of any in-hospital medical staff or medical society committees are confidential and privileged. They are not subject to subpoena or discovery proceedings.

The statute also provides for certain exceptions to the privilege and confidentiality protections. In a civil action against a physician or a hospital in a matter related to an investigation or review, the hospital or medical society can, under certain circumstances, disclose the action the committee took and the names and addresses of persons who have direct knowledge of the care provided.

Illinois

Section 85/10.2 of Title 210 of the Illinois Compiled Statutes provides that no hospital or individual who is a member, agent, or employee of the hospital, its medical or administrative staff, or the hospital board shall be liable for civil damages as a result of peer review activities, quality review, morbidity or mortality studies, or professional discipline activities. There is an exception to this immunity if the challenged review activities constitute "willful and wanton misconduct."

Illinois Compiled Statutes at 225 ILCS 60/5 provides immunity to persons serving on committees whose purpose is internal quality control to reduce morbidity and mortality or improve patient care. These committees may be organized by a hospital or a professional association. Any person serving on such committee or providing service to such committee may not be liable for civil damages as a result of acts, omissions, or decisions of the committee. The

immunity does not apply to acts involving willful or wanton misconduct. People furnishing information to these committees are also protected from any action for damages or other relief.

Under 735 Illinois Compiled Statute 5/8-2101, information, interviews, reports, statements, memoranda, or other data of these committees are privileged and can be used only for statutorily specified purposes including medical research, evaluation, and improvement of quality care. Such information is not admissible as evidence or discoverable in any action. The claim of confidentiality, however, cannot be used to deny a physician in a state privileging action access or use of data upon which a privileging decision was based.

Two 1998 cases clarify these confidentiality and privilege provisions. In Doe v. Illinois Masonic Medical Center (705 NE 2d. 436), the court confirmed that promoting peer review is not the only purpose of the Medical Studies Act; it exempts documents used by hospitals and other providers in the course of research from disclosure as well. Thus, the hospital's institutional review board was a committee and documents relating to the experimental pre-implantation genetic testing procedure used by the hospital to reduce the incidence of cystic fibrosis were protected from discovery in a malpractice case. In Chicago Trust Company v. Cook County Hospital (698 N.E. 2d. 641), the court ruled that documents created by a hospital in response to an accidental patient discharge were discoverable because the documents were not created, prepared, or generated by the hospital's oversight committee.

Indiana

Sections 34-30-15-1 through 34-30-15-21, Indiana Code Annotated, provide immunity and confidentiality protections for peer review committees. Peer review committees are defined in section 34-6-2-99 to include committees organized by a state or local organization of health care providers, or the governing board or professional staff of a health care facility. Peer review committees, as defined in the statute, evaluate the qualifications of health care providers, patient care rendered by health care providers, and the merits of complaints against health care providers. All communications to a peer review committee are privileged and proceedings of a peer review committee are confidential. Peer review committee personnel and participants are not allowed to reveal any communication, records, or determination of a peer review committee. However, the governing board of a hospital or professional health care organization may disclose the final action taken with regard to a health care provider. No person in attendance at a peer review may disclose any information acquired during the course of a proceeding. Furthermore, records or determinations of a peer review committee are not subject to subpoena or discovery, nor are they admissible as evidence, except in certain cases. Information discoverable from original sources is not immune from discovery. A professional health care provider, a peer review committee, a governing board of a hospital or other professional health care organization may use information obtained by a peer review committee for legitimate internal business purposes, including reduction of morbidity and mortality.

Peer review committee personnel are protected from liability for any act, statement, or proceeding made in good faith in regard to evaluation of patient care. Personnel of a peer review committee are also immune from civil actions arising from any determination made in good faith.

In addition, the immunity protection applies to a peer review committee, an organization, or any person who, in good faith furnishes records, information or assistance to a peer review committee, unless the person knowingly furnishes false records or information.

Iowa

Iowa Code Sections 135.40 to 135.42 specifically apply to morbidity and mortality studies conducted by the Iowa Medical Society or any of its allied medical societies, or any in-hospital staff committee.

Persons, hospitals, or other organizations that provide information, reports, interviews or other data for such studies are provided immunity from civil liability. This same protection also applies to any person or group which releases or publishes the findings and conclusions of such studies. The findings of morbidity and mortality studies may only be used or published for the purpose of advancing medical research or education, except that a summary may be released for general publication. All information, interviews, reports, statements, memoranda, data, findings and conclusions from these studies are not to be used, offered or received in evidence in any legal proceedings. The Code does not exempt from discovery primary medical or hospital records.

Iowa also has more general peer review statutory protection. Section 147.135 provides immunity to individuals from civil liability arising in connection with service on a peer review committee, providing information to such a committee, or filing a complaint with one. Peer review records are privileged and confidential and not subject to discovery or admissible in evidence, with some exceptions. A person present at a peer review committee meeting may not testify about the proceeding, other than a license disciplinary action or action brought by a licensee who was the subject of the review and whose competence is at issue.

Kansas

Sections 65-177 to 65-179 of the Kansas Statutes Annotated allow the secretary of health and environment to conduct medical research studies for the purpose of reducing morbidity or mortality from maternal, perinatal, and anesthetic causes. These studies can be conducted by the secretary's staff or other qualified persons, agencies or organizations. All data provided for these studies must be treated as confidential and be used only for the purpose of medical research. The research files, and opinions expressed about the data are inadmissible as evidence, but statistical findings of the study are admissible. Also, this section does not affect a patient's right to access his/her medical record or to have the record entered into evidence. The statute prohibits interviews with patients named in a report or their relatives, but authorizes the publication of final reports or statistical compilations so long as the names of individuals and institutions are not identified. Physicians, hospitals or other persons who furnish data for these research studies are not subject to any action for damages or other relief. There is no explicit grant of immunity to members of a committee involved in such a study.

Section 65-4915 protects peer review committees, which include committees of state or local professional associations, organized medical staff, or health maintenance organizations that

function to evaluate and improve quality of health care or to reduce morbidity or mortality. Reports, statements, records, proceedings, and findings of these peer review committees are privileged and are not subject to discovery or subpoena and are inadmissible as evidence in any proceeding. Information contained in these records is also not discoverable in the form of testimony by an individual who participated in the peer review process. These protections do not apply to licensing or disciplinary proceedings of a health care provider.

Sections 65-4909 and 65-442 provide immunity to these same individuals and organizations for performance of their functions, provided they acted in good faith and without malice.

Kentucky

Section 311.377 of the Kentucky Revised Statutes Annotated protects members, participants, or employees of committees of any licensed hospital, health maintenance organization, organized medical staff, medical society, or designated affiliated medical association for good faith actions in reviewing and evaluating the competency of conduct of other health care personnel. The proceedings, records, opinions, conclusions, and recommendations of any committee, medical staff, or other entity are confidential and privileged. Furthermore, they are not subject to discovery, subpoena, or introduction into evidence in any civil action or in any administrative proceeding. The statute does not restrict from discovery any evidence, document, or record which is subject to independent discovery. No person will be permitted or compelled to testify concerning his/her testimony or the testimony of others except that a defendant in a lawsuit may testify about such matters. Testimony and records related to the review may be presented in a statutory or administrative proceeding related to the duties of the review entity.

Louisiana

Louisiana Revised Statutes Section 13:3715.3 provides immunity from damages for peer review committees, committee members, and organizations sponsoring these committees. This immunity applies as long as the action or recommendation was made without malice and in the reasonable belief that the action or recommendation is warranted by the facts. Employees, physicians, hospitals, organizations, or institutions furnishing information, data, reports, or records to any of these committees are not liable in damages for providing information. All records, notes, data, studies, analyses, exhibits, and proceedings of the committee are confidential. They are not available for discovery or court subpoena except in lawsuits brought by a physician for termination of staff privileges. Records or documents which are otherwise discoverable from original sources are discoverable.

Two cases have further clarified the qualified immunity given to review committee members. In the 1994 case Smith v Our Lady of the Lake Hospital, Inc. (639 So. 2d. 730), the court found that qualified immunity protects committee members from liability on damages only, not from litigation in general. Furthermore, qualified immunity protects individuals not entities. The surgeon involved in the case, who sought to reinstate his hospital privileges, was allowed to sue the hospital for injunctive relief.

Also Smith v. Our Lady of the Lake Hospital, Inc. confirmed that peer review actions must be taken without malice in order for qualified immunity to apply. However, the court determined that a competitor's participation in peer review alone was not enough to infer malice. Also, the fact that the medical review was carried out by a professional society committee rather than an internal committee of the surgeon's peers did not add up to malice.

Finally, in the 1998 case Zamanian v. Christian Health Ministry (715 So. 2d. 57), the "good faith" requirement for qualified immunity was interpreted to mean that committee members had reasonable grounds for believing that a statement is correct, but did not require ultimate proof that the statement was true. Moreover, mere allegations of bad faith were not enough to refute qualified immunity without further evidence of personal animosity.

Maine

Title 24, Maine Revised Statutes Sections 2502, 2510-A, 2510-B, and 2511 protect professional competence committees (as defined by the statute) whose study and actions aim to maintain and improve the quality of care rendered by a health care entity or physician, reduce morbidity and mortality, or establish and enforce professional standards. Members of professional competence committees or professional review committees are immune from civil liability as long as their actions are taken without malice.

Title 32, Maine Revised Statutes Sections 2599, 3293 and 3296 contain provisions relevant for review committees. A physician licensed in Maine who is a member of a medical review, peer review, or disciplinary committee is immune from civil liability for undertaking or failing to undertake an act. The committee must be established either as a requirement of accreditation by the Joint Commission on Accreditation of Hospitals, by a state or county professional society, or the Board of Licensure in Medicine. All proceedings and records of proceedings of medical staff review committees are confidential and exempt from discovery.

Records of professional competence committees are privileged and confidential. With limited exceptions, they cannot be subject to subpoena or admitted as evidence in any civil, judicial or administrative proceeding. Professional competence review records may be used in a proceeding in which a physician contests a professional competence review action taken against him/her, or in an action in which the review committee uses the documents in its own defense. Furthermore, a professional competence committee may furnish records to other professional review bodies, the physician who is the subject of the review, and his/her attorney, agents or representatives. Last, professional competence committees may release a physician’s professional status information .

In the 1996 case Benjamin v. Aroostook Medical Center (937 F. Supp. 957), the court interpreted this immunity provision as protecting members of professional competence committees for liability for any report of information made available to a licensure board. Members were determined to be shielded not only from claims for damages but from any suit. The same decision further defined “malice” as “actual malice” or ill will, or “implied malice”—“reckless disregard for the truth or falsity of slanderous element of statement.”

Maryland

Sections 14-501 to 14-504, Maryland Health Occupations Code Annotated, protect medical review committees that function to evaluate and improve the quality of health care or to discipline health care providers. Members of a medical review committee acting in good faith or persons who furnish information to or participate in a medical review committee are immune from civil suit.

Proceedings, records, and files of a medical review committee are confidential and are not discoverable or admissible as evidence in any civil action arising out of matters that are being reviewed and evaluated by the committee. This protection does not apply to documents otherwise subject to discovery, or to civil actions brought by a party to a review committee proceeding who claims to be aggrieved by a decision of the review committee.

During the 2000 legislative session, the Maryland Legislature added Maryland Health General Code Sections 13-1001 to 13-1007. This section establishes a Maternal Child Health Committee to review cases of maternal deaths and issue recommendations for the prevention of maternal mortality. This committee is considered a medical review committee and is entitled to the protections provided for under section 14-501 of the Health Occupations Code.

Massachusetts

Massachusetts Annotated Laws Chapter 231, Section 85N protects members of a professional society or an appointed committee thereof, or members of a committee of a hospital medical staff or a health maintenance organization from civil liability as a result of acts, omissions, or proceedings of such committees, as long as they acted in good faith. Such members are also protected from liability for acts, omissions, or proceedings performed within the scope of their duties for a nonprofit corporation, the sole voting member of which is a physicians' professional society. Peer review records may be discovered and testimony of witnesses present at the committee proceedings may be used in actions pursuant to Chapter 231, Section 85N. In such cases, neither the witness nor members of a committee may be questioned regarding the witness' testimony before the committee or the identity of any person furnishing information or opinions to the committee.

Section 1 of Chapter 111 defines a medical peer review committee as a committee of a state or local professional society of health care providers, or of a medical staff of a hospital or health maintenance organization established for the purpose of evaluating or improving the quality of health care services. Confidentiality of the proceedings, reports, and records of a medical peer review committee are protected by Chapter 111, Section 204 from subpoena, discovery, or introduction into evidence in any judicial or administrative proceeding, except for proceedings conducted by the board of registration in medicine. Also under Chapter 111, Section 204, no person who was in attendance at a medical review committee meeting is permitted or required to testify in any judicial or administrative proceeding, other than a proceeding before a board of registration, regarding the proceedings or findings of the committee. However, documents available from original sources are not immune from discovery simply because they were

presented in a medical review proceeding. Witnesses may testify to matters known independent of the committee's proceedings.

In 1998, a Massachusetts court ruled that hospital incident reports were a necessary byproduct of a medical review committee's work and thus were shielded from discovery. (Carr v. Howard 689 N.E. 2d. 1304)

Michigan

Section 331.531, Michigan Compiled Laws, offers protection from civil or criminal liability to persons, organizations, or entities acting as a review entity. Persons, organizations, or entities are also offered immunity for providing information or data to a review entity. These protections do not apply if the persons, organizations, or entities acted with malice. A review entity is defined, in part, as a duly appointed peer review committee of a state or county association of health care professionals, a health care facility, or a health care association. Section 331.532 authorizes the publication of the committee's findings or proceedings for the limited purposes of advancing health care research or health care education, maintaining the standards of the health care professions, or disciplining a health care provider. Section 331.533 requires that a review entity remove a patient's name and address from the record before releasing its findings or proceedings. Also, under this section, an entity's findings and proceedings are considered confidential and are not discoverable and are not to be used as evidence in any civil action or administrative proceeding.

Section 333.21513 requires hospitals to organize their medical staff for the purpose of enabling effective peer review to reduce morbidity and mortality and improve care. Under section, 333.21515, the records, data and knowledge collected by individuals and committees conducting peer review are confidential and are not available for court subpoena.

Minnesota

Minnesota Statutes Sections 145.61 to 145.67 cover review organizations including a committee of a hospital, clinic, state or local professional association, or a health maintenance organization. These committees must have a purpose described in the statute. Covered committees include, among others, those established to reduce morbidity or mortality, develop or review professional standards, or determine whether action should be taken against a professional's staff privileges or professional association membership. Review organizations and their members and employees are not liable for damages or other relief for their review activities or recommendations unless they were motivated by malice. This protection also applies to a person, firm, or corporation which provides information to a review organization, unless the person knew or had reason to believe the information was false.

All data and information acquired by a review organization is confidential except to the extent necessary to carry out the purpose of the review. The proceedings and records are not subject to discovery or introduction into evidence in any civil action against a professional arising out of the matter which is the subject of review. This information is protected from subpoena and

discovery, except for professionals seeking data relating to their medical staff privileges. Documents or records from original sources are not immune from discovery. Also, no person shall disclose what transpired in a review meeting. An exception is made for disclosures necessary to further the committee's purpose. Persons who were members of or witnesses to the review committee may testify in other actions provided that they are not questioned about their testimony before the committee or opinions formed as a result of the proceedings.

Some recent cases clarify these immunity and confidentiality provisions. Doctor's Medical Clinic v. Jackson (581 N.W. 2d. 30, 1998) established that a hospital and members of its review committee were immune from liability for equitable relief in an action where a physician challenged the revocation of his privileges.

In re: Fairview University Medical Center (590 N.W. 2d. 150, 1999) reaffirmed the confidentiality protections granted to review organization documents, ruling that confidentiality applies to all documents in peer review organization files—including those from other sources. The court further ruled that the Board of Medical Practice complaint committee could not subpoena a review organization's records because it did not qualify for the exception to confidentiality provided to disclosures necessary to carry out functions of the review organization.

Mississippi

Mississippi Code Annotated Sections 41-63-1 to 41-63-9 apply to medical review committees of a hospital, state or local medical society, health maintenance organization or other health care facility established to evaluate and improve the quality of health care services or the competence of health care practitioners. Hospitals, review committees, and their members are not liable in damages for any action or recommendation taken by the committee if they act without malice. Physicians, nurses, hospitals, and other institutions who provide medical information to the committee are also immune from liability.

The proceedings and records of any medical review committee are confidential and are not subject to discovery or introduction into evidence in lawsuits arising out of matters which are the subject of evaluation and review by the committee. These protections do not apply in any legal action brought by a medical review committee to restrict or revoke a physician’s license to practice medicine or hospital staff privileges, or for review actions alleged to be malicious. In addition, records from original sources are admissible. Persons attending a committee meeting may not be permitted or required to testify about committee findings or other committee matters. This provision does not prohibit witnesses or committee members from testifying about other matters within their knowledge as long as they are not questioned about their testimony to the committee or their opinions formed as a result of the committee proceedings. These provisions limiting discovery do not apply to legal actions brought by a committee to restrict or revoke a physician's privileges, nor do they apply to legal actions brought by aggrieved physicians against a committee member in which malice is alleged.

Sections 41-63-23 through 41-63-29 also provide protections from discovery or introduction into evidence for accreditation and quality assurance materials of health care organizations. Persons

involved in the preparation, evaluation or review of these materials are not permitted nor can they be required to testify in any civil action as to any evidence, findings, or recommendations. Information or records from original sources are admissible. These provisions do not apply in any legal action brought by a health care entity to restrict or revoke a physician's license to practice medicine or hospital staff privileges, or for review actions alleged to be malicious.

A 1998 case Claypool v. Mladineo (724 So. 2d. 373) further defined the limits on privilege for granted to peer review committees. The court stated that generally records and transcripts of peer review proceedings were confidential, but that confidentiality did not apply to otherwise discoverable material. Furthermore, the plaintiff in the case was entitled to review committee documentation that would tell him where to find this otherwise discoverable information. Also, persons present at the committee meeting could testify regarding matters not specifically prohibited by the statute; and the review committee was obligated to provide the plaintiff with names and addresses of those in attendance at the committee meetings in order to schedule depositions of those persons.

Missouri

Revised Statutes of Missouri Section 537.035 covers peer review committees appointed by a state, county, or local society of health care professionals, the medical staff of a hospital or other health facility to evaluate or monitor the quality of health care services. Each committee member, person, and hospital governing board who participates in the operation of a peer review committee is immune from civil liability for acts performed in good faith without malice within the reasonable scope of committee inquiry. This protection also applies to those who testify before or provide information to the committee.

The proceedings, findings, deliberations, reports, and minutes of the committee are not subject to discovery or subpoena nor are they admissible into evidence in any judicial or administrative action for failure to provide appropriate care. Information otherwise discoverable or admissible from original sources is not covered by these prohibitions. The provisions limiting discovery also do not apply in any judicial or administrative action brought by a peer review committee to deny, revoke, or restrict staff privileges or license, or when the committee is sued for carrying out its responsibilities. No person attending a peer review proceeding may testify about committee matters. But, member, agent, employee or witness to the committee may testify regarding matters within his/her knowledge as long as he/she is not questioned regarding his/her testimony to the committee or opinions formed as a result of the committee proceeding.

In Health Midwest Development Group, Inc. v. Daugherty (965 S.W. 2d. 841, Supp. 1998) physician-patient privilege did not preclude discovery of hospital peer review committee records in a physician's action against a hospital contesting the restriction of his staff privileges. However, identifying information must be removed from patient records.

In Dixon v. Darnold (939 S.W. 2d. 66) the court ruled that a party opposing discovery of peer review records based on the privilege provisions of the statute must show how discovery of the documents violates peer review privilege. A simple assertion of privilege is not sufficient.

Montana

Section 37-2-201 of the Montana Code immunizes members of peer review committees or professional standards review committees of a health care professional society from civil suit, if they act without malice and in the reasonable belief that their actions or recommendations are warranted. The proceedings and records of such a committee are not subject to discovery or use as evidence in any proceeding. However, documents available from original sources are discoverable. Persons present at a committee meeting cannot be questioned about committee proceedings, although such a person may testify about matters they learned about apart from the meeting. Immunity is extended to those in a nonprofit corporation engaged in peer review, medical ethics review, or professional standards review. Section 37-3-404 provides immunity to those who provide information to the state board of medical examiners as required by 37-3-401, 37-3-402, or 37-3-403.

Section 50-16-102 gives immunity to anyone giving information relating to infant morbidity and mortality to the state health department, a medical association, or hospital or medical society committee, or a nationally organized medical society or research group. The identity of persons who are the subject of mortality studies is confidential, and infant mortality data and studies may not be used in legal proceedings.

Sections 50-16-201 to 50-16-205 grant access to hospital records to medical staff committees organized to reduce morbidity and mortality. Committee data and records are privileged and confidential, and are not admissible as evidence in any judicial proceeding. Committee data and records may be published only for the purpose of evaluating medical care, therapy and treatment for research or statistical purposes. The committee may not disclose the identity of any patient whose records have been studied. These confidentiality provisions do not limit the discoverability of patient hospital records.

Nebraska

Section 25-12,121 of the Revised Statutes of Nebraska gives immunity to hospital medical staff committees, their members and agents, for action for damages if such an action is related to a committee recommendation concerning hospitalization or confinement in an extended care facility. In addition, peer review proceedings and records of a state or local health professional association are confidential, and the records and proceedings are not subject to discovery or admissible in evidence, under Section 25-12,123; however, records otherwise available from original sources are not immune from discovery or use in a civil action merely because they were presented during committee proceedings. This section also applies to health practitioner peer review committees of state or local health care professional societies. No committee member or witness may testify about his or her testimony before the committee or about committee opinions, but may testify as to matters within his/her knowledge. A court may, however, order disclosure of such committee proceedings, minutes, records, reports, or communications for good cause.

Immunity for peer review committee members is based on Section 71-147.01. It protects members of peer review committees of state or local professional associations from liability, if they act without malice and in the reasonable belief that such action or recommendation is warranted by the facts known to them. Nebraska law gives particular protection to morbidity and mortality proceedings. Sections 71-3401 to 3403 deal with studies conducted by the Nebraska State Medical Association or the Department of Health to reduce morbidity and mortality. The statute immunizes from civil suits any person providing information for such a study or releasing the findings of such a study to advance medical research or education. The identity of patients must be kept confidential. None of the information, interviews, reports, statements, or memoranda furnished for the study, and none of the study findings, can be introduced as evidence in any legal proceeding, unless confidentiality is waived by the interested parties.

Section 71-7903 provides that information and communications originating in peer review committees are privileged communications and are not discoverable unless the privilege is waived by the patient and a court orders the disclosure of such proceedings or communications. Privilege does not extend to medical records kept with respect to a patient in the ordinary course of business of operating a clinic, organization, or association of practitioners or providers, or to production of evidence relating to the treatment of any patient in the ordinary treatment course.

Nevada

Sections 49.117 through 49.123 of the Nevada Revised Statutes protect review committees. Review committees are defined as committees organized by a hospital, other medical facility or a medical society to evaluate and improve the quality of care. Review committees may refuse to disclose their proceedings, records and testimony presented before them. Any member of the committee, person whose work was reviewed by the committee or witness to the committee may claim this privilege. With limited exceptions, this privilege is presumed unless all parties entitled to claim privilege sign a written waiver of privilege.

Section 49.265 of the Nevada Revised Statutes further exempts from discovery the proceedings and records of review committees of medical societies. A person attending a committee meeting may not be compelled to testify concerning the proceedings. However, statements of persons who are parties to a later lawsuit relating to the committee's action are subject to discovery, as are statements made by any person requesting staff privileges at a hospital. There are no statutory immunity protections for peer review activities related to quality of care or morbidity or mortality reviews.

A 1997 case limited the types of documents immune from discovery. In Columbia/HCA Healthcare Corp. v. Eighth Judicial District Court ex. rel. County of Clark (936 P.2d. 844) the court ruled that hospital occurrence reports, which were factual reports about an incident, contained the type of information that would be obtained through traditional discovery. Therefore, if a plaintiff could not obtain the information contained in the occurrence report from other sources, the plaintiff should be denied access to the occurrence report.

New Hampshire

Members of professional standards review committees are afforded immunity for good faith actions taken by the committee. For physicians and nurses this includes committees organized by a state or federal agency, or a society or association affiliated with the American Medical Association, the American Nurses Association, or the Medical Care Foundation. Section 507:8-C, New Hampshire Revised Statutes.

Under Section 151:13-a of the New Hampshire Revised Statutes, hospitals, trustees, medical staff members, employees, and attendees at a hospital committee reviewing matters related to care and treatment or to morbidity or mortality cannot be held liable for providing information to the committee, and the committee records are privileged and confidential and not discoverable or admissible into evidence, except in the case of a legal action brought by a quality assurance committee to revoke or restrict a physician's license or hospital staff privileges, or in a proceeding alleging repetitive malicious action and personal injury brought against a physician, then a committee's records shall be discoverable. The hospital board of directors or trustees may waive this privilege and release information in conjunction with an administrative or judicial proceeding. Since a hospital's governing board may waive the privilege, negative implication is that no one else may do so.

Section 329:29 provides confidentiality protection to records, proceedings, findings and deliberations of medical review committees of county or state medical societies or committees of the board of registration in medicine. The records are not discoverable or admissible as evidence in a legal proceeding. A medical review committee may provide information to a hospital review committee, including a hospital morbidity and mortality committee, subject to the privileges and immunities set forth in 151:13-a.

In Smith v. Alice Peck Day Memorial Hospital, 148 F.R.D. 51 (D.N.H. 1993), quality assurance privilege was inapplicable in litigation challenging the hospital's revocation of a physician's staff privileges. The ordinary record of a patient's treatment remains admissible into evidence, even though a hospital QA committee may have studied the record and issued a privileged report based on data from the treatment record. In re "K" (1989) 132 NH 4, 561 A2d 1063.

New Jersey

Sections 2A:84A-22.8 and 2A:84A-22.9 of the New Jersey Statutes protect utilization review committees of hospitals or extended care facilities. They provide immunity for committee members and limited confidentiality for committee information.

Under Section 2A:84A-22.10 members, staff or consultants of a hospital review committee or local, county or state medical society whose function is to improve the quality of health care are immune from liability for their recommendations or actions made within the scope of the review, as long as they act without malice.

Section 26:1A-37.2 establishes confidentiality protection for information held by the Department of Health and procured in connection with research studies approved by the Public Health Council for the purpose of reducing morbidity and mortality. Such information may not be disclosed to anyone not participating in the study, unless patient-identifying information is removed.

New Mexico

Sections 41-9-2 to 41-9-6 of the New Mexico Statutes provide immunity to organizations of health care providers established by state or local associations to gather patient care information for the purpose of improving the quality of care, reducing morbidity and mortality, obtaining or disseminating statistics and information about treatment or prevention, and other miscellaneous purposes. Persons providing information to the organization are immune from a lawsuit unless they have reason to know that the information is false. Organization members, employees, and advisors are immune from a lawsuit if they act without malice and in the reasonable belief that their actions are warranted.

The information acquired by a protected organization shall not be disclosed except to the extent necessary to carry out the organization's purpose or in a judicial appeal of an action by the organization. However, records otherwise available from original sources are not immune from discovery or use in a civil action. Committee members may not disclose what happened at any meeting except where necessary to further organization purposes. Members of and witnesses to the organization may testify regarding matters within their knowledge as long as they are not asked about opinions formed as a result of the organization's hearing.

The 1998 case, Giron v. Corrections Corporation of America (14 F. Supp. 2d. 1245) established that records relating to a mortality and morbidity review are confidential and not discoverable in a medical malpractice action.

New York

Section 6527 of the Education Law covers hospital review committees, committees of a local, county, or state medical society with the responsibility of evaluating and improving the quality of health care, as well as the society itself or an individual performing a quality assurance review function. Members of the committee cannot be held liable for any committee-related recommendation or action, if they act without malice and in the reasonable belief that the act or recommendation was warranted, based on the disclosed facts. Similar immunity is afforded to individuals and entities providing information or recommendations concerning the qualifications, conduct, or practice of a physician to a government agency, medical society, or hospital.

The proceedings and records relating to the committee's review are not subject to discovery, and persons attending a committee meeting may not be required to testify about the meeting. An exception to this prohibition is made for statements of a person attending a meeting who is later party to a lawsuit, the subject matter of which was reviewed at the meeting.

Section 206(1)(j) of the New York State Public Health Law provides immunity to the health commissioner and designees conducting morbidity/mortality and quality improvement in medical care audits. No information is admissible as evidence in any action in any court and is confidential.

Section 2805-j of the New York State Public Health Law establishes medical, dental and podiatric malpractice prevention programs and quality assurance committees for their oversight. Persons who provide information to the program or participate in the quality assurance committee are immune, as are hospitals and persons acting on behalf of the hospital who take or do not take action as a result of a review, provided that nothing shall relieve any hospital of liability in an action for malpractice based on an act or failure to act as a result of a review conducted. Section 2805-m provides for confidentiality of records, documentation, or committee actions. No person in attendance at committee meetings shall be required to testify as to what transpired at the meeting. Prohibition relating to discovery of testimony does not apply to statements made by any person in attendance of meetings who is a party to an action or proceeding, the subject matter of which was reviewed at the meeting.

North Carolina

North Carolina law protects medical review committees of a hospital or appointed by a state or local professional society, or a committee of a peer review corporation or organization for the purpose of evaluating the quality of health care, cost of, or necessity for hospitalization, and medical staff credentialing. Section 131E-95 of the General Statutes of North Carolina grants immunity to committee members for actions taken without malice or fraud. It also protects committee proceedings and records and materials considered or produced during the review from discovery or introduction into evidence in civil suits resulting from matters that are the subject of evaluation and review. No person can be required to testify about the matters presented to the committee or its findings, recommendations, evaluations, opinions, or other actions. However, information, documents, or records otherwise available from original sources are not protected from discovery. A member of the committee or person who testifies before the committee may testify in a civil action, but cannot be asked about his testimony before the committee or opinions formed as a result of the committee hearings. Information that is confidential and not subject to discovery or use in civil actions as outlined above may be released to a professional standards review organization performing accreditation or certification functions. This type of information is limited to what is reasonably necessary and relevant to the standards review organization's determination to grant or continue accreditation or certification. The information released retains its confidentiality and is not subject to discovery or use in civil actions.

In Shelton v. Morehead Mem. Hosp., 318 N.C. 76, 347 S.E. 2d 824 (1986) information from original sources was not immune from discovery merely because it was presented during the medical review committee proceedings, and members of a medical review committee were not to be prevented from testifying regarding information learned from other than committee sources, even though that information might have been shared by the committee.

Section 90-21.22 permits the North Carolina Medical Board to enter into agreements with the North Carolina Medical Society and its local medical society components for the purpose of conducting peer review activities including investigation, review and evaluation of records, reports, complaints, litigation and other information about practices and practice patterns of physicians licensed by the Board, including programs for impaired physicians. The purpose of the programs shall be to identify, review, and evaluate the ability of physicians to function in their professional capacity and to provide programs for treatment and rehabilitation. Any confidential patient information and other nonpublic information is confidential and not discoverable in civil cases. Persons participating in good faith in the peer review programs shall not be required to disclose information in civil suits and peer review activities conducted in good faith are sanctioned by the State.

Section 90-21.22A protects medical review committees formed for the purpose of evaluating quality of, cost of, or necessity for health care services, including provider credentialing. Members of such committees who act without malice or fraud shall not be subject to liability for damages in civil actions because of acts, statements, or proceedings performed within the scope of the functions of the committee. The committee's proceedings, records and materials it produces, and materials it considers are confidential and not considered public records and shall not be discoverable in civil actions. No person in attendance at a committee meeting can be required to testify in civil actions as to evidence or matters produced or presented during the proceedings of the committee, or as to findings, recommendations, evaluations, opinions, or other actions of the committee or its members. Committee members may testify in civil actions, but cannot be asked about their testimony before the committee or any opinions formed as a result of committee hearings.

North Dakota

Section 23-34-03 of the North Dakota Century Code states that peer review records including data, information, reports, documents, findings, compilations and summaries, testimony, and any other records generated by, acquired by, or given to a peer review committee are privileged and not subject to subpoena or discovery or introduction into evidence in any civil or administrative action, except records gathered from an original source that is not a peer review committee, testimony from a person as to matters within that person's knowledge, provided the information was not obtained as a result of the person's participation in a professional peer review; or peer review records subpoenaed in an investigation conducted by an investigative panel of the board of medical examiners or subpoenaed in a disciplinary action before the board of medical examiners.

Section 23-01-15 established confidentiality for information, reports, and other data used in connection with a study conducted by or with the state department of health for the purpose of reducing morbidity or mortality. This information is inadmissible in a judicial or administrative proceeding. No research participant may disclose this confidential information, and no patient named in a report or a patient's relative may be interviewed without the prior consent of the attending physician and surgeon.

Ohio

Section 2305.25 of the Ohio Revised Code contains immunity protections for peer review or professional standards review committees of hospitals or state or local medical societies. Committee members, employees, and persons providing information to the committee are immune from lawsuits if their official actions are carried out without malice and in the reasonable belief that the action is warranted by the facts.

Under Section 2305.251, proceedings and records are not subject to discovery or use as evidence, and no person is permitted or will be required to testify about committee matters, including the findings, recommendations, or actions of the committee. These protections only extend to civil suits arising out of the matters which are at issue before the committee. Documents available from original sources are not immune from discovery simply because the committee saw them. Similarly, witnesses may testify about matters discussed before the committee if the witness had independent knowledge of those matters. This permission to testify does not extend to any opinion formed as a result of the committee meeting. Section 2305.24 extends similar confidentiality protections to hospital quality assurance and utilization review committees.

Oklahoma

Title 63, Section 1-1709, of the Oklahoma Statutes protects studies for the purpose of reducing morbidity or mortality conducted by the State Board of Health, the Oklahoma State Medical Association, or any committee or allied society thereof; the American Medical Association, or other national organization approved by the State Board of Health, or any committee or allied medical society thereof, or any in-hospital staff committee. Immunity extends to persons and organizations that provide information for such a study or publish the findings and conclusions. The findings may be released to advance medical research and medical education in the interest of reducing morbidity or mortality, and a summary of the studies may be released for general publication if the names of patients are not revealed.

Data, information, and reports furnished for the study, as well as the findings and conclusions, are privileged and may not be used or offered or received in evidence in legal proceedings, unless waived by the interested parties. Section 1-1709 also gives immunity to physicians and others serving on hospital utilization review committees for their decisions made in that capacity, provided they act in good faith.

Section 1-1709-1 has been amended and relates to peer review information which includes records, documents and information generated during the course of a peer review process, but does not include the medical records of a patient whose health care is being reviewed, incident reports and like documents regarding services being reviewed, regardless of their title or caption, the identity of persons who have personal knowledge regarding facts and circumstances surrounding the patient's care, factual statements regarding the patient's care from individuals who have personal knowledge of the facts and circumstances if the statements were generated outside the peer review process, the identity and copies of all documents and raw data created elsewhere and considered during the peer review process, whether available elsewhere or not,

and credentialing data regarding the health care professional who provided the health care services being reviewed or who is the subject of a credentialing process.

The peer review process means any process, program or proceeding, including a credentialing process utilized by a health care facility and, as amended, includes county medical societies that assess, review, study or evaluate credentials, competence, professional conduct or health care services of a health care professional.

Peer review information shall be privileged except that health care facilities or a county medical society are permitted to provide relevant peer review information to the agency or board which licensed the health care professional who provided the services being reviewed in the peer review process with notice to the health care professional. Immunity from discovery is not offered in certain circumstances in civil actions. No person involved in a peer review process may be permitted or required to testify regarding the process in any civil proceeding or disclose by written discovery requests any peer review information.

Title 76, Section 24 provides immunity to professional review bodies organized to maintain standards of conduct and competence for various professionals, including physicians. Professional review action means an action or recommendation taken or made by a professional review body which adversely affects a person's ability to perform a profession, but shall not include actions taken or recommendations made by private professional review bodies against a person who does not have a reasonable connection to the body's sponsoring organization which is defined as a professional association or institution through which persons practice a profession. Anyone supplying information in good faith to the professional review organization shall not be liable in any way. Protection does not extend to actions for violation of civil rights or antitrust.

Oregon

Section 41.675 of the Oregon Revised Statutes (1998) applies to committees of hospitals, health care facilities, and professional societies concerned with medical research, quality assurance, or the training, supervision, or discipline of physicians.

A person serving on a committee protected by the statute or providing information to the committee is immune from a lawsuit arising from any good faith action taken. Committee written reports, notes, and records are not admissible as evidence, except for those records dealing with the hospital care received by a litigant. The records are also admissible in lawsuits brought by physicians contesting a restriction or termination of staff privileges. Committee members and persons providing information to the committee may not be examined concerning the committee's proceedings or findings.

Pennsylvania

Title 63 of the Pennsylvania Statutes Sections 425.2 to 425.4 contains peer review provisions. The statute applies to a hospital committee or review organization established by a state or local professional society to evaluate and improve the quality of health care, reduce morbidity and

mortality, or promote cost containment. Section 425.3 grants immunity from lawsuits based on committee activities to committee members, employees, advisors and consultants, provided they acted without malice.

Under Section 425.4, review committee proceedings and records are not subject to discovery and use as evidence, and no person may testify about committee matters, including the findings of the committee. These protections only extend to civil suits arising out of matters at issue before the committee. Documents available from original sources are not immune from discovery simply because the committee saw them. Similarly, witnesses may testify about matters discussed before the committee if the witness had independent knowledge of those matters. This permission does not extend to any opinion formed as a result of the committee meeting.

Rhode Island

Sections 5-37.3-4 and 12-17-25 of the General Laws of Rhode Island provide immunity to peer review boards, their members and those furnishing information to the committee, provided they act without malice and in the reasonable belief that the action was warranted and within the scope of the board's functions.

The proceedings and records of peer review committees and boards are non-discoverable and inadmissible as evidence. Documents available from original sources are not immune from discovery simply because the committee saw them. Under Section 5-37.3-7, no person attending a committee meeting may testify about committee matters, including the findings of the committee. However, witnesses may testify about matters discussed before the committee if the witness had independent knowledge of those matters. This permission to testify does not extend to any opinion formed as a result of the committee meeting.

Exceptions to the provisions regarding privilege and witness testimony are allowed in lawsuits by the peer review board to restrict or revoke a physician's staff privileges, and for instances in which members of the peer review board are sued for actions taken by them. In such cases, any personally identifiable, confidential, health care information may not be disclosed without authorization. Furthermore, the imposition or notice of a restriction of privileges or licensure by a peer review board is discoverable.

South Carolina

Members of a duly appointed committee of a state or local professional society formed to maintain professional standards are immune from monetary liability under Section 40-71-10 of the South Carolina Code, if they act without malice and their actions are based on reasonable fact-finding. The section specifically includes morbidity and mortality committees appointed by the Department of Health and Environmental Control. The statute does not mention immunity for persons who provide information or otherwise cooperate with the committee.

Section 40-71-20 provides that all committee proceedings and data and information it acquires shall remain confidential unless a respondent being reviewed requests public disclosure. The

proceedings and documents are protected from discovery, subpoena, or use as evidence in civil actions, except upon appeal from the committee action. Documents otherwise discoverable do not become confidential simply because they were presented to the committee. Testimony about committee matters is not allowed except when the witness learned about such matters apart from the committee meeting. Committees appointed by the Department of Health and Environmental Control are permitted to issue reports containing only non-identifying data and information. Section 44-30-50 provides liability immunity to members of review panels, licensing boards, consultants, and persons providing information in good faith under the Health Care Professional Compliance Act. Section 44-30-60 provides that proceedings, records, and information are confidential except that the expert review panel may notify a person or entity charged with monitoring the requirements of the Act, and must notify the appropriate licensing board and Department of Health and Environmental Control of any noncompliance by a health care professional with the requirements of the expert review panel. The Department may take any action it deems necessary to protect the public health pursuant to the Act.

South Dakota

Section 36-4-25 of the South Dakota Codified Laws provides immunity for members of or consultants to a duly-appointed peer review committee comprised of physicians licensed to practice medicine or osteopathy, or to the medical staff or governing board of a licensed health care facility engaged in peer review activity. The immunity extends to any act of a member made without malice in the reasonable belief that it was warranted by the facts.

Section 36-4-26.1 protects all reports, records, statements, minutes, and any other data of the committee from discovery or admissibility at trial. No person will be required to testify about what transpired at a committee meeting. The discovery protections do not prevent a physician from obtaining information that formed the basis for a denial of staff privileges or employment. Further, the discovery protections do not apply to deny a person or their counsel access to materials in defense of an action against that person. Section 36-4-26.1 does not apply to observations made at the time of treatment by a health care professional present during the patient's treatment or to patient records prepared during the treatment and care rendered to a patient who is a party to an action or proceeding, the subject matter of which is the care and treatment of the patient. No member of any committee who has participated in peer review deliberations involving the subject matter of the action may testify as an expert witness for any party in an action for personal injury or wrongful death. Notwithstanding membership on a committee, a health care professional observing or participating in the patient's treatment and care may testify as a fact or expert witness concerning that treatment and care, but may not be required to testify to anything protected by 36-4-26.1.

Tennessee

Section 63-6-219 of the Tennessee Code Annotated protects a medical review committee or peer review committee of a state or local professional association or society, including impaired physician peer review committees, programs, malpractice support groups and their staff personnel, or a committee of any licensed health care institution, or its medical staff, or any

committee of a medical care foundation or HMO, PPO, individual practice association or similar entity, with the responsibility to evaluate and improve the quality of health care or to determine that health care services rendered were indicated, were performed in compliance with the applicable standard of care, that the cost of health care rendered was reasonable, and to evaluate or review the diagnosis or treatment or the performance of medical or hospital services. Immunity extends to committee members, staff members, consultants, and persons who provide information to the committee, provided they acted in good faith and without malice and on the basis of facts reasonably known or believed to exist. Immunity extends to entities, committees or individuals attempting to provide assistance directly related to and including alcohol or drug counseling and intervention through an impaired professional program to any licensee or applicant for license. Physicians' health programs and physicians' health peer review committees shall be immune from liability for providing intervention, referral, and other support services to minor children or spouse of physicians.

Information furnished to a protected committee is declared to be privileged. Committee records and proceedings, which are broadly defined, are confidential and not available through subpoena or discovery proceedings. Documents and records otherwise available from original sources remain available, however.

Texas

Under section 160.007 of the Texas Occupations Code , all proceedings and records of a medical peer review committee are confidential, and communications to such a committee are privileged. Unless disclosure is allowed or required by law, records, determinations, and communications of a medical peer review committee cannot be subpoenaed, and are non-discoverable and inadmissible. The statute provides an exception allowing records to be disclosed to another medical peer review committee, a government agency, the physician reviewed by the committee, or an accreditation body. Records may also be used in an anti-competitive action or civil rights proceeding, or an action arising from the committees proceedings in which the committee or a member of the committee is the defendant.

Under section 160.010, no cause of action accrues against members, agents, or employees of a medical peer review committee from any act, statement, determination, or recommendation made without malice in the course of peer review. Similar immunity extends to an individual who participates in medical peer review activity or furnishes information to a medical peer review committee.

Under Section 161.032 of the Texas Health and Safety Code, records and proceedings of a medical committee are confidential and not subject to subpoena or admissible at trial. Medical committees are defined in Section 161.031. This definition includes, among others, committees of a medical organization or hospital.

Utah

Section 58 13-4 of the Utah Code gives immunity to health care providers serving on committees of hospital or professional associations organized to evaluate and improve the quality of health care, or review professional and ethical standards. Immunity from liability is also granted to those providing information to such a committee. Immunity only applies to actions taken and information furnished in good faith without malice. Health care providers covered by this section are presumed to be acting in good faith and without malice absent clear and convincing evidence to the contrary.

Sections 26-25-1 through 26-25-4 authorize the Department of Human Services, medical societies, university medical centers, and professional associations to conduct studies for the purpose of reducing morbidity and mortality, or evaluating and improving hospital care. The statute gives immunity to persons who provide information for a study or who publish findings and conclusions. The information provided may only be used or published to advance medical research or reduce morbidity and mortality. Identification of the persons studied must be eliminated from any published versions of the findings. Information furnished for these studies and study findings and conclusions are privileged communications and not discoverable or admissible in legal proceedings.

Vermont

Sections 1441 to 1443, of Title 26 Vermont Statutes Annotated, protect peer review committees that are established by a hospital, HMO, state or local professional association, or other health care provider to evaluate and improve the quality of health care, to determine that health services rendered were professionally indicated, to ensure that health services are performed in compliance with the applicable standard of care, or that the cost of health care rendered was reasonable by health service providers. Committee members, employees, agents, consultants, and persons who assist the committee are immune from monetary liability for committee business if they act without malice and in the reasonable belief that the action is warranted. The proceedings, reports, and records of committees are not subject to discovery or use as evidence in any civil action arising out of the matters being reviewed by the committee. No person attending a committee meeting may testify about committee business or its findings, but may testify as to matters within their knowledge. Documents not generated by the committee that are available from the original sources and testimony based on independent knowledge are accessible even though such matters are considered by the committee. The proceedings, reports, records, supporting information and evidence of a peer review committee provided by the committee to a board may be used by the board for disciplinary purposes, but shall not be subject to public disclosure.

Virginia

Section 8.01-581.13 of the Virginia Code provides immunity from civil liability to actively practicing health professionals engaged in peer review, provided they act in good faith and without malicious intent. This review must be done as a member or agent of an entity

established by federal or state law, a hospital, or an association, society, or academy affiliated with one of a number of health professional associations or a governmental agency.
Section 8.01-581.16 extends similar immunity to hospital committees, boards, groups, commissions, and other entities established pursuant to federal or state law or JCAHO requirements, by public or private hospitals, or to committees acting with a governmental agency to review and evaluate the adequacy and quality of professional services. Committee members and consultants are immune from civil liability for any committee business not done in bad faith or with malicious intent.

Medical staff committee, utilization review committee, board, group, commission, other entity, and nonprofit entity providing a centralized credentialing service proceedings, minutes, records, and reports are partially exempt from discovery under Section 8.01-581.17, unless good cause arising from extraordinary circumstances justifies disclosure.

Privilege is not extended to hospital medical records kept in the ordinary course of business of operating a hospital or related to the hospitalization or treatment of any patient in the ordinary course of hospitalization. Accreditation and peer review records of the American College of Radiology and the Medical Society of Virginia are considered privileged communications.

Section 8.01-44.1 provides immunity from civil liability to members of committees, boards, groups, commissions, or other entities established pursuant to federal or state law or regulation which function to authorize, review, evaluate, or make recommendations on the nature, conduct, activities, or procedures involved in or related to programs or research protocols conducted under supervision of faculty or staff members of any hospital, college, or university, including experiments involving human subjects when committee business is conducted in good faith and without malicious intent, or if a committee member knows or should know that the program or protocol is in violation of Chapter 5.1 of Title 32.1. Immunity does not apply to those persons engaged in the actual conduct of the programs or protocols.

Washington

Sections 4.24.240 and 4.24.250 of the Revised Code of Washington provide immunity to health professionals, their employees, and health care entities and facilities for their peer review committee activities. The statute immunizes committee members, employees, investigators, and persons who supply information to the committee from liability for any good faith official action.

The proceedings, reports, and written records of such committees or of the protected individuals are not subject to subpoena or discovery except in cases arising out of a restriction or revocation of privileges.

West Virginia

Sections 30-1-16 and 30-3C-1 through 30-3C-3 of the West Virginia Code protect committees established by a state or local health professional society to reduce morbidity and mortality, to improve the quality of health care, to establish and enforce cost containment guidelines, or to

review qualifications and performance of health professionals. Immunity extends to the committee itself, and to persons who provide information to the committee, review organization members, and employees, providing they acted without malice and in a reasonable manner.

The proceedings and records of the review organization are protected from subpoena, discovery, and admissibility as evidence in any lawsuit arising out of the matters being reviewed by the organization. No person attending a meeting may testify about committee matters, although he or she may testify about matters otherwise within his or her knowledge. Information and documents available from original sources are not protected. An individual may execute a waiver authorizing release of contents of his or her file pertaining to his or her acts or omissions, and the waiver removes confidentiality and privilege. Upon further review by any other review organization, judicial review of any finding or determination of a review organization, or in a civil action filed by an individual whose activities have been reviewed, any testimony, documents, proceedings, records, and evidence adduced before the review organization are available to the further review organization, the court, and the individual whose activities have been reviewed. The court shall enter a protective order to provide for confidentiality of records provided to the court by the review organization and all papers and records relating to the proceedings before the reviewing court. In Young v. Saldanha, 189 W. Va. 330, 431 S.E. 2d 669 (1993), to effect a waiver of the privilege of confidentiality attendant to information and records which were the subject of health care peer review, an individual must formally indicate intent to waive the confidentiality provision by executing a valid waiver.

Wisconsin

Section 146.37 of the Wisconsin Statutes provides immunity to any program that reviews or evaluates health care services to improve the quality of health care, to avoid improper utilization of services of health care providers or facilities, or to determine the reasonable charges for such services, or who participates in obtaining health care information under chapter 153. Persons who participate in the review program are immune from civil damages for any official actions made in good faith.

Under Section 146.38, records of an organization's or individual's investigations, inquiries, proceedings, and conclusions may not be used in any civil action for personal injuries; however, information, documents, or records presented during peer review may not be construed as immune from discovery merely because they were so presented. A person who testifies during review or participates in review cannot testify in a lawsuit about any information obtained from the review process, but may testify as to matters within his or her knowledge. The statute specifies that the committee may release its findings if patient identification is withheld unless the patient grants permission to disclose identity in certain circumstances. The findings may also take the form of a statistical report.

Wyoming

Sections 35-17-101 through 106 of the Wyoming Statutes apply to professional standard review organizations, defined as medical organizations of a local, county, or state medical society

performing any review function, and to hospital medical staff quality assurance committees. Members of the organization, as well as the entity itself, are not liable for civil damages for official acts, except for intentional, malicious, or grossly negligent acts or omissions resulting in harm. Persons who provide information to a review organization are immune unless they know the information they provide is false or they provide information unrelated to the duties of the organization.

All reports, findings, proceedings, and data of the organization are confidential and privileged and exempt from discovery or introduction into evidence in any civil action. No person attending a meeting may testify about committee matters. However, information documents and records available from independent sources are not protected, and a committee member or witness may testify about matters otherwise within his or her knowledge, as long as he/she is not asked about his/her testimony before the committee or opinions formed as a result of the committee hearing.

List 1□
Statute Citations□

Alabama	Code of Ala. §§ 6-5-333, 22-21-8, 34-24-58
Alaska	Alaska Stat. §§ 18.23.010 to .070
Arizona	Ariz. Rev. Stat. Ann. §§ 36-2401 to -2404, 36-445 to -445.03
Arkansas	Ark. Stat. Ann. §§ 20-9-501 to -503, 16-46-105(a)
California	Cal. Civil Code §§ 43.7 to .8, 43.97; Cal. Evidence Code §§ 1156 to 7
Colorado	Colo. Rev. Stat. §§ 12-35.5-203, 12-36.5-101 to -105
Connecticut	Conn. Gen. Stat. §§ 19a-17b, 19a-25
Delaware	Del. Code Ann. tit. 24 §§ 1731A(h), 1768
District of Columbia.	DC Code Ann. §§ 32-501 to -505
Florida	Fla. Stat. §§ 766.101, 395.0193
Georgia	Ga. Code Ann. §§ 31-7-131 to -133, 31-7-140 to -143
Hawaii	Haw. Rev. Stat. §§ 663-1.7, 624-25.5, 671D-4 to 671D-11
Idaho	Idaho Code §§ 39-1392a to -1392f
Illinois	210 ILCS 85/10.2; 225 ILCS 60/5; 735 ILCS 5/8-2101
Indiana	Ind. Code Ann. §§ 34-30-15-1 to -21, 34-6-2-99
Iowa	Iowa Code §§ 135.40 to .42, 147.135
Kansas	Kan. Stat. Ann. 65-177 to -179, 65-4909, 65-4915, 65-442
Kentucky	Ky. Rev. Stat. Ann. § 311.377
Louisiana	La. Rev. Stat. Ann. § 13:3715.3
Maine	Me. Rev. Stat. tit. 32 §§ 2599, 3293, 3296; tit. 24 §§ 2502, 2510A, 2510-B, 2511

Maryland	Md. Health Occ. Code Ann.§§ 14-501 to -504, General Health Code Sections 13-1001 to -1007
Massachusetts	Mass. Ann. Laws ch. 111 §§ 1, 204; ch. 231 § 85N
Michigan	Mich. Complied Laws §§ 331.531 to .533, 333.21513, 333.21515
Minnesota	Minn. Stat. §§ 145.61 to .67
Mississippi	Miss. Code Ann. §§ 41-63-1 to -9, 41-63-23 to -29
Missouri	Rev. Stat. of Mo. § 537.035
Montana	Mont. Code Ann. §§ 37-2-201, 37-3-401 to -404, 50-16-102 , 50-16-201 to -205
Nebraska	Neb. Rev. Stat. §§ 25-12,121, 25-12,123, 71-147.01, 71-3401 to -3403, 71-7903
Nevada	Nev. Rev. Stat. §§ 49.265, 49.117 to .123
New Hampshire	N.H. Rev. Stat. Ann. §§ 151:13-a, 329:29, 507:8-C
New Jersey	N.J. Rev. Stat. §§ 2A:84A-22.8 to -22.10, 26:1A-37.2
New Mexico	N.M. Stat. Ann. §§ 41-9-2 to -6
New York	N.Y. Educ. Law § 6527, N.Y. Public Health Law §§ 206(1)j, 2805-j, 2805-m
North Carolina	N.C. Gen. Stat. §§ 131E-95, 90-21.22, 90-21.22A
North Dakota	N.D. Cent. Code §§ 23-01-15, 23-34-01 to 34-06
Ohio	Ohio Rev. Code Ann. §§ 2305.24 to .25, 2305.251
Oklahoma	Okla. Stat. tit. 63 § 1-1709, 1-1709-1, tit. 76 § 24
Oregon	Or. Rev. Stat. § 41.675
Pennsylvania	Tit. 63 Pa. Stat. §§ 425.2 to .4
Rhode Island	R.I. Gen. Laws §§ 5-37.3-4, 5-37.3-7, 12-17-25
South Carolina	S.C. Code Ann. §§ 40-71-10, 40-71-20, 44-30-50, 44-30-60

South Dakota ..... S.D. Codified Laws §§ 36-4-25, 36-4-26.1

Tennessee ..... Tenn. Code Ann. § 63-6-219, tit. 47 ch. 25

Texas..... Tex. Occ. Code 160.007, 160.010, Tex. Health & Saf. Code § ..... 161.031 to .032

Utah..... Utah Code Ann. §§ 26-25-1 to -4, 58-13-4, 158-13-5

Vermont..... Vt. Stat. Ann. tit. 26 §§ 1441 to 1443

Virginia..... Va. Code Ann. §§ 8.01-581.13, 8.01-581.16. to .17, 8.01-44.1, ... ch. 5.1, tit 32.1

Washington..... Wash. Rev. Code §§ 4.24.240, 4.24.250

West Virginia ..... W. Va. Code §§ 30-3C-1 to -3: 30-1-16

Wisconsin ..... Wis. Stat. §§ 146.37, 146.38

Wyoming ..... Wyo. Stat. §§ 35-17-101 to -106

Current as of January 2000 unless otherwise noted.

Appendix E

Examples of Data Abstraction Forms for Medical Records

Here are three examples of data abstraction forms.

The first is an example of a brief semi-structured medical record abstraction form.

The second is an abstraction form used by the New York State Department of Health, and the third is the form used by the Florida Department of Health.

Example 1

Example of semi-structured medical record abstraction form

CASE #

BACKGROUND:
Age, race/ethnicity, date of woman's birth, EDC, date of delivery or pregnancy termination, date of death, est gestational age.

LISTED CAUSE OF DEATH:
from death certificate

PAST MEDICAL HISTORY:

PRENATAL, LABOR & DELIVERY HISTORY:
Gravidity, parity

Admissions, symptoms, diagnoses, treatment, course of disease

POSTPARTUM HISTORY:
If applicable

FINDINGS:
E.g., autopsy or coroner's report
Reviewer's cause of death
Rationale for relation or lack of relation to pregnancy

CONCLUSION:
Pregnancy-related or not

Example 2

NEW YORK STATE DEPARTMENT OF HEALTH
CENTER FOR COMMUNITY HEALTH
DIVISION OF FAMILY HEALTH
BUREAU OF WOMEN'S HEALTH

NEW YORK STATE MATERNAL MORTALITY REVIEW

Case No.

Form MRAT

Medical Record #

Date of Death _____/_____/_____
month day year

Cause of Death
(as stated on death certificate)

Date of Birth≠ _____/_____ /_____
month day year

Age at death _____

Pregnancy Check Box Yes No No response

Gestation at time of delivery or death weeks days

Gravida ____ Parity ____ ____ ____ ____

Death before 24 wks gestation

Still pregnant	
Abortion/mole	
Ectopic gestation	

Death after 24 wks gestation

Antepartum	
Intrapartum	
Postpartum 0-7 days	
Postpartum 8 – 42 days	
Postpartum > 42 days	

Status of Infant(s)

	1	2
Live Birth		
Stillbirth*		
Neonatal death*		

*cause of death if known_____

Marital Status

Single	
Married	
Divorced/Separated	
Widowed	

Place of Birth _____ (on death certificate)

Racial/Ethnic group (Check all that apply)

White	
African-American	
Latina (Hispanic)	
Asian	
Native American	

Occupation _____

Did she work during pregnancy? Yes ☐ No ☐ Unknown ☐

Please comment on social and family circumstances
(e.g. living situation, language, access to care, substance abuse, domestic violence, unplanned or unintended pregnancy, etc.)

Pregnancy Risk Factors

a. Moderate Risk

[ ] Maternal age less than 17 or greater than 35
[ ] Race - non-white
[ ] Anemia - Hgb less than 11g
[ ] HIV positive
[ ] Smokes more than 1/2 pack per day
[ ] Substance abuse (including alcohol) -- low level
[ ] Prior cesarean section
[ ] Cardiac - Class I, II, or mitral valve prolapse
[ ] Epilepsy
[ ] Chronic medical condition
[ ] Sought prenatal care after 20 weeks

b. High Risk

[ ] Insulin Dependent Diabetes
[ ] Cardiac- Class III, IV, or arrhythmia
[ ] Rh Sensitization (Titer >1/8)
[ ] Uterine abnormality or incompetent cervix
[ ] Hypertension (>160/95) or requiring medication
[ ] Renal disease (chronic, serious)
[ ] more than 4 moderate risk factors

c. Very High Risk

[ ] Drug addiction/ alcoholism
[ ] AIDS
[ ] 2 or more high risk factors

What was the source of payment for perinatal care of the deceased

Medicaid/Medicare	
HMO	
Other insurance (specify_____)	
Self-pay	
Other	

MEDICAL HISTORY Antenatal

Was there any relevant past obstetric and medical history?
(e.g. chronic illnesses, previous pregnancy complications)

Contraceptive History

Relevant history of method(s) used in the year before index pregnancy. If hormonal contraception,
please give the name and duration of use

Name of Method	Duration

Previous Pregnancies (including abortions, ectopic pregnancies)

Year	Wks. Gestation	Method of Delivery	LB/SB/NND*****

*****LB= Live Birth SB= Stillbirth NND= Neonatal Death

Indicate source of prenatal information

[ ] full prenatal care record
[ ] prenatal care summary sheet
[ ] admission history
[ ] none

Was gestational age assessed before 20 weeks by ultrasound?

Yes ☐ No ☐ Unknown ☐

LMP ____/_____/_____

EDC ____/_____/_____

Were there any antenatal hospital admissions ?

Yes ☐ No ☐

if yes , please specify dates and reasons

MEDICAL HISTORY Intrapartum

Mode of delivery

Spontaneous	
Assisted vaginal	
Caesarean section	

If Caesarean section, please specify

Elective	
Planned Emergency*	
Unplanned Emergency**	
Peri/Post mortem***	

* Patient was in labor (or induction had failed) and was appropriately prepared for anaesthetic

** Desirable preparation was not possible

*** Terminally ill patient on cardio-respiratory support

Please specify any complications that occurred during the course of delivery.

Please give details of the events leading to this death

Was an autopsy performed? Yes ☐ No ☐ Unknown ☐

How would you classify this case?

____ pregnancy associated death

____ pregnancy related death

____ direct maternal death

____ indirect maternal death

OVERALL ASSESSMENT OF CARE

Were the care and services provided by the hospital and/or clinicians in accordance with professionally recognized standards?

Yes ☐ No ☐

Was there any failure in clinical management or occurrence of sub-standard care which caused or contributed to this death?

Yes ☐ No ☐

Occurrence of Sub-Standard Care

Antenatal Yes ☐ No ☐ Doubtful ☐

Contribution to Outcome Major ☐ Minor ☐ Irrelevant ☐

Intrapartum Yes ☐ No ☐ Doubtful ☐

Contribution to Outcome Major ☐ Minor ☐ Irrelevant ☐

Postpartum Yes ☐ No ☐ Doubtful ☐

Contribution to Outcome Major ☐ Minor ☐ Irrelevant ☐

In your opinion, was the mortality preventable?

Yes ☐ No ☐

Example 3

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FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

DATA SOURCES Attachment

(Check each record which was used for this abstraction)
(Also, please transfer to Abstracted Data Sheet)

- ❑ **Prenatal Record** (Specify below):
  - ❑ **Complete**
  - ❑ **Partial**
- ❑ **Labor and Delivery Record** (including Immediate Postpartum)
- ❑ **6 Week Postpartum Record**
- ❑ **Record of Terminal Event**
- ❑ **Medical Examiner's Report**
- ❑ **Autopsy Report**
- ❑ **Toxicology Report** (Specify Record in which it was located)
  _____
- ❑ **Pathology Report** (Specify Record in which it was located)
  _____
- ❑ **Healthy Start Care Coord. Record**
- ❑ **EMS Record**
- ❑ **Law Enforcement Record**
- ❑ **Home Care Record**
- ❑ **Other Hospital Records** (Not Related to Delivery or Terminal Event)
- ❑ **Social Service Record**
- ❑ **Other** (Specify)_____

PAMR Case #_____

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

OUTPATIENT VISIT Attachment

(Please fill out for each visit. Note reasons for any lapses in care.)

Date/Time:	
Place:	
Provider:	
Payer Source:	
Reason for Visit:	
Condition (Include vital signs, weight, etc.)	
Psychosocial Issues Identified:	
Education:	
Procedures/Labs:	
Family Planning: (type)	
Follow up:	

PAMR Case #_____

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

POSTPARTUM CARE Attachment

(Please fill out for each visit. Note reasons for any lapses in care.)

Date/Time:	
Place:	
Provider:	
Payer Source:	
Reason for Visit:	
Condition (Include vital signs, weight, etc.)	
Psychosocial Issues Identified:	
Education:	
Procedures/Labs:	
Family Planning: (type)	
Follow up:	

PAMR Case #_____

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

Check Source: Prenatal Record____ Healthy Start_____ Other(Specify)_____

DEMOGRAPHICS

(Not from Death Certificate)

1. PAMR CASE NUMBER

2. AGE AT LAST BIRTHDAY

4. MATERNAL PLACE OF BIRTH

- ❑ United States (50 states including DC)
- ❑ Puerto Rico
- ❑ Virgin Islands
- ❑ Guam
- ❑ Haiti
- ❑ Canada
- ❑ Cuba
- ❑ Mexico
- ❑ Remainder of the World (Specify) _____
- ❑ Unknown/Not Classifiable

5. OCCUPATION

- ❑ Unemployed
- ❑ Managerial & Professional
- ❑ Technical, Sales, Administrative Support
- ❑ Service Occupations
- ❑ Farming, Forestry, Fishing
- ❑ Student
- ❑ Housewife
- ❑ No Occupation or None
- ❑ Precision Production, Crafts & Repair, Operators, Fabricators, Laborers
- ❑ Other (Specify)_____
- ❑ Unknown

6. MARITAL STATUS

- ❑ Married
- ❑ Living as Married
- ❑ Never Married (Single)
- ❑ Divorced
- ❑ Separated
- ❑ Widowed
- ❑ Unknown/Not Classifiable

7a. RACE

- ❑ White
- ❑ Non-white

7b. ETHNICITY

- ❑ African - American
- ❑ Indian
- ❑ Chinese
- ❑ Japanese
- ❑ Hawaiian
- ❑ Other Entries
- ❑ Filipino
- ❑ Haitian
- ❑ Other Asian or Pacific Islander
- ❑ Unknown/Not Classifiable
- ❑ Hispanic (Specify by checking appropriate box below)
  - ❑ Mexican
  - ❑ Puerto Rican
  - ❑ Cuban
  - ❑ Central or South American
  - ❑ Other and Unknown Hispanic
  - ❑ Not Classifiable

8. EDUCATION

Elementary/Secondary

- ❑ 0
- ❑ 1
- ❑ 2
- ❑ 3
- ❑ 4
- ❑ 5
- ❑ 6
- ❑ 7
- ❑ 8
- ❑ 9
- ❑ 10
- ❑ 11
- ❑ 12

College

- ❑ 1 year
- ❑ 2 years
- ❑ 3 years
- ❑ 4 years
- ❑ ≥ 5 years
- ❑ Other

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

Check Source of Information: Prenatal record____ Healthy Start_____ Other(Specify)_____

MEDICAL HISTORY

Note: #'s 9 & 10 Omitted

11. GENERAL HISTORY

Problem	Patient Hx	Family Hx	Developed During Most Recent PG	Comments
a. Diabetes				
b. Hypertension				
c. Heart Disease				
d. Rheumatic Fever				
e. Mitral Valve Prolapse				
f. Kidney/UTI				
g. Gall Bladder/Liver				
h. Neuro/Mental/Emotional Health				
i. Epilepsy				
j. Hepatitis/Liver Disease				
k. Phlebitis/Varicosities				
l. STD/AIDS				
m. Thyroid Dysfunction				
n. Major Accidents				
o. History of Blood Transfusion				
p. Drug Allergies				
q. RH Sensitized				
r. Tuberculosis				
s. Asthma				
t. Gynecological Surgery				
u. Operations/Hospitalizations (Describe)				
v. Breast Disease/Mammography				
w. Anesthetic Complications				
x. History of Abnormal Pap				
y. Uterine Abnormality				
z. In Utero DES Exposure				
aa. Street Drugs				
bb. Cancer				
cc. Other Signs of Toxemia (Specify)				
dd. Evidence of Disability (Specify)				
ee. Other (Specify)				

12. IMMUNIZATION HISTORY			**(If not documented, check here____)**
a. Were childhood immunizations completed?	❑ Yes	❑ No	❑ Unknown
b. Were any immunizations received as an adult? (Specify which immunizations were received as an adult)	❑ Yes	❑ No	❑ Unknown
c. Were any immunizations received in the year prior to the woman's death? (Specify which immunizations were received as an adult)	❑ Yes	❑ No	❑ Unknown

13. SEXUAL HISTORY **(If not documented, check here____)**

a. Age (in years) at first intercourse: _____ years

b. Lifetime number of sexual partners: _____

	High	**Average**	**Low**
c. Risk of Hepatitis B?	❑ Blood Transfusion ❑ Multiple Sexual Partners ❑ IV Drug User ❑ Sex for Money	❑ > 1 Sexual Partner	❑ Monogamous ❑ No Risk Factors
d. Risk of HIV?	❑ Blood Transfusion ❑ Multiple Sexual Partners ❑ IV Drug User ❑ Sex for Money	❑ > 1 Sexual Partner	❑ Monogamous ❑ No Risk Factors

14. OBSTETRICAL HISTORY

a. Type of Contraception Most Recently Used **(If not documented, check here _____)**
(Specify date last used)_____

❑ None	❑ Diaphragm	❑ Female Sterilization
❑ Spermicides	❑ Condom	❑ Natural Family Planning
❑ Periodic Abstinence	❑ Pill (Specify type)_____	❑ Basal Body Temperature
❑ Withdrawal	❑ IUD	❑ Rhythm
❑ Cap	❑ Depo-Provera	❑ Combination (Specify) _____
❑ Sponge	❑ Norplant	❑ Other (Specify) _____

b. Was the patient breastfeeding in last 24 months?	**c. Did the patient have previous birth over 9 lbs.?**
❑ Yes	❑ Yes
❑ No	❑ No
❑ Unknown	❑ Unknown

d. Describe Menstrual Cycle. **(If not documented, check here _____)**

❑ Regular with No Spotting	❑ Other Irregularities (Specify) _____
❑ Regular with Spotting	❑ Unknown
❑ Skips Menses on a Regular Basis	Age started: _____years

e. Problems with previous pregnancies (Specify trimester)

Problem	Trimester			Comments
	First	Second	Third	
Bleeding				
Diabetes				
Hyperemesis				
Hypertension				
Low birth weight				
Toxemia				
Delivery (Specify)_____				
Other (Specify)_____				

f. Does the patient request contraception? ❑ Yes ❑ No

If yes, specify type (use list in question 14a) _____

15a. WEIGHT

a. Patient's last reported weight prior to the most recent pregnancy: _____ lbs.

b. Recent weight change other than pregnancy induced. ❑ Yes ❑ No

c. Describe the patient's weight. ❑ Obese (Preconceptual weight 20% or more above ideal for height) ❑ Underweight (10% or more under ideal weight for height) ❑ Within Normal Limits

15b. HEIGHT _____inches

16. REASON FOR INITIAL APPOINTMENT: (For example, is visit for prenatal, postpartum or for a health complaint? Include type and length of symptoms, treatment and follow up plans if noted.)

17. CURRENT MEDICATIONS

List all drugs documented as prescribed up to 3 months prior to the most recent pregnancy. Also include any medications if prescribed in the postpartum period. Include name of drug as written in record, dose, route, schedule for taking medication and date prescribed. (*e.g*. Penicillin 250 mg, PO, QID, date prescribed)

Drug	Date Prescribed	Reason
a.	____/____/____	
b.	____/____/____	
c.	____/____/____	
d.	____/____/____	
e.	____/____/____	

18. PRIOR HOSPITALIZATIONS

Date(s)	Length of Stay	Reason for Admission
_____/_____/_____ _____/_____/_____ _____/_____/_____		

19. SUBSTANCE USE

Does the medical history include assessment of maternal substance use, e.g. smoking, alcohol, or illicit drugs?

❑ Yes ❑ No ❑ Unknown

20. TOBACCO USE

❑ Yes ❑ No ❑ Unknown

If yes, then:

b. Type of tobacco (Cigarettes, Cigars, Oral) _____

c. Packs smoked per day _____

d. Number of years smoked _____

e. Age at which smoking began _____

21. ALCOHOL USE

❑ Yes ❑ No ❑ Unknown

If yes, then:

a. Type of alcohol (Beer, Liquor, Wine) _____

b. Drinks per week _____

c. Age at which drinking began _____

d. Addiction to alcohol?

❑ Yes ❑ No ❑ Unknown

22. OTHER SUBSTANCES USED (Check all substances used by this patient and indicate addiction problems in last 6 months)

Substance	How Ingested		When Used in Relation to PG	
❑ **Amphetamines** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Inhaled	❑ IV ❑ Unknown	❑ Before ❑ During	❑ After ❑ Unknown
❑ **Barbiturates** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Inhaled	❑ IV ❑ Unknown	❑ Before ❑ During	❑ After ❑ Unknown
❑ **Cocaine/Crack** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Inhaled	❑ IV ❑ Unknown	❑ Before ❑ During	❑ After ❑ Unknown
❑ **Hallucinogens** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Inhaled	❑ IV ❑ Unknown	❑ Before ❑ During	❑ After ❑ Unknown
❑ **Heroin** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Inhaled	❑ IV ❑ Unknown	❑ Before ❑ During	❑ After ❑ Unknown
❑ **Marijuana/Cannabis** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Inhaled	❑ IV ❑ Unknown	❑ Before ❑ During	❑ After ❑ Unknown

22. OTHER SUBSTANCES USED (Cont.)(Check all substances used by this patient and indicate addiction problems in last 6 months)

Substance	How Ingested	When Used in Relation to PG
❑ **Methadone** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ IV ❑ Inhaled ❑ Unknown	❑ Before ❑ After ❑ During ❑ Unknown
❑ **Methamphetamine** or **Crystal** ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ IV ❑ Inhaled ❑ Unknown	❑ Before ❑ After ❑ During ❑ Unknown
❑ **Herbs** (Specify)_____ _____ ❑ **Other** (Specify)_____ ❑ Known addiction in the 6 months prior to the most recent pregnancy	❑ PO ❑ Other____ ❑ Unknown ❑ PO ❑ IV ❑ Inhaled ❑ Unknown	❑ Before ❑ After ❑ During ❑ Unknown ❑ Before ❑ After ❑ During ❑ Unknown

23. HIV

a. Was there documentation that the patient was offered an HIV test?	**b. Patient's response to the offer of HIV testing:**
❑ Yes ❑ No	❑ Accepted (Complete c,d,e) ❑ Refused
c. Was there documentation that the patient was offered pre-test counseling?	**d. Was there documentation that the patient was offered post-test counseling?**
❑ Yes ❑ No	❑ Yes ❑ No
e. Results of HIV testing: ❑ Positive ❑ Negative	

24. PSYCHOSOCIAL ASSESSMENT

a. Was a Psychosocial Assessment made on this patient?	**b. Was a caseworker available to this program/facility for assessment/follow-up?**
❑ Yes ❑ No ❑ Unknown	❑ Yes ❑ No ❑ Unknown
c. Did a caseworker see this patient?	**d. Did a caseworker develop a case management plan for problems noted below?**
❑ Yes ❑ No ❑ Unknown	❑ Yes ❑ No ❑ Unknown

e. Problems identified by medical, nursing or social work personnel.

(If not documented, check here_____)

Problem Identified	Care Plan	Referral	Services Received
❑ Family Violence	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Chronic illness (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Communication barriers	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Crime/legal problems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Depression	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Disability (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Disturbed relationship with a child	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Substance use (Tobacco, Drugs, or Etoh)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Employment/educational needs	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Housing inadequate/homeless	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Frequent moves (>3 times in last 2 months)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Inadequate support systems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Late life pregnancy (Age >39 years)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Mother abused as a child	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Need for financial support	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Poor nutrition/hunger	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Single mother	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Suicidal ideation	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Teen mother (Age < 18 years)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Transportation problems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Stress	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Difficulty keeping appointments	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Unsafe neighborhood	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Hazardous work exposure	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Other (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ None			

f. Comments on Medical History:

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

PRENATAL CARE

❑ **Complete** ❑ **Partial**

25. ***TYPE of PRIMARY PRENATAL PROVIDER*** (Check one only)	**26.** ***PAYER SOURCE*** (Check one only)
❑ Family Physician ❑ Obstetrician ❑ Certified Nurse Midwife ❑ Licensed Midwife ❑ Alternative Provider (Specify)_____ ❑ Physician Assistant ❑ Nurse Practitioner (ARNP) ❑ Other (Specify)_____ ❑ None ❑ No Source Data	❑ Medicaid HMO ❑ Medipass ❑ Private Insurance ❑ Managed Care Organization **(HMO, PPO, IPA, etc.)** ❑ Self pay ❑ Other (Specify)_____ ❑ No Source Data

27. PRENATAL CARE RECEIVED BY MOTHER

❑ Yes ❑ No ❑ No Source Data

28. ***DATE PRENATAL CARE BEGAN*** _____/_____/_____ ***# gestational weeks =*** _____

29. ***LAST DATE OF PRENATAL CARE*** _____/_____/_____ ***# gestational weeks =*** _____

30a. ***PRIMARY LOCATION OF PRENATAL CARE*** (Check one only)

❑ Private Office	❑ Health Department	❑ Neighborhood Clinic
❑ Hospital Clinic	❑ Family Planning Center	❑ Other (Specify)_____
❑ Birthing Center	❑ HMO Clinic	❑ No Source Data

30b. ***REFERRED FOR SPECIALIST CARE*** ❑ Yes ❑ No

If yes, ***Type of Specialist***_____Reason_____Date_____

31a. ***NUMBER OF PRENATAL VISITS*** (Enter exact number)

Documented # of Prenatal Visits_____ ❑ No Source Data

31b. ***PREGNANCY PLANNED?:*** (Mark one)

❑ Intended ❑ Unintended ❑ No Source Data

32. DATE OF LAST MENSTRUAL PERIOD	**33. EDD DATE**	**34. Sonogram EDD DATE**
____/_____/____	____/____/____	___/____/___ **Date Sonogram Done** ____/____/____ **Gestational weeks**_____

35. ***GRAVIDA*** _____ **(Give figures during the last pregnancy.)**	**36.** ***PARA*** **(Give figures during the last pregnancy.)** _____/_____/_____/_____ **Full Term Preterm Abortions Living Children**

37. MATERNAL GENETIC PROBLEMS
(Describe)

38. INFANT GENETIC PROBLEMS
(Describe)

39. PREVIOUS PREGNANCIES (Do **NOT** include pregnancy most proximal to the mother's death)

a. Date _____/_____/_____

b. Pregnancy Outcome

- ❑ Spontaneous Abortion
- ❑ Still Birth
- ❑ Therapeutic Abortion
- ❑ Live Birth
- ❑ Ectopic

c. If live birth, please specify birthweight.
_____lbs.

d. Current Status of Infant.

- ❑ Living
- ❑ Deceased
- ❑ Unknown

e. Maternal Complications

- ❑ Yes
- ❑ No

f. If yes to complications, please specify below.

40. PREVIOUS PREGNANCIES

a. Date _____/_____/_____

b. Pregnancy Outcome

- ❑ Spontaneous Abortion
- ❑ Still Birth
- ❑ Therapeutic Abortion
- ❑ Live Birth
- ❑ Ectopic

c. If live birth, please specify birthweight.
_____lbs.

d. Current Status of Infant.

- ❑ Living
- ❑ Deceased
- ❑ Unknown

e. Maternal Complications

- ❑ Yes
- ❑ No

f. If yes to complications, please specify below.

41. PREVIOUS PREGNANCIES

a. Date _____/_____/_____

b. Pregnancy Outcome

- ❑ Spontaneous Abortion
- ❑ Still Birth
- ❑ Therapeutic Abortion
- ❑ Live Birth
- ❑ Ectopic

c. If live birth, please specify birthweight.
_____lbs.

d. Current Status of Infant.

- ❑ Living
- ❑ Deceased
- ❑ Unknown

e. Maternal Complications

- ❑ Yes
- ❑ No

f. If yes to complications, please specify below.

42. PREVIOUS PREGNANCIES

a. Date _____/_____/_____

b. Pregnancy Outcome

- ❑ Spontaneous Abortion
- ❑ Still Birth
- ❑ Therapeutic Abortion
- ❑ Live Birth
- ❑ Ectopic

c. If live birth, please specify birthweight.
_____lbs.

d. Current Status of Infant.

- ❑ Living
- ❑ Deceased
- ❑ Unknown

e. Maternal Complications

- ❑ Yes
- ❑ No

f. If yes to complications, please specify below.

43. HIV

a. Was there documentation that the patient was offered an HIV test?	**b. Patient's response to the offer of HIV testing:**
❑ Yes ❑ No	❑ Accepted (Complete c,d,e) ❑ Refused
c. Was there documentation that the patient was offered pre-test counseling?	**d. Was there documentation that the patient was offered post-test counseling?**
❑ Yes ❑ No	❑ Yes ❑ No
e. Results of HIV testing: ❑ Positive ❑ Negative	

44. LABORATORY SCREENING TEST

INITIAL LABS (WHEN INDICATED)	**DATE/ WKS**	**(WERE RESULTS NORMAL?)**		**Results**	**If Abnormal,**	
					Specify Actions	**Repeat Results**
a. HCT/HGB (Specify)		❑ Yes	❑ No			
b. HbsAG		❑ Yes	❑ No			
c. Syphilis		❑ Yes	❑ No			
d. Rh Antibody Screen		❑ Yes	❑ No			
e. Blood type		❑ Yes	❑ No			
f. Rubella		❑ Yes	❑ No			
g. Gonorrhea		❑ Yes	❑ No			
h. PAP smear		❑ Yes	❑ No			
OTHER LABS	**DATE/ WKS**	**(WERE RESULTS NORMAL?)**		**Results**	**If Abnormal,**	
					Specify Actions	**Repeat Results**
i. HCT/HGB (Specify)						
j. Group B Strep		❑ Yes	❑ No			
k. GTT (If abnormal screen)		❑ Yes	❑ No			
l. TB test		❑ Yes	❑ No			
m. Urinalysis		❑ Yes	❑ No			
n. Chlamydia		❑ Yes	❑ No			
o. MSAFP		❑ Yes	❑ No			
p. Other (Specify) _____		❑ Yes	❑ No			
q. Other (Specify) _____		❑ Yes	❑ No			
OPTIONAL LABS	**DATE/ WKS**	**(WERE RESULTS NORMAL?)**		**Results**	**If Abnormal,**	
					Specify Actions	**Repeat Results**
r. Wet Mount & KOH		❑ Yes	❑ No			
s. Herpes Culture		❑ Yes	❑ No			
t. Drug Screen		❑ Yes	❑ No			
u. HGB Electrophoresis		❑ Yes	❑ No			
v. Platelets		❑ Yes	❑ No			
w. FTA-ABS if		❑ Yes	❑ No			
x. Syphilis Screen		❑ Yes	❑ No			
y. Urine C & S		❑ Yes	❑ No			
z. Other (Specify) _____		❑ Yes	❑ No			

aa. Other (Specify) _____		❑ Yes	❑ No			
bb. Other (Specify) _____		❑ Yes	❑ No			
cc. Other (Specify) _____		❑ Yes	❑ No			

45. COMMENTS

46. PROCEDURES

PROCEDURES (Include date/weeks/any other info.)	**RESULTS**
❑ Ultrasounds:	
1……..	……
2……..	……
3……..	……
4……..	……
❑ Non Stress Test	
……	……
……	……
❑ Oxytocin Trial (CST)	
……	……
……	……
❑ Amniocentesis	
……	……
……	……
❑ Amnioinfusion	
……	……
……	……
❑ Colposcopy……	……
❑ Alternative Therapies (Specify)	
……	……
……	……
……	……

47. PSYCHOSOCIAL ASSESSMENT

a. Was a Prenatal Psychosocial Assessment performed?	**b. Was a caseworker available to this program/facility for assessment/follow-up?**
❑ Yes	❑ Yes
❑ No	❑ No
❑ Unknown	❑ Unknown

c. Problems identified by medical, nursing or social work personnel during prenatal care
(If same as in Medical History, check here _____ and go to Part d.)

Problem Identified	**Care Plan**	**Referral**	**Services Received**
❑ Battered during pregnancy	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Chronic illness (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Communication barriers	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Crime/legal problems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

c. Problems identified by medical, nursing or social work personnel during prenatal care (cont.)

Problem Identified	Care Plan	Referral	Services Received
❑ Depression	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Disability (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Disturbed relationship with a child	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Substance use (Tobacco, Drugs, Etoh)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Employment/educational needs	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Housing inadequate/homeless	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Frequent moves (>3 moves/last 2 months)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Inadequate support system	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Late life pregnancy (Age > 39 years)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Mother abused as a child	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Need for financial support	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Poor nutrition	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Single mother	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Suicidal ideation (Age < 18 years)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Teen mother	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Transportation problems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Hazardous exposures at work	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Other (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Other (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Other (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

d. Did a caseworker see the mother?	**e. Did a caseworker develop a case management plan for problems noted above?**
❑ Yes	❑ Yes
❑ No	❑ No
❑ Unknown	❑ Unknown

f. COMMENTS

48. MEDICATIONS PRESCRIBED DURING PREGNANCY

List all drugs documented as prescribed. Include name of drug as written in record, dose, route, schedule for taking medication and date prescribed. (*e.g.* Penicillin 250 mg, PO, QID, date prescribed)

Drug	Date Prescribed	Comments
a.	____/____/____	
b.	____/____/____	
c.	____/____/____	
d.	____/____/____	

48. MEDICATIONS PRESCRIBED DURING PREGNANCY (Cont.)		
e.	____/____/____	
f.	____/____/____	
g.	____/____/____	

49. *PRE-PREG WEIGHT/HEIGHT*	**50. PREGNANCY OBSERVED WEIGHT GAIN**
a. *Weight*_____lbs. ❑ Unknown **b. *Height*_____**in. ❑ Unknown	_____lbs. during _____weeks

51. NUTRITIONAL FACTORS PRESENT DURING PREGNANCY

Deviation in weight	Care Plan	Referral	Services Required
❑ Obesity (preconceptual weight 20% or more above ideal weight for height)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Excessive weight gain (> 8 lbs./month)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Low pre-pregnancy weight (10% or more under ideal weight for height)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Inadequate weight gain during pregnancy (less than 2 lbs./month after first trimester	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

52. REFERRALS to health or human services programs during pregnancy (Please check all that apply)

❑ Healthy Start Services	❑ Genetic Evaluation	❑ Employment Office	❑ Other Drug Treatment Programs
❑ Nurse Home Assessment/Follow-up	❑ Family Planning	❑ Homemaker or Home Health Aids	❑ Child Protective Services
❑ Other Case Management	❑ Transportation	❑ Smoking Cessation Program	❑ Other (Specify) _____
❑ WIC	❑ Housing Authority	❑ Mental Health Services	❑ Other (Specify) _____
❑ Dietitian or Nutritional Counseling	❑ Group Shelters: Homeless or Battered (Circle One)	❑ Methadone Maintenance Program	❑ None

53. REFERRALS to community based organizations during pregnancy (Please check all that apply)

❑ Childbirth Education	❑ Community Health Worker	❑ Narcotics Anonymous	❑ Other (Specify) _____
❑ Breastfeeding Support Group	❑ Local Church Organization	❑ Alcoholics Anonymous	❑ Other (Specify) _____
❑ Peer Group Support	❑ United Way	❑ None	❑ Other (Specify) _____
❑ Parenting Hotline/Support Groups	❑ Food Bank		

54. *PRENATAL RISK ASSESSMENT*

a. ***Was prenatal risk assessed?***	❑ Yes	❑ No	❑ Refused Screen	❑ Unknown
b. ***What system was used to assess risk?***	❑ Creasy ❑ Healthy Start	❑ Hollister ❑ Propras	❑ Other ❑ None	_____
c. Specify level of risk based on system used to assess risk.	❑ Low	❑ Moderate	❑ High	❑ Very High

55. HEALTHY START

a. What was the patient's Healthy Start Score?_____

b. Was the patient at risk, but not referred?	❑ N/A	❑ Yes	❑ No	❑ Unknown

c. What factors determined the referral status of this patient?

❑ Score >4 ❑ Other Factors ❑ Self Referred

d. Did the patient refuse the program?	❑ N/A	❑ Yes	❑ No	❑ Unknown
e. Was care coordination indicated?	❑ N/A	❑ Yes	❑ No	❑ Unknown
f. Was care coordination received?	❑ N/A	❑ Yes	❑ No	❑ Unknown

56. HEALTHY START RISK FACTORS (from Prenatal Screen)

❑ Age Less than 18	❑ Feel Unsafe
❑ Age More than 39	❑ Hungry
❑ Race = Black	❑ Tobacco
❑ Unmarried	❑ Drug or Alcohol Use
❑ Less than High School Education	❑ Timing of Pregnancy ____Earlier ____Later ____Not at All
❑ Prepregnancy Weight Less than 110 lbs.	❑ Previous Poor Outcome
❑ Problems Keeping Appointments	❑ Illness Requiring Ongoing Care
❑ Moved More than 3 Times in One Year	❑ Trimester of Entry to Care = 2nd

61. PRENATAL EDUCATION **(Note: #'s 57-60 Omitted)**

At any time during the prenatal period, were any of the following topics documented in writing as having been discussed? (Check all that apply) **(If not documented, check here____)**

❑ Avoidance of alcohol, drugs, tobacco, and over-the-counter medications	❑ Sexuality during pregnancy
❑ Harmful environmental exposures	❑ Signs of labor
❑ Healthy Start	❑ Signs of preterm labor
❑ Labor and delivery process	❑ Stress
❑ Obstetrical anesthesia and analgesia	❑ Signs of complications of pregnancy
❑ Physical activity and exercise during pregnancy	❑ Relaxation techniques during pregnancy
❑ Physical and emotional changes during pregnancy	❑ Rights and responsibilities of the pregnant woman
❑ Nutrition education including appropriate dietary intake, RDA during normal pregnancy, and appropriate weight gain	❑ Risk of HIV infection and risk reduction behaviors
	❑ Infant sleep position and bedding
	❑ Fetal movement
	❑ Other (Specify) _____

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

Prenatal Care Visits Attachment

Date	Weeks	Fundal Ht.	Weight	BP	FHT	Procedures	Comments

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

HOSPITALIZATION #___

Note: Complete for each hospitalization, add number above, and insert into chronological order.

62. LEVEL OF HOSPITAL

❑ Level 1 ❑ Level 2 ❑ Level 3

63. DATE OF ADMISSION
_____/_____/_____

64. TIME OF ADMISSION
_____ **AM** or **PM**
(Circle one)

65. ADMITTING DIAGNOSIS/CONDITION: Include vital signs/BP and admission history.

If during postpartum period, include weeks/days post delivery _____

66. If patient was admitted as a TRAUMA patient, then state the cause of the trauma and the location where the injury occurred. If automobile trauma, include info. on use of seat belts.

67. TRANSPORTATION TO HOSPITAL (Check one only)

- ❑ EMS Team/Ambulance (If checked, fill out transport abstraction tool)
- ❑ Family's or Friend's Auto
- ❑ Drove Self
- ❑ Walked
- ❑ Bus or Cab
- ❑ EMS Helicopter (If checked, fill out transport abstraction tool)
- ❑ Other (Specify) _____
- ❑ Unknown

68. FINAL DISPOSITION OF PATIENT

- ❑ Deceased on Arrival
- ❑ Deceased before Discharge
- ❑ Home
- ❑ Skilled Nursing Facility
- ❑ Transferred to Another Hospital
- ❑ Other (Specify) _____
- ❑ Unknown

69. PAYER SOURCE FOR HOSPITALIZATION

- ❑ Medicaid HMO
- ❑ Medipass
- ❑ Private Insurance
- ❑ Managed Care Organization **(HMO, PPO, IPA, etc.)**
- ❑ Self pay
- ❑ Other (Specify) _____
- ❑ No Source Data

70. PHYSICAL EXAM ON ADMISSION (If abnormal, describe)

	Normal	Abnormal	No Source Data	Comments
a. Head	❑	❑	❑	
b. Eyes	❑	❑	❑	
c. Ears	❑	❑	❑	
d. Nose	❑	❑	❑	
e. Throat/Palate/Mouth	❑	❑	❑	
f. Lungs	❑	❑	❑	
g. Heart	❑	❑	❑	
h. Abdomen	❑	❑	❑	
i. Stomach	❑	❑	❑	
j. Liver	❑	❑	❑	
k. Spleen	❑	❑	❑	
l. Umbilical	❑	❑	❑	
m. Kidneys	❑	❑	❑	
n. Bladder	❑	❑	❑	
o. Genitalia	❑	❑	❑	
p. Neurologic	❑	❑	❑	
q. Skeletal	❑	❑	❑	
r. Extremities	❑	❑	❑	
s. Spine	❑	❑	❑	
t. Trunk	❑	❑	❑	
u. Skin	❑	❑	❑	
v. Color/Appearance	❑	❑	❑	
w. Other (Specify)_____	❑	❑	❑	

71. Was the patient pregnant on admission?	**72. Did the patient deliver up to 1 hour prior to admission or was there a precipitous delivery?**	**73. Was a pregnancy test performed on admission?**
❑ Yes # weeks_____ ❑ No ❑ Unknown	❑ Yes ❑ No ❑ Unknown	❑ Yes ❑N/A ❑ No ❑ Unknown

74. If pregnant, describe status and outcome.

❑ In Labor	❑ Cervical Dilation	❑ WNL for Stage of Pregnancy
❑ Ruptured Membranes	❑ Cervical Effacement	❑ Outcome _____

75. If pregnant, which methods were used to evaluate labor/delivery status?

❑ OB on call	❑ ER physician	❑ Ultrasound at_____
❑ L & D personnel	❑ FHT by _____	❑ Other_____

Comments:

76. TESTS DONE DURING THIS HOSPITALIZATION (If abnormal, please comment)		
a. Urine Tests	**Date**	**Results**
❑ Guaiac		
❑ Urinalysis		
❑ Urine Microscopic		
❑ Urine Culture		
❑ Drug screen		
❑ Other_____		
b. Stool Specimens	**Date**	**Results**
❑ Blood Present		
❑ Culture		
c. X-rays	**Date**	**Results**
❑ Skull		
❑ Chest		
❑ Abdomen		
❑ CAT Scan (Give type)		
❑ MRI		
❑ Other _____		
d. Other Tests	**Date**	**Results**
❑ EKG		
❑ EEG		
❑ Ultrasound		
❑ Other _____		
e. Cultures	**Date**	**Results**
❑ Blood (Aerobic/ Anaerobic)		
❑ Throat		
❑ Mycobacterium		
❑ Wound		
❑ Uterine		
❑ Cervical for Gonorrhea		
❑ Cervical for Chlamydia		
❑ Group B Strep		
❑ Other _____		
f. Blood Tests	**Date**	**Results**
❑ Hep B Surface Antigen		
❑ HIV		
❑ GTT		
❑ ANA Titer		
❑ CD4 Level		
❑ CBC		

Blood Tests (cont.)	Date	Results
❑ T3/T4/TSH		
❑ Clotting Factors		
❑ Platelets		
❑ Electrolytes		
❑ Liver Enzymes		
❑ BUN		
❑ Other _____		

77. MEDICATIONS DURING HOSPITALIZATION
Please indicate all types of medication given during hospitalization.

❑ Antimetic/antinausea	❑ Aspirin substitute	❑ Oral contraceptives
❑ Antacids	❑ Combinations	❑ Sedatives/tranquilizers
❑ Anti-cancer medication	❑ Diuretic	❑ Steroids/hormones
❑ Anti-convulsant	❑ Hypnotic	❑ Vaginal medication
❑ Anti-histamine	❑ Hypothyroid medication	❑ Vitamins
❑ Anti-hypertensive	❑ Insulin	❑ Anti-HIV
❑ Anti-inflammatory	❑ Iron	❑ Blood product
❑ Antibiotic	❑ Laxative/suppositories	❑Magnesium Sulfate: Time started and amount:_____
		❑Other (Specify)_____
❑ Aspirin	❑ Narcotics	❑ Unknown

78. ATTENDING PHYSICIAN/CLINICIAN DURING HOSPITALIZATION

❑ Internist	❑ ARNP
❑ Family Physician	❑ Physician Assistant
❑ Obstetrician	❑ Student
❑ CNM	❑ Other (Specify)_____

79. CONSULTING PROVIDERS DURING HOSPITALIZATION

❑ Internist	❑ Specialist (Specify)_____
❑ Psychiatrist	❑ Other (Specify)_____
❑ Special Nursing Case Management	❑ None
❑ Social Worker	

80. PSYCHOSOCIAL ASSESSMENT

a. Was a caseworker available on the unit for psychosocial assessment during hospitalization?

❑ Yes
❑ No ❑ Unknown

b. Did a caseworker contact the mother during hospitalization?

❑ Yes
❑ No ❑ Unknown

c. Problems identified by medical, nursing or social work personnel during hospitalization:
(If not documented, check here_____)

Problems Identified	Care Plan	Referral	Services Received
❑ Battered during pregnancy	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Bereavement support family	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Chronic illness (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Communication barriers	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Crime/legal problems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Depression	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Disability (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Disturbed relationship with a child	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

c. Problems identified by medical, nursing or social work personnel during hospitalization (Cont.)

Problem Identified	Care Plan	Referral	Services Received
❑ Drug or alcohol abuse	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Employment/educational needs	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Housing inadequate/homeless	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Inadequate support systems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Late life pregnancy (Age >39 years)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Mother abused as a child	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Need for financial support	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Poor nutrition	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Single mother	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Suicidal ideation	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Surviving children	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Teen mother (Age <18 years)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Transportation problems	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Other (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Other (Specify)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ None			

81. WEIGHT RECORDED ON ADMISSION

❑ Yes If yes, state weight in pounds_____

❑ No If no, estimate weight in pounds_____

❑ Unknown

82. HEIGHT RECORDED ON ADMISSION

❑ Yes If yes, state height in inches_____

❑ No If no, estimate height in inches_____

❑ Unknown

Comments:

83. NUTRITIONAL FACTORS PRESENT DURING ADMISSION

Deviation in weight	Care Plan	Referral	Services Received
❑ Obesity (preconceptual weight 20% or more above ideal weight for height)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Underweight (10% or more under ideal weight for height)	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Weight loss during hospitalization	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Difficulty eating or swallowing	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
❑ Need for a special diet. (Specify type of diet)_____	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

84. Was a nutritional assessment documented in the chart?	**85. Was a referral to a registered dietitian ordered?**	**86. Did the dietitian see the mother?**
❑ Yes ❑ No ❑ Unknown	❑ Yes ❑ No ❑ Unknown	❑ Yes ❑ No ❑ Unknown

87. DISCHARGE PLANNING

a. Hospitalization Outcome	❑ The patient expired. Date_____ Time_____	❑ The patient was discharged home. Date_____ Time_____	❑ The patient was discharged elsewhere. Date_____ Time_____	❑ Unknown

b. If patient expired, summarize the events leading her death.

c. Is there documentation of follow-up /evaluation for children whose mother died during hospitalization? If yes, describe.	❑ Yes	❑ No	❑ Unknown
d. Is there documentation of social services for family of deceased mother? If yes, describe (i.e. assistance with funeral arrangements, referrals to community, etc.)	❑ Yes	❑ No	❑ Unknown
e. Was a discharge plan documented in the records?	❑ Yes	❑ No	❑ Unknown
f. Was a follow-up medical visit scheduled?	❑ Yes	❑ No	❑ Unknown

g. With whom was the follow-up visit scheduled?

❑ Private Physician	❑ Outpatient Clinic	❑ Transferred to Another Hospital	❑ Other (Specify)_____

88. REFERRALS: To outpatient follow-up care with health or human services programs before discharge. (Check all that apply)

❑ Healthy Start Services	❑ Genetic Evaluation	❑ Employment Office	❑ Other Drug Treatment Programs
❑ Nurse Home Assessment/Follow-up	❑ Family Planning	❑ Homemaker or Home Health Aids	❑ Child Protective Services
❑ Other Case Management	❑ Transportation	❑ Smoking Cessation Program	❑ Other (Specify)_____
❑ WIC	❑ Housing Authority	❑ Mental Health Services	❑ Other (Specify)_____
❑ Dietitian or Nutritional Counseling	❑ Group Shelters: Homeless or Battered (Circle one)	❑ Methadone Maintenance Program	❑ None

Comments:

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

TRANSPORT

89. REASON FOR TRANSFER
Date/time:

90. MATERNAL CONDITIONS

OBSTETRIC CONDITION	MEDICAL COMPLICATIONS	SURGICAL COMPLICATIONS
❑ Premature rupture of membranes	❑ Serious infection	❑ Trauma requiring ICU or surgical correction
❑ Premature labor	❑ Severe heart disease	❑ Procedure that may induce labor
❑ Severe pre-eclampsia	❑ Poorly controlled diabetes	❑ Acute abdominal emergency
❑ Hypertensive disorder	❑ Thyrotoxicosis	❑ Other (Specify)_____
❑ Third trimester bleeding	❑ Renal disease with deteriorating function or increased hypertension	
❑ Other (Specify)_____	❑ Drug overdose	
	❑ Other (Specify)_____	

91. FETAL CONDITIONS (Describe)	**92. NEONATAL CONDITIONS** (Describe)

93. WHO MANAGED THE TRANSPORT?	**94. TRANSPORT VEHICLE**
❑ Attending Physician	❑ Ground Ambulance
❑ Another Clinician	❑ Fixed-wing Aircraft
❑ Other (Specify)_____	❑ Helicopter
	❑ Other (Specify)_____

95. TIMING OF EMS (Circle AM or PM)	**96. LEVEL OF HOSPITAL**
a. _____**AM/PM** Call Received	Referring Facility
b. _____**AM/PM** Depart for Referring Facility	❑ Level 1 ❑ Level 2 ❑ Level 3
c. _____**AM/PM** Arrive at Referring Facility	
d. _____**AM/PM** Depart for Receiving Facility	Receiving Facility
e. _____**AM/PM** Arrive at Receiving Facility	❑ Level 1 ❑ Level 2 ❑ Level 3

97. PROCEDURES BEFORE TRANSPORT (Describe)

- ❑ Tocolytic agents
- ❑ Anticonvulsants
- ❑ Antihypertensive drugs
- ❑ Hemodynamic stabilization
- ❑ CPR
- ❑ Other (Describe)

98. PROCEDURES IN TRANSPORT (Describe)	**99. VITAL SIGNS IN TRANSPORT** (Describe)

100a. Is there documentation of family/children? ❑Yes ❑ No ❑ Unknown

100b. Is there documentation of bereavement support? ❑Yes ❑ No ❑ Unknown

101. WAS THIS TRANSPORT FOR RPICC SERVICES?

❑ Yes ❑ No ❑ Unknown ❑ N/A

Comments

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

LABOR & DELIVERY and IMMEDIATE POSTPARTUM
(Supplement with Hospitalization Tool as needed.)

102. ***LOCATION OF BIRTH***

- ❑ Hospital
- ❑ Home
- ❑ Birthing Center
- ❑ EMS Transport
- ❑ Non EMS Transport
- ❑ Other (Specify) _____
- ❑ No Source Data

103. ***PAYER SOURCE FOR L & D***

- ❑ Medicaid HMO
- ❑ Medipass
- ❑ Private Insurance
- ❑ Managed Care Organization (HMO, PPO, IPA, etc.)
- ❑ Self pay
- ❑ Other (Specify) _____
- ❑ No Source Data

104. TRANSPORTATION TO HOSPITAL OR BIRTHING CENTER

- ❑ EMS Team/Ambulance (If yes, complete transport abstraction form)
- ❑ Family or Friends Auto
- ❑ Drove Self
- ❑ Walked
- ❑ Bus or Cab
- ❑ EMS Helicopter
- ❑ Other (Specify) _____
- ❑ Unknown

105. ***LEVEL OF DELIVERY HOSPITAL***

❑ Level 1 ❑ Level 2 ❑ Level 3

106a. DATE OF ADMISSION

_____/_____/_____

106b. TIME OF ADMISSION

_____ **AM** or **PM** (Circle one)

106c. WEIGHT ON ADMISSION

_____pounds

106d. HEIGHT ON ADMISSION

_____inches

107. ADMISSION DIAGNOSIS/ CONDITION:
(Include vital signs & BP, /reflexes/LOC, urine)

_____
_____
_____
_____

REASON FOR ADMISSION:_____

_____
_____
_____
_____
_____

108. ONSET OF LABOR
(Include any information regarding symptoms/actions prior to admission, i.e. timing of contractions)

_____
_____
_____
_____

AM or **PM**
(Circle one)

109. STATUS UPON ARRIVAL TO DELIVERY SITE

- ❑ Stage 1 of Labor
- ❑ Stage 2 of Labor
- ❑ Stage 3 of Labor
- ❑ Scheduled C–Section
- ❑ Cervical Dilation _____cm
- ❑ Cervical Effacement _____%
- ❑ Delivered Place of delivery: _____

110. MEMBRANES

a. Did membranes rupture spontaneously prior to the onset of labor?	**b. Were membranes artificially ruptured?**
❑ Yes: Time_____ **AM** or **PM** (Circle one) ❑ No ❑ Unknown	❑ Yes: Time_____ **AM** or **PM** (Circle one) ❑ No ❑ Unknown

c. Were the membranes ruptured for a period of time longer than 24 hours prior to delivery?

❑ Yes ❑ No ❑ Unknown

111. *PRIMARY PROVIDER FOR L & D*

❑ Family Physician	❑ Licensed Midwife	❑ EMS Team	❑ Student (Specify)
❑ Obstetrician	❑ Physician Assistant	❑ Law Enforcement	❑ Other (Specify)
❑ Certified Nurse Midwife	❑ Nurse Practitioner	❑ None	❑ Alternative Practitioner (Specify)

112. OTHER PROVIDERS THAT ASSESSED MOTHER

❑ Internist	❑ Obstetrician	❑ Perinatologist	❑ Specialist (Specify)
❑ Other (Specify) _____	❑ None	❑ Doula	_____

113. *DURATION OF LABOR*

First Stage: # of hrs._____	**Second Stage: # of hrs._____**	**Third Stage: # of hrs._____**
❑ Normal (3-20 hours) ❑ Abnormal (<3 or >20 hours) ❑ Unknown	❑ Normal (0-2 hours) ❑ Abnormal (> 2 hours) ❑ Unknown	❑ Normal (0-30 minutes) ❑ Abnormal (>30 minutes) ❑ Unknown

114. SIGNIFICANT MEDICAL PROBLEMS DEVELOPED OR EXACERBATED DURING LABOR & DELIVERY

Medical Problem	**Comments** (Specify Problem, Date/Time developed and Treatment)
❑ Neuro/Psychiatric Diseases ❑ Cardiovascular Disease ❑ Respiratory Disease ❑ Gastrointestinal Disease ❑ Exacerbation of Endocrinologic/Metabolic ❑ Renal Disease ❑ Gynecological ❑ Musculoskeletal ❑ Exacerbation of Oncologic Disease ❑ Exacerbation of Genetic/Congenital Disorder ❑ Autoimmune/Rheumatologic ❑ Hematologic ❑ Trauma/Physical Injury ❑ Other Problems (Specify)_____	

115. SIGNIFICANT OBSTETRIC PROBLEMS DURING LABOR & DELIVERY

Obstetric Complications			**Placental Complications**	
❑ Pregnancy Induced HTN	❑ Uterine Hemorrhage (>500cc)	❑ Extension of Episiotomy	❑ Abruptio	❑ Retained Placenta
❑ Chorioamnionitis	❑ Amniotic Fluid Embolism	❑ Anesthesia Complication	❑ Praevia	❑ Manual Removal of Placenta
❑ Cervical/Vaginal Laceration	❑ Multiple Pregnancy	❑ Other	❑ Accreta	❑ Other (Specify) _____

116a. LABS **(Include admission/discharge pertinent findings. For extensive labs/procedures, use Hospitalization lab sheet. Or use back)**

Procedures: Ultrasound Report on admission:

116b. PLACENTA REPORT:

117a. *PRESENTATION* ❑ Vertex ❑ Breech ❑ Other

117b. *TYPE OF DELIVERY* (Check one only) **If Undelivered, check here_____**

❑ Primary C-Section-Planned	❑ Secondary C-Section-Unplanned
❑ Primary C-Section-Unplanned	❑ Vaginal
❑ Secondary C-Section-Planned	❑ Assisted Vaginal (Specify)_____

117c. DELIVERY DATE:_____ TIME:_____ AM or **PM** (Circle one)

118. REASON FOR C-SECTION (Check all that apply)

❑ Repeat	❑ Diabetes	❑ Placenta Previa
❑ Abruptio	❑ Failed Induction	❑ Prematurity
❑ Breech	❑ Failure to Progress/Descend	❑ Pre-eclampsia
❑ Congenital Anomalies	❑ Fetal Distress	❑ Other (Specify)_____
❑ Cord Prolapse	❑ Herpes	❑ Unknown
❑ CPD	❑ Malpresentation (other than breech)	❑ Not a C-Section Delivery

119. TYPE OF ANESTHESIA FOR DELIVERY (Check all that apply) ❑ **NONE**

❑ Local	❑ Epidural	❑ Narcotic Analgesia (Specify)_____
❑ Prudenal	❑ Spinal/Saddle Block	❑ Sedatives (Specify)_____
❑ Paracervical	❑ General Anesthesia	❑ Other (Specify)_____

120a. MEDICATIONS DURING L & D (Check all that apply) ❑ **NONE**

❑ Demerol	❑ Cephalosporin	❑ Gentamycin	❑ Blood products (Specify)_____
❑ Morphine	❑ Erythromycin	❑ Heparin	❑ Other (Specify)_____
❑ Apresoline	❑ Ergotrate	❑ Lasix	❑ Other (Specify)_____
❑ Vistaril	❑ Penicillin	❑ Kanamycin	
❑ Phenergan	☐ Oxytocin to Stimulate Labor	☐ Mg Sulfate: **Time started_____ Amt:_____**	
❑ Oxytocin to Augment Labor	☐ Oxytocin After Delivery		

120b. STATUS OF BABY: (Check one only) ***Gestational Weeks_____***

❑ **Fetal Demise** **Weight _____ Length _____ Head _____**
Comments/Description of fetus: _____
Was bereavement support documented? ❑ Yes ❑ No ❑ Unknown

❑ **Live Birth** **Weight _____ Length _____ Head _____**

Data on Infant Documented in Mother's Chart

Apgars:_____/_____/_____
Resuscitation Efforts: ❑ No ❑ Yes, by _____
Transferred: ❑ Newborn Nursery ❑ Newborn Intensive Care ❑ Other (Specify)_____
Is there documentation that mother saw or held infant? ❑ Yes ❑ No
Comments:

121. REFERRALS for postpartum or other care (Check all that apply) **Check here if none_____**

❑ Obstetrician
❑ Perinatologist
❑ Internist
❑ Specialist (Specify) _____
❑ Other (Specify) _____

122. OTHER

a. Did mother expire during L & D? ❑ Yes ❑ No ❑ Unknown
(If yes, describe events)

b. Is there documentation of follow-up/evaluation of children whose mother died during L & D?
❑ Yes ❑ No ❑ Unknown
(Describe)

c. If mother died, is there documentation of grief loss counseling to surviving family members?
❑ Yes ❑ No ❑ Unknown
(Describe)

Other comments regarding delivery:

123. VITAL SIGNS POSTPARTUM: **(Include temp., pulse, resp. and B/P. Expand on any abnormal findings.)**

1 hour:	**Day 1:**
2 hour:	**Day 2:**
3 hour:	**Day 3:**
4 hour:	**On Discharge:**

124a. POSTPARTUM COMPLICATIONS

- ❑ Hemorrhage (Amount_____ , H/H _____)
- ❑ Hematoma formation
- ❑ Excessive vaginal bleeding
- ❑ Postpartum infection
- ❑ Other (Specify)_____
- ❑ Other (Specify)_____

Treatments given for above problems:

124b. OTHER SIGNIFICANT HEALTH CONDITIONS (List & describe below)

125. NUTRITIONAL FACTORS PRESENT DURING ADMISSION

Factor	Care Plan	Referral	Services Received
125a. ☐ Weight loss during hospitalization	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
125b. ☐ Difficulty eating or swallowing	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
125c. ☐ Need for a special diet. (Specify type of diet)_____	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

125d. Was a nutritional assessment documented in the chart?	**125e. Was a referral to a registered dietitian ordered?**	**125f. Did the dietitian see the mother?**
☐ Yes ☐ No ☐ Unknown	☐ Yes ☐ No ☐ Unknown	☐ Yes ☐ No ☐ Unknown

126. PSYCHOSOCIAL ASSESSMENT

126a. Did this mother exhibit long bouts of depression following birth? ☐ Yes ☐ No
(If yes, describe below. Include treatments/referrals.)

126b. Was a case worker available on the unit for psychosocial assessment during hospitalization?	**126c. Did a case worker contact the mother during hospitalization?**
☐ Yes☐ No ☐ Unknown	☐ Yes☐ No ☐ Unknown

126d. Problems identified by medical, nursing or social work personnel during hospitalization: (If not documented, check here_____)

Problem Identified	Care Plan	Referral	Service Received
☐ Battered during pregnancy	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Bereavement support family	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Chronic illness (Specify)_____	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Communication barriers	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Crime/legal problems	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Depression	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Disability (Specify)_____	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Disturbed relationship with child	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Drug or alcohol abuse	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Employment/educational needs	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Housing inadequate/homeless	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Inadequate support systems	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Late life pregnancy (>39 years)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Mother abused as a child	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Need for financial support	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Poor nutrition	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Single mother	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Suicidal ideation	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Surviving children	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Teen mother (< 18 years)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Transportation problems	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Other (Specify)_____	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ None			

127. DISCHARGE PLANNING **Date of Discharge_____**

127a. Education documented during postpartum stay: ☐ Yes ☐ No (If yes, check below all that apply)

☐ Breastfeeding ☐ Infant Care ☐ Family Planning ☐ Self Care ☐ Other (Specify)_____

127b. ***Length of Hospital Stay*****:** _____days

Was mother breastfeeding? ❑ Yes ❑ No ❑ Unknown

127c. ***Did mother sign herself out against medical advice?*** ☐ Yes ☐ No ☐ Unknown ☐ N/A

127d. Hospitalization Outcome	☐ The patient expired. Date_____ Time_____	☐ The patient was discharged home. Date_____ Time_____	☐ The patient was discharged elsewhere. Date_____ Time_____	☐ Unknown

127e. If patient expired during postpartum period, summarize the events leading to her death.

127f. Was a discharge plan documented in the records?
☐ Yes ☐ No ☐ Unknown

127g. Was a follow-up medical visit scheduled? ☐ Yes ☐ No ☐ Unknown

127h. With whom was the follow-up visit scheduled?
☐ Private Physician
☐ Outpatient Clinic
☐ Hospital
☐ Other (Specify)_____

127i. REFERRALS: To outpatient follow-up with health or human services programs before discharge. (Check all that apply)

☐ Healthy Start Services☐ Nurse Home Assessment/ Follow-up	☐ Genetic Evaluation	☐ Employment Office	☐ Other Drug Treatment Programs
	☐ Family Planning	☐ Homemaker or Home Health Aides	☐ Child Protective Services
☐ Other Case Management	☐ Transportation	☐ Smoking Cessation Program	☐ Other (Specify)_____
☐ WIC	☐ Housing Authority	☐ Mental Health Services	☐ Other (Specify)_____
☐ Dietitian or Nutritional Counseling	☐ Group Shelters: Homeless or Battered (Circle one)	☐ Methadone Maintenance Program	☐ None

Comments:

(Note: For mothers requiring extensive hospitalization after delivery, supplement with Hospitalization tool to continue abstraction of postpartum period.)

PAMR Case #_____

FLORIDA DEPARTMENT OF HEALTH
PREGNANCY ASSOCIATED MORTALITY REVIEW
DATA ABSTRACTION FORM

TERMINAL EVENT/AUTOPSY FORM

128a. DATE OF DEATH ____/____/____

128b. TIME _____ **AM** or **PM**
(Circle one)

129. *WHEN MOTHER DIED*
❑ 1st Trimester ❑ 2nd Trimester
❑ 3rd Trimester ❑ Labor & Delivery ❑ Postpartum

130. AGE AT LAST BIRTHDAY_____

131. WHERE DID THE DEATH OCCUR?
❑ Automobile ❑ Hospice
❑ Birthing Center ❑ Hospital
❑ Medical Transport ❑ Work
❑ Home ❑ Other (Specify)_____

132. WEIGHT AT TIME OF DEATH?
_____lbs.
❑ No Source Data

133. HEIGHT AT TIME OF DEATH
_____inches
❑ No Source Data

134. RESUSCITATION ATTEMPT AT TERMINAL EVENT?
❑ Yes ❑ No ❑ No Source Data
If yes, included:

135. LAW ENFORCEMENT INVOLVED WITH THIS DEATH?
❑ Yes ❑ No ❑No Source Data
If yes, reason:

136. WHO CERTIFIED THE DEATH?
❑ Attending Physician
❑ Medical Examiner
❑ Other (Specify)_____

137. *WAS THE DECEASED SEEN BY MEDICAL PERSONNEL IN THE 24 HOURS PRIOR TO DEATH?*
❑ Yes
❑ No
❑ No Source Data

138. TO WHERE WAS THE DECEASED TRANSPORTED?
❑ Funeral Home
❑ Hospital
❑ Morgue
❑ Other (Specify)_____

139. NOTES

140a. *AUTOPSY OFFERED*
❑ Yes
❑ No

140b. *AUTOPSY PERFORMED*
❑ Yes By _____
❑ No Reason _____

141. ***MEDICAL EXAMINER CASE***	❑ Yes	❑ No

142a. AUTOPSY RESULTS

142b. Was Toxicology Report included? ❑ Yes ❑ No ❑ Result_____

143. CAUSE OF DEATH

Cause of Death from the Medical Record: **ICD Code**	**Cause of Death from Autopsy Report:** **ICD Code**
(a) Immediate	(a) Immediate
(b) Underlying	(b) Underlying
(c) Underlying	(c) Underlying
(d) Underlying	(d) Underlying

144. PROBABLE MANNER OF DEATH

❑ Accident	❑ Homicide
❑ Natural	❑ Suicide
❑ Undetermined	

145a. Documentation of grief support for family	❑ Yes	❑ No
b. Documentation of funeral assistance	❑ Yes	❑ No
c. Documentation of support/referrals for remaining children	❑ Yes	❑ No

Abstractor's Comments:

PREGNANCY ASSOCIATED MORTALITY REVIEW
Case Summary
(Revised 6/99)

CASE # Fictitious
Pregnancy Related
Interval between Date of Delivery and Date of Death: 0 days

INFORMATION FROM DEATH CERTIFICATE:
Demographics: 21, Jamaican, married, black, worked with plants, 12th grade education
Cause of Death: Complications of preeclampsia
Pregnancy Box Checked: Yes
Autopsy: Yes
Referred to Medical Examiner: No

COMMUNITY INFORMATION:
Community: Urban/Rural
Estimated distance from home to nearest Level III delivering facility: 5 miles

Case Summary Synopsis:
She was 21 years old, black, with 12 years of education, worked with plants, married, gravida 1, para 0. She died 4 hours after delivery; cause of death was complications of preeclampsia. Medical history was unremarkable. Entry for prenatal care was at 28 weeks, with 8 visits to an obstetrician at a clinic. Prenatal history was significant for hypertension. She was started on Procardia during the third trimester. She was referred to WIC during the prenatal period. Delivery method was primary C/section performed by an obstetrician under general anesthesia. Obstetric complications included elevated BP, which was stabilized after delivery. Infant was 38 weeks gestation, weighed 7 pounds, and suffered no complications from the birth. Autopsy was done in the hospital. Significant findings included no anatomic cause of death.

1. GENERAL HISTORY

General History: Allergic to Penicillin
No other problems documented
Immunization History: No Source Data
Sexual History: Sexually active at age 17
No history of STDs or herpes
Obstetrical History:
a. Contraceptive: None
b. Breastfeeding: N/A
c. Births over 9 pounds: No
d. Menstrual Cycle: Age 14, regular
e. Previous Pregnancy Problems: N/A

2. PRENATAL CARE RECORD (Partial, unable to access record)

Provider: Obstetrician

Prenatal Care: Yes
Payer: Medicaid
First Visit: 1/18 at 28 weeks
Last Visit: 4/24 at 38 weeks
Location: Clinic
Number of Prenatal Visits: 8
Last Menstrual Period: **7**/19/96
EDD by Dates: 4/22
EDD by Sonogram: Unknown
Gravida: 1 Para: 0
Maternal or Infant Genetic Problems: No Source Data
Previous Pregnancy History: N/A
HIV: Not on AZT
Laboratory Screening Tests: O+, RPR, GC, Antibody test, Chlamydia**,** sickle cell within normal limits
Other and Repeated Labs: H/H 11.3/35 at 32 weeks
Procedures: AFP, Glucose within normal limits
Medications: Started on Procardia 30 mg XL in third trimester for BP control

Information on prenatal visits:

Date	Weeks	Fundal Ht.	Weight	BP	FHT	Procedures	Comments
1/18	28-9	24cm	189	140/90	+		F/u 2 weeks
2/9	30	26	191	142/88	+	Sono done	F/u 2 weeks
3/7	32	30	195	144/110 140/90	+	24 hr. urine for protein & creatinine clearance	
3/16	33	31	199	138/92	+	Started on procardia	
4/1	35	33	205	154/100	140	Urine n/n	c/o headache, no edema
4/8	36+	35	204	140/98	152	Urine n/n	+1 pedal edema
4/15	37	36	205	154/98	142	Urine n/n	+1 pedal edema
4/24	38	36	206	142/92	136		+2 pedal edema, sent to hospital

3. LABOR AND DELIVERY RECORD

Location: Hospital
Payer: Medicaid
Level of Hospital: I
Date/Time of Admission: 4/24 at 11:30 a.m.
Admitting Diagnosis: Pregnancy induced hypertension
Onset of Labor: Unknown
Status upon Arrival: BP 140/90 – 150/95, bilateral pedal edema, mild hyperreflexia, trace proteinuria. VE 4 cm, 100% effaced, vertex.
Comments: Notation of swelling in face and hands
Primary Provider for Labor and Delivery: OB

Other Providers: Perinatologist
Duration in Labor: Unknown
Repeat labs: WBC 20.95 H/H 11/33, plts. 240,000
Type of Delivery: Primary C/section without labor trial, 4/24 at 1230
Reason: Preeclampsia
Anesthesia: General
Medications: MgSO4 for seizure precautions
Comments: During delivery BP normalized with diastolic < 110. On MgSO4 2 grams/hour for prophylaxis for preeclampsia. BP end of surgery 130/70.
Status of Baby: Live Birth
Weight: 3179 (7 pounds), **Apgars** 8/9
Cord pH 7.39, baby transferred to newborn nursery
After delivery, mother extubated and transferred to postpartum floor
Postpartum Vital Signs:

1300	pulse 120	resp. 40	BP 140/80
1400	pulse 128	resp. 54	BP 138/78
1500	pulse 130	resp. 40	BP 140/80
1600	pulse 110	resp. 45	BP 135/78

Medications: Plan to receive MgSO4 x 24 hours post C/section
Summarization of events prior to demise:
1630: On Desaturations noted to 80. Given face mask FIO2 with increase to 85 noted. Pulse 140, BP 150/100 respirations labored at 55.
1635: OB called. Will be in hospital in 15 minutes.
1640: Complaints of dizziness and shortness of breath. Coded. ER doctor at bedside. Intubated. Unable to revive after CPR and 4 rounds of ACLS medications.

TERMINAL EVENT

Date/Time of Death: 4/24 at 1730
Place of Death: Hospital
Weight: 200 pounds **Height:** 63 inches
Resuscitation: Attempted without success
Certifier of Death: MD
Medical Provider 24 Hours before Death: Yes
Autopsy: Yes, in hospital
Cause of Death: History of hypertension, preeclampsia, and obesity. No anatomic cause of death found.
Medical Examiner Case: No

4. POSTPARTUM (AFTER DISCHARGE): N/A

5. NUTRITION ISSUES

Height: 63 inches
Pre-pregnancy Weight: 175 **Recent Weight Change:** unknown
Prenatal Weight Gain: 35 pounds by 38 weeks

Weight after Delivery: 200 pounds
Nutritional Issues: Prenatal referral to WIC. No other documentation of nutritional issues.

6. PRENATAL CARE

Prenatal Care: Yes
First visit: 11/18 at 28 weeks
Last visit: 4/24 at 38 weeks
Location: Clinic
Number of Prenatal Visits: 8

7. SUBSTANCE USE

Tobacco: Denied
Alcohol: Denied
Other substances: Denied

8. PRENATAL RISK ASSESSMENT

Prenatal Healthy Start Screen given, scored 3. Referred for Healthy Start care based on other factors (obesity). Received 4 phone calls, 2 home visits and referral to WIC.

9. SOCIAL SUPPORT

Husband and sister noted as visitors. No family assessment or further mention of infant's status noted in mother's records.

10. HOUSING

No Source Data

11. MENTAL HEALTH

No Source Data

12. FAMILY VIOLENCE OR NEGLECT

No Source Data

13. SOCIAL ISSUES

No Source Data
Payer source: Medicaid

14. TRANSPORTATION

No Source Data

15. PROVISION OF SERVICES

Referrals:

Prenatal: WIC
L&D: None

Education: No documentation of prenatal education
Documentation of Bereavement/Grief Support to Family: Yes. Emotional support given. Husband and sister in. Chaplain called for support.

16. ENVIRONMENTAL OR OCCUPATIONAL HAZARDS

Employed in plant sales. Exposure unknown.

17. FAMILY PLANNING

History of condom use prior to pregnancy.

18. MISCELLANEOUS INFORMATION

Records abstracted: Labor and Delivery, Autopsy, Partial Prenatal, Healthy Start
Unable to access records: Provider refused access to prenatal record.

Appendix F

Example of Questionnaire for Interviews after Pregnancy-Related Deaths

Reproduced with permission from the New York State Department of Health.

This questionnaire was developed by the New York State Department of Health.

Two versions of a questionnaire are included. The first can be used if the husband or partner is interviewed, and the second if another family member or friend is interviewed.

Interview with husband or partner ***Client ID #:_____***

Before we begin the interview, we really want to thank you again for your help in this research project. We know that speaking about _____may be emotional, and if at any time during the interview you would like to take a break or stop the interview, please just let me know. The reason we have asked you to participate in this study is that by speaking with you and others in similar circumstances, we will be better able to develop programs to prevent premature deaths in young women. I want to emphasize that everything we talk about today is completely confidential. There are no right or wrong answers in this survey, and it is perfectly fine if you don't know the answer to a question. If you don't understand a question, please ask me to explain exactly what I mean. We'll begin with some questions about you and your relationship with ____ and then we'll talk more specifically about ___. Unless there is something that you would like to ask me now, let's get started.

---

1. What was your relationship to _____?
   a) husband How long were you married? _____ years
   b) boyfriend
   c) live in partner/common law spouse
   d) other (specify)_____

2. What is your marital status?
   a) single, never married
   b) married
   c) widowed
   d) divorced
   e) separated

3. How would you best describe your racial background?
   a) Caucasian
   b) Black
   c) Asian, Pacific Islander
   d) Native American
   e) Other

4. Are you of Spanish or Latino ancestry?
   ____Yes _____No

   If no, go to question 7.

5. If you were born outside of the United States, what country were you born in _____

6. How long did you know _____? _____months _____years?

If the respondent was not the husband of ____, ask question 7, otherwise, go to question 9.

7. Were either of you legally married to anyone else for the last year of her life?
   _____Yes _____No

8. Was she ever married before? _____Yes _____No

   If no, go to question 10.

9. How many times total was she married? _____

10. Did you live together during the last year of her life? _____Yes _____No

If yes, go to question 15.

11. Where did you live in relation to _____ ?
    a) next door
    b) same apartment building or complex
    c) same street
    d) same neighborhood
    e) same city
    f) within the state
    g) different state
    h) different country

12. During the last year of _____s life, how often did you see her?_____

13. How did you keep in contact with _____? (check all that apply)
    a) in person
    b) by telephone
    c) by mail
    d) other (please specify) _____

14. How would you describe your relationship with _____?
    a) very close
    b) somewhat close
    c) not close

15. What is the highest grade or year of school that you have completed?
    _____

16. Are you currently employed? ____Yes ____No

If no, go to question 18.

17. What is your occupation? _____

18. Did you have a job in the last year of _____'s life?
    ____Yes ____No

If no, go to question 20.

19. What was your occupation then? _____

20. Please tell me if you received money from any of the following sources to support yourself in the last year of _____ life.
    a) wages or pay from a job
    b) benefits such as AFDC__ Welfare__ General Assistance__ Food Stamps/SSI__
    c) unemployment benefits
    d) child support or alimony

e) Social Security
f) Worker's Compensation
g) Veteran's benefits or pensions
h) family
i) friends
j) other

21. Would you be willing to share with me an estimate or your annual income? _____Yes ____No

If no, go to question 24.

22. What was your total income for the past twelve months before taxes? Include all sources of income

(Ranges in increments of $20,000 e.g <$20K, $20-$40K, $60-$80K, $80K+)

$_____

23. Was that similar to your income in the previous twelve months?
___Yes ___No

Now we would like to talk more specifically about _____.

24. How did she describe her racial background?
a) Caucasian
b) Black
c) Asian, Pacific Islander
d) Native American
e) Other *(specify):*_____

25. What was the first language she learned to speak as a child?
a) English *(skip to q27)*
b) Spanish
c) Other *(specify):* _____

26. Would you say that she:
a) spoke English well
b) spoke little English
c) spoke no English at all

27. What country was _____ born in? _____

If U.S., go to question 29.

28. How long did ___ live in the United States? _____

29. What was _____'s religion?
a) Catholic
b) Jewish

c) Protestant
d) Moslem/Muslim
e) No religion *(skip to q31)*
f) Other *(specify):* _____

30. Was she active in her place of worship? ____Yes _____No

31. Was _____ involved in other community organizations? ____Yes ____No

32. What was the highest grade or year of school that _____ completed?
_____

33. What city or town did _____ live in for the last year of her life? _____

34. What type of housing did _____ live in for the last year of her life?
a) private house
b) apartment building or complex
c) housing project
d) homeless shelter
e) residential program for drug or alcohol treatment
f) institution please specify_____
g) homeless

35. On a scale of one to five, how would you rate the safety of the neighborhood she lived in, with one being very dangerous and five being very safe? _____

Now I would like to ask you some questions about ____'s income

36. In the year before she died, did _____ have a job? _____Yes _____No

If no, go to question 38.

37. What type of work was she doing? _____

38. Again, I am going to list a number of ways that people support themselves. Please tell me if you know if _____ received money from any of the following sources to support herself in the last year of her life.
a) wages or pay from a job
b) benefits such as AFDC_, Welfare_, General Assistance_, Food Stamps_ or SSI_
c) unemployment benefits
d) child support or alimony
e) Social Security, Worker's Compensation, Veteran's benefits or pensions
f) family
g) friends
h) other

39. Would you be willing to share with me an estimate of _____s annual income?
____Yes ____No

If no, go to question 42.

40. What was her total income for the last twelve months of her life before taxes?

(Ranges in increments of $20,000 e.g <$20K, $20-$40K, $60-$80K, $80K+)

$_____

41. Was that similar to her income in the previous twelve months?
_____Yes _____No

42. How did ____ die?

_____
_____

43. Do you know if _____ was pregnant at any time during the last year of her life?
____Yes _____No

44. Did ___ have any chronic health problems (such as diabetes, hypertension)?
___ Yes (describe _____)
___ No

45. Did ___ ever have a serious infection such as pneumonia, Lyme disease, TB or an STD?
___ Yes *If yes, specify* _____
___ No

46. Did _____ have any disabilities?
___ Yes (describe _____)
___ No

47. Was _____ ever diagnosed with mental illness?
___ Yes (define _____)
___ No

If no, go to question 52.

48. Did she receive treatment for the mental illness? _____Yes _____No

49. What type of treatment did she receive
a) medication
b) counseling
c) electric shock therapy
d) short-term hospitalization *(<1 month)*
e) long-term hospitalization
f) other *(specify):*_____

50. Do you know if _____ followed her doctor's treatment for her mental illness?
_____Yes _____No

51. How long before _____ died did she develop mental illness? _____

52. Was there ever a time when _____ needed to go to the doctor or the hospital for any reason, but did not go? _____Yes _____No

If yes, why didn't she go?_____

Now I am going to ask you some questions about some things that _____ may or may not have done that could have affected her health.

53. Did she ever smoke cigarettes? _____Yes _____No

If no, go to question 56.

54. Did she smoke cigarettes during the last year of her life? _____Yes _____No

If no, go to question 56.

55. Approximately how many cigarettes per day did _____ smoke during the last year of her life? _____

56. Did she drink alcohol? _____Yes _____No

If no, go to question 58.

57. Approximately how many alcoholic drinks did ____ have in average week during her last year of life?
(A drink is one glass of wine, one wine cooler, one can or bottle of beer, one shot of liquor or one mixed drink) _____

58. Some women use drugs (prescribed or otherwise) for reasons other than to treat illnesses (e.g. stress, weight loss, socially). Did _____ use drugs for similar reasons?
_____Yes _____No
If no, go to question 62.

59. Which of the following drugs did ___ use: *(Circle all that apply)*
a) marijuana or hashish
b) cocaine-nasal
c) cocaine-injected
d) crack, heroin
e) PCP, angel dust, LSD
f) barbiturates
g) methadone
h) prescription sedatives

i) prescription diet pills
h) Other non prescribed drugs *(specify):* _____

60. How long had she been using drugs before she died? _____

61. Did she use drugs during the last year of her life? _____Yes _____ No

.

Now I would like to talk about _____'s pregnancy history.

62. How many times all together was _____ pregnant? _____
If none, go to question 75.

63. How many children did she have altogether? _____
If none, (all pregnancies ended in spontaneous or induced abortion, go to q75)

64. What were their ages and genders? *(e.g. 13/M)*
_____

65. Did any of her pregnancies end in: *(indicate how many of each)*
a) miscarriage (less than 5 months)
b) abortion
c) still birth / late miscarriage
d) ectopic pregnancy (a pregnancy in her fallopian tubes)

Now I would like to talk a bit about _____s children.

66. Were all of her children living with her at the time of her death? _____Yes _____No
If yes, go to question 68.

67. What were the living arrangements of those children who lived away from _____?
a) living with another relative
b) living with a friend
c) foster care
d) adopted
e) runaway
f) living independently
g) other *(specify):*_____

68. Have any of _____'s children been very sick or badly injured?
_____Yes _____No
If no, go to question 72.

69. Were they sick before or after her death?
a) before
b) after *If after, go to question 75.*

70. Were they sick in the last year of her life? _____Yes _____No

71. What illness(es) did he/she/they have? _____

72. Have any of _____'s children died? _____Yes _____No
If no, go to question 75.

73. When did he/she/they die ?
a) before
b) after

74. What caused his/her/their death(s)? _____
_____

Now I have some questions about ____ last pregnancy of mm/dd/yy.

75. Were you the father in that pregnancy (reiterate date mm/dd/yy)?
____Yes _____No
If no, ask question 76, but skip questions 77 through 83.

76. Would you say that _____planned to get pregnant?
a) planned
b) did not plan

77. Before ___ got pregnant, did the two of you use any birth control method to prevent pregnancy?
____Yes ____No
If no, go to question 79; If yes, skip question 79

78. What method of birth control did you use? _____

79. Why were you not using birth control? _____

80. Did **<u>you</u>** want to have a child at the time? ___Yes ____No
If yes, go to question 83.

81. Why didn't you want to have a child?_____

82. What did **you** want ____ to do about the pregnancy when you learned that she was pregnant?
_____

83. Did the two of you make plans together to have a baby?
____Yes ____No

84. What was the outcome of _____'s last pregnancy of mm/dd/yy?
    a) fetal death
    b) live birth
        _full term baby
        _premature baby
    c) still birth (>20wks)
    d) miscarriage (<20wks)
    e) induced abortion
    f) ectopic pregnancy
    g) other *(specify):*_____

If the deceased had a live birth or a fetal death, continue with question 85.
If she had any other outcome, go to question 87.

85. Did ____ consider having an abortion or putting the child up for adoption?
    ____Yes ____No

86. If she considered abortion, what kept her from doing that?
    _____

87. On a scale of 1 to 5, with 1 being strongly negative and 5 being strongly positive, what was _____'s reaction when she learned that she was pregnant?_____
88. Did _____ receive prenatal care during her pregnancy?
    _____Yes ____No
    If yes, go to question 90.

89. Why didn't she receive prenatal care? _____

90. What month did she begin to receive that care?
    (*If ≥ 5 , why didn't she receive care sooner?)*_____
_____

91. Where did she go for prenatal care?
    a) Clinic
    b) HMO
    c) Private office
    d) Birthing Center
    e) Emergency room

92. Do you know how many prenatal; visits she had altogether?
    a) 1-3
    b) 4-6
    c) 7+
    d) don't know

93. Did she find it difficult to keep her prenatal appointments?

____Yes ____No

If no, go to question 95.

94. What was the reason for difficulty?

a) child care
b) job
c) transportation
d) illness
e) other *(specify):*_____

95. How did she pay for prenatal visits?

a) self pay
b) private insurance
c) friend/relative paid
d) Medicaid / PCAP
e) unable to pay
f) other (*specify):*_____

96. Did _____ receive WIC during her pregnancy?

97. Did she experience any special medical problems during her pregnancy that made it necessary for her to see a specialist?

____Yes ____No

98. Many families and communities have traditions for pregnant women. Did ___ do any special things or see any special healers while she was pregnant?

___Yes *(specify):*_____ ____No

If the deceased died during pregnancy, go to question 109 . ;
If the deceased died during birth, or before she was discharged from the hospital, skip questions; 103-108.

99. What was the date of the baby's birth (or termination of pregnancy)? ___/___/___

100. If this pregnancy ended in a birth/stillbirth, indicate delivery type:

a) normal vaginal
b) complicated vaginal
c) c-section
d) other *(specify)*:_____

101. If this pregnancy ended in abortion, indicate type:

a) spontaneous miscarriage

b) surgery for ectopic pregnancy
c) abortion, licensed provider
d) abortion, unlicensed provider
e) other (*specify):*_____

102. How many months pregnant was ____ at the time of delivery or termination of pregnancy? _____months

103. After the pregnancy, did ____ keep her routine follow-up appointments?
____Yes ____No

104. Did ___ experience any medical complications after the baby was born/ the abortion?
____Yes ___No
If no go to question 109.

105. Did ____ go to a doctor to treat the complications? _____Yes _____No
If yes, go to question 109.

106. Why didn't she go to a doctor to treat the complications?
a) lack of money
b) transportation
c) child care
d) other (*specify):*_____

107. Did the problems go away after treatment? ____Yes ___No

108. Did ____ complain about excessive pain or discomfort after the baby was born/ the abortion?
___Yes ____No

109. The next set of questions is about events that may have happened to _____ in the last year of her life. I will read you a list of items and for each tell me whether or not it happened during this time in her life.

a) Did she move apartments or houses?	Y	N
If yes, how many times did she move? _____		
b) Was she ever homeless?	Y	N
c) Did she get very sad or depressed?	Y	N
d) Did a close friend or family member become very sick or die?	Y	N
e) Did she lose her job?	Y	N
f) Did anyone hit, punch or kick her?	Y	N
*If yes, who?*_____		
g) Was she the victim of a crime?	Y	N
*If yes, what type of crime?*_____		
h) Was she arrested?	Y	N
*If yes, for what?*_____		

i) Was she involved in a gang? Y N

110. Did any other difficult event take place? please specify _____

111. Is there anything else you would like to share with me about _____?

_____

_____

112. Finally, do you have any advice about helping families who experience a loss similar to yours?

_____

_____

_____

Completed by: _____ Date: _____/_____/_____

Interview for family member or friend ***Client ID#:_____***

Before we begin the interview, we really want to thank you again for your help in this research project. We know that speaking about _____may be emotional, and if at any time during the interview you would like to take a break or stop the interview, please just let me know.

The reason we have asked you to participate in this study is that by speaking with you and others in similar circumstances, we will be better able to develop programs to prevent premature deaths in young women.

I want to emphasize that everything we talk about today is completely confidential. There are no right or wrong answers in this survey, and it is perfectly fine if you don't know the answer to a question. If you don't understand a question, please ask me to explain exactly what I mean. Unless there is something that you would like to ask me now, lets get started.

---

1. What was your relationship to _____
   a) mother
   b) father
   c) brother
   d) sister
   e) friend
   f) other *(specify):*_____

2. How would you best describe your racial background
   a) Caucasian
   b) Black
   c) Asian, Pacific Islander
   d) Native American
   e) Other *(specify):*_____

3. Are you of Spanish or Latino ancestry? _____Yes _____No
   If no, go to question 6.

4. What group best describes your ancestry, please be specific
   a) American
   b) African *please specify country*_____
   c) Caribbean *please specify country*_____
   d) Asian *please specify country* _____
   e) European *please specify country* _____

6. If you weren't born in the US, what country were you born in? _____

Now I would like to ask you some more questions about your relationship with _____.

7. How long did you know _____? _____years _____ months

8. Where did you live in relation to_____?
   a) next door
   b) same apartment building or complex
   c) same street
   d) same neighborhood
   e) same city
   f) within the state
   g) different state
   h) different country

11. During the last year of her life, how often did you see _____?
   _____

12. How did you keep in contact with_____ *(circle all that apply)*
   a) in person
   b) by telephone
   c) by mail
   d) other *(specify):* _____

13. How would you describe your relationship with _____?
   a) very close
   b) somewhat close
   c) not close

14. What is the highest grade or year of school that you have completed?
   _____

15. Are you currently employed? ____Yes ____No
   If no, go to question 17.

16. What is your occupation _____

17. Did you have a job in the last year of _____s life? ____Yes ____No
   If no, go to question 19.

18. What was your occupation then? _____

19. Please tell me if you received money from any of the following sources to support yourself in the last year of _____'s life.
   a) wages or pay from a job

b) benefits such as AFDC_ Welfare_ General Assistance_ Food Stamps/SSI_
c) unemployment benefits
d) child support or alimony
e) Social Security
f) Worker's Compensation
g) Veteran's benefits or pensions
h) family
i) friends
j) other

20. Would you be willing to share with me an estimate or your annual income?
____Yes ____No
If no, go to question 23.

21. What was your total income for the past twelve months before taxes?
Include all sources of income
(Ranges in increments of $4,999 e.g.15,000-19,999)
$_____

22. Was that similar to your income in the previous twelve months?

Now we would like to talk more specifically about _____.

23. How did she describe her racial background?
a) Caucasian
b) Black
c) Asian, Pacific Islander
d) Native American
e) Other *(specify):*_____

24. Was she of Spanish or Latino ancestry?
If no, go to question 26.

26. What group best describes _____s ancestry, please be specific
a) American
b) African (please specify_____)
c) Caribbean (please specify_____)
d) Asian (please specify_____)
e) European (please specify_____)

27. What was the first language she learned to speak as a child?
a)English
b) Spanish
c) Other *(specify)*: _____

28 Would you say that she
   a) spoke English well
   b) spoke little English
   c) spoke no English at all?

29. What country was _____ born in? _____
   If U.S., go to question 31.

30. Did she live in the United States with or without official documentation?
   ____Yes ____No

31. What was _____s religion?
   a) Catholic
   b) Jewish
   c) Protestant
   d) Moslem/Muslim
   e) No religion
   f) Other *(specify)*: _____

32. Was she active in her place of worship (if applicable)? ____Yes ____No

33. Was _____ involved in other community organizations? ____Yes ____No

34. What was the highest grade or year of school that _____ completed?
   _____

35. What city or town did _____ live in for the last year of her life?
   _____

36. What type of housing did _____ live in for the last year of her life?
   a) private house
   b) apartment building or complex
   c) housing project
   d) homeless shelter
   e) residential program for drug or alcohol treatment
   f) institution *(specify):*_____
   g) homeless

37. On a scale of one to five, how would you rate the safety of the neighborhood she lived in, with one being very dangerous and five being very safe? _____

Now I would like to ask you some questions about ____'s income

38. In the year before she died, did _____ have a job? ____Yes ____No
   If no, go to question 40.

39. What type of work was she doing? _____

40. Again, I am going to list a number of ways that people support themselves. Please tell me if you know if _____ received money from any of the following sources to support herself in the last year of her life.
    a) wages or pay from a job
    b) benefits such as AFDC _, Welfare _, General Assistance _, Food Stamps or SSI_
    c) unemployment benefits
    d) child support or alimony
    e) Social Security, Worker's Compensation, Veteran's benefits or pensions
    f) family
    g) friends
    h) other

41. Would you be willing to share with me an estimate of _____s annual income? ____Yes ____No
    If no, go to question 43.

42. What was her total income for the last twelve months of her life before taxes?
    Include all sources of income. $_____

43. Was that similar to her income in the previous twelve months?
    ____Yes ____No

44. How did ____ die?

_____
_____

4Do you know if _____ was pregnant at any time in the last year of her life?
_____Yes ____No

46. Did _____ have any chronic health problems? ____Yes ____No

47. Did ___ ever have a serious infection such as pneumonia, Lyme disease, TB, STD?

48. Did ___ have any disabilities?

49. Was _____ ever diagnosed with mental illness? ____Yes ____No
    Define_____

49. Did she receive treatment for the mental illness? ____Yes ____No

50. What type of treatment did she receive
    a) medication
    b) counseling
    c) electric shock therapy

d) short-term hospitalization
e) long-term hospitalization

51. Do you know if _____ followed her doctor's treatment for her mental illness? ____Yes ____No

52. How long before _____ died did she develop mental illness? _____

53. Was there ever a time when _____ needed to go to the doctor or the hospital for any reason, but did not go? ____Yes ____No

If yes, why didn't she go? _____

Now I am going to ask you some questions about some things that _____ may or may not have done that could have affected her health.

55. Did she ever smoke cigarettes?
____Yes ____No
If no, go to question 58.

56. Did she smoke cigarettes during the last year of her life? ____Yes ____No
If no, go to question 58.

57. Approximately how many cigarettes per day did _____ smoke during the last year of her life? _____

58. Did she drink alcohol?
____Yes ____No
If no, go to question 64.

59. Approximately how much alcohol did ____drink per week during her last year of life?
_____

60. Some women use drugs for reasons other than to treat illnesses. Did ____ use drugs for similar reasons?
____Yes ____No
If no, go to question 64.

61. How long had she been using drugs before she died? _____

62. Did she use drugs during the last year of her life? ____Yes ___No
If no, go to question 64.

63. Which of the following recreational or street drugs did ____use: (*Circle all that apply)*
a) marijuana
b) cocaine-nasal
c) cocaine-injected
d) crack, heroin
e) PCP

f) barbiturates
g) methadone
h) other non prescribed drugs *(specify):*_____

Now I would like to talk about _____'s pregnancy history.

63. How many times all together was _____ pregnant? _____
If none, go to question 77.

64. How many children did she have all together? _____

65. What were their ages and genders? *(e.g. 13/M)*
_____

66. Did any of her pregnancies end in: *(indicate how many of each)*
a) miscarriage (less than 5 months)
b) abortion
c) still birth
d) ectopic pregnancy (a pregnancy in her fallopian tubes)

Now I would like to talk a bit about _____s children.

67. Were all of her children living with her at the time of her death? _____Yes _____No
If yes, go to question 73.

68. What were the living arrangements of those children who lived away from _____?
a) living with another relative
b) living with a friend
c) foster care
d) adopted
e) runaway
f) living independently
g) other *(specify):*_____

69. Have any of _____'s children been very sick? _____Yes _____No
If no, go to question 77.

70. Were they sick before or after her death?
a) before
b) after ***If after, go to question 72.***

71. Were they sick in the last year of her life? _____Yes _____No

72. What illness(es) did he/she/they have? _____

73. Have any of _____'s children died? _____Yes _____No
If no, go to question 77.

74. Did he/she/they die before or after her death?
    a) before
    b) after ***If after, go to question 76.***

75. Did he/she/they die during the last year of her life? _____Yes _____No

76. What caused his/her/their death(s)?_____

Now I have some questions about ____ last pregnancy of mm/dd/yy.

77. Would you say that _____ planned or did not plan to get pregnant?
    a) planned ***If planned, go to question 82.***
    b) did not plan

78. Do you know if _____ was using birth control before she got pregnant?
    ____Yes *(specify method if known):*_____
    ____No

79. What was the outcome of this last pregnancy *(dated mm/dd/yy)*?
    a) fetal death
    b) live birth
        full term baby
        premature baby
    c) still birth (>20wks)
    d) miscarriage (<20wks)
    e) induced abortion
    f) ectopic pregnancy
    g) other_____

If the deceased had a live birth or a fetal death and the answer to question 77 was "not planned", continue. If she had any other outcome, go to question 82.

80. Did she consider having an abortion or placing the child up for adoption?
    ____Yes ____No

81. If she considered an abortion, what kept her from doing that? _____
    _____

82. On a scale of one to five, with one being strongly negative and five being strongly positive, how did _____ react when she learned she was pregnant? _____

83. Did _____ receive prenatal care during her pregnancy? _____Yes _____No

If no, go to question 90.

84. Do you know what month of her pregnancy she began to receive that care?
    ____Yes _____month _____No

85. Where did she go for prenatal care?
    a) Clinic
    b) HMO
    c) Private office
    d) Birthing Center
    e) Emergency room

86. Do you know how many prenatal; visits she had altogether?
    a) 1-3
    b) 4-6
    c) 7+
    d) don't know

87. Did she find it difficult to keep her prenatal appointments?
    ____Yes ____No
    If no, go to question 89.

88. What was the reason for difficulty?
    a) child care
    b) job
    c) transportation
    d) illness
    e) other *(specify):*_____

89. How did she pay for prenatal visits?
    a) self pay
    b) private insurance
    c) friend/relative paid
    d) Medicaid
    e) unable to pay
    f) other (*specify):*_____

90. Did _____ receive WIC during her pregnancy? ___Yes ___No

91. Did she experience any special medical problems during her pregnancy that made it necessary for her to see a specialist?
    ____Yes ____No

92. Many families and communities have traditions for pregnant women. Did ___ do any special things or see any special healers while she was pregnant?
    ___Yes *(specify):*_____ ____No

If the deceased died during birth or before she was discharged from the hospital, skip questions 98 - 104.

93. What was the date of the baby's birth or termination of pregnancy? ___/___/___

95. If this pregnancy ended in a birth/still birth of her child, indicate delivery type
    a) normal vaginal
    b) complicated vaginal
    c) c-section
    d) other *(specify)*:_____

96. If this pregnancy ended in an abortion, indicate type
    a) spontaneous miscarriage
    b) surgery for ectopic pregnancy
    c) abortion, licensed provider
    d) abortion, unlicensed provider
    e) other (*specify):*_____

97. How many months pregnant was ____ at the time of delivery or termination of pregnancy?
    _____months

98. Did ____ keep her routine postpartum appointments? ____Yes ____No

99. Did ___ experience any medical complications after the baby was born?
    ____Yes ___No
    If no go to question 105.

100. Did ____ go to a doctor to treat the complications? _____Yes _____No
    If yes, go to question 102.

101. Why didn't she go to a doctor to treat the complications?
    a) lack of money
    b) transportation
    c) child care
    d) other (*specify):*_____

102. Did the problems go away after treatment? ____Yes ___No

103. Did _____ have trouble sleeping after the baby was born? _____Yes ___No

104. Did ____ complain about excessive pain or discomfort after the baby was born?
    ___Yes ____No

105. The next set of questions is about events that may have happened to _____ in the last year of her life. I will read you a list of items and for each tell me whether or not it happened during this time in her life.

a) Did she move apartments or houses?	Y	N
If yes, how many times did she move? _____		
b) Was she ever homeless?	Y	N
c) Did she get very sad or depressed?	Y	N
d) Did a close friend or family member become very sick or die?	Y	N
e) Did she lose her job?	Y	N
f) Did anyone hit, punch or kick her?	Y	N
*If yes, who?*_____		
g) Was she the victim of a crime?	Y	N
*If yes, what type of crime?*_____		
h) Was she arrested?	Y	N
*If yes, for what?*_____		
i) Was she involved in a gang?	Y	N

106. Did any other difficult event take place? please specify_____

107. Is there anything else you would like to share with me about _____
_____
_____

108. Finally, do you have any advice about helping families who experience a loss similar to yours?
_____
_____
_____
_____

Completed by: _____
Date: _____/_____/_____

Appendix G

Extracts from "State Level Expert Review Committees—Are They Protected?"

Excerpted, with permission from Ronald F. Wright, from Public Health Reports 1990:105;13-23.

State Level Expert Review Committees—Are They Protected?

Ronald F. Wright, J.D.
Jack C. Smith, M.S.

For years state maternal mortality review committees have made an important contribution to maternal health in our nation. More recently, however, many of these committees have become inactive. Representatives of the American College of Obstetricians and Gynecologists, State health departments, and State medical societies attribute the decline in committee activity in large part to legal concerns, such as the liability of committee members and the use of committee proceedings in litigation.

State-level investigation of maternal deaths is the keystone to the national epidemiologic surveillance of maternal mortality conducted by the Centers for Disease Control, Public Health Service. Because State review committees traditionally carry out these investigative functions, the decline in committee activity has proved to be problematic. …

Although specific concerns regarding maternal mortality review committees prompted this report, the results apply more broadly to other expert committees, such as infant and perinatal mortality review committees, that are established to conduct morbidity and mortality investigations aimed at improving the public's health. …

Background

The 1990 Health Objectives for the Nation, promulgated by the Public Health Service, emphasized the need to reduce the maternal mortality rate in the United States.[1] In recent decades, remarkable progress has been made in reducing deaths due to pregnancy and childbearing. However, because the maternal mortality rate has shown little decline in the 1980s,[2] current projections for 1990 indicate that the intended objective of no more than five deaths per 100,000 live births for any county or for any ethnic group will not be met.[3]

To further reduce maternal mortality, the Federal Government in 1987 initiated National Pregnancy Mortality Surveillance. This ongoing surveillance is conducted by the Division of Reproductive Health of the Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control (CDC), in collaboration and consultation with organizations representing both the public and private sectors of the health community. The purpose of the surveillance is to identify and describe more completely the number and characteristics of pregnancy-related deaths nationally and to use that information to develop and focus prevention strategies to improve maternal health.

The investigative work done in States by maternal mortality review committees is integral to CDC's National Pregnancy Mortality Surveillance.[4] These committees typically operate as a standing committee of the State medical society and are composed of obstetricians, gynecologists, and other health professionals who have a clinical or epidemiologic interest in maternal health.

Historically, maternal mortality review committees began to be established at the local and State level in the 1920s.[5] In the 1950s, the Committee on Maternal and Child Health Care of the American Medical Association (AMA) developed guidelines for state maternal mortality committees.[6] Today many State committees operate under a protocol largely based on the AMA model. In general, these committees:

- Obtain cooperation from State medical societies.
- Develop liaison with State health departments.
- Receive notice of maternal deaths from State offices of vital statistics (accompanied by a copy of the decedent's death certificate).

- Collect relevant information pertaining to each maternal death from the physician in charge of the patient and from medical records and autopsy reports.
- Remove identifiers from records and assign a case number.
- Distribute information to committee members for analysis.
- Disseminate findings.

A 1976 study showed that between 1968 and 1975, the number of States with active maternal mortality review committees declined from 45 to 38, and for those States that had functioning committees, the authors stated that "medicolegal concerns appear to have impeded case investigation or to have limited dissemination of findings in several States."[7] A 1988 study found that the number of States with active maternal mortality review committees had continued to decrease and attributed the decrease to the small number of maternal deaths in the States and to the reluctance of physicians to cooperate because of the current legal climate.[8]

In conjunction with the new National Pregnancy Mortality Surveillance, CDC established a Maternal Mortality Working Group, composed of representatives of State health departments and medical societies who have a broad interest and expertise in maternal health, to provide consultation and guidance. Discussions with working group members revealed both concern and confusion regarding the current status of legal protection for all expert review processes at the State level, including maternal mortality review committees.[9] The concern and confusion center on the statutory protection for committee members against liability and for committee records and proceedings against disclosure in litigation. …

Findings

In the overwhelming majority of States, the legal risk of participating in expert review is negligible. The protections of State law are divided into two categories: confidentiality and immunity. Confidentiality laws protect from disclosure information gathered and created during the review process; some prevent the use of such information in a subsequent lawsuit. Immunity laws insulate participants from personal liability based on actions taken during the review process.

Most States have confidentiality statutes protecting information involved in the review process from disclosure or use in subsequent litigation. Most statutes prevent disclosure of information in "discovery" proceedings; that is, the portion of a lawsuit in which parties may collect information pertinent to their claims or defenses. The most expansive protection not only prevents discovery of relevant documents but also makes such evidence inadmissible at trial. This broader protection would become helpful if a party to a lawsuit obtained a document through inadvertence or some other method outside the discovery process. In such a case, the document would have little value to a litigant because it would not become evidence in a trial. …

Most States also have statutes immunizing participants in the expert review process from civil liability. The most effective statutes protect both the members of the committee and any witness, provider of information, consultant, or employee of the committee. Most statutes will immunize conduct only if that conduct is "without malice," or in other words, only when a person acts on the basis of a reasonable belief that it is the proper thing to do.

Immunity protections are less important than confidentiality for maternal mortality review committees. Because no adverse action, such as restriction of staff privileges or loss of license, is normally taken against a physician as a result of a typical maternal mortality review committee finding, physicians have little risk of being sued personally because they served on such a committee. Nevertheless, immunity protections may be valuable as a guard against lawsuits in the unlikely event that one arises from some other source. …

Discussion

The legal protection provided by State law to maternal mortality review committees depends on the extent to which State law recognizes the difference between maternal mortality review and peer review. Peer review normally takes place at the local level or within an institution such as a hospital. It evaluates medical treatment to assure the quality of the care given. Such an evaluation could be designed to enforce or improve the practices expected of persons with staff privileges to control the costs of medical care. Even when a State medical society or some entity of State government conducts peer review, the purpose of the review focuses on the qualifications of health care providers.

Maternal mortality review, on the other hand, does not consider the qualifications of any physician or the cost-effectiveness of a particular course of treatment. The committee need not (and often does not) know the name of the physician or the patient in the case. The findings of the committee do not result in loss of staff privileges or license or in any other form of discipline. Maternal mortality review takes place at a State level; its only aim is research to identify the most effective forms of treatment or prevention. To distinguish maternal mortality review and other forms of State-level, research-oriented review from peer review, in this report we use the terms "expert review" and "peer review."

Perhaps the greatest legal risk for expert review exists in States that have immunity and confidentiality statutes that are applicable only to peer review. … Expert review committees often find protection under the same statute that applies to peer review. If "peer review" is defined broadly by a statute to include reviews for "improving the quality of health care" or "reducing mortality and morbidity," expert review is probably also protected. On the other hand, if a statute protects peer review only for the purposes of assuring the quality of professional credentials or some other disciplinary purpose, expert review such as a maternal mortality review committee might be left with no special statutory protection. …

Legal structure of the committee. Expert review typically involves some cooperation between the State health department and the State medical society. The health department arranges for a committee of the medical society (or its designated representative) to receive records, such as death certificates and autopsy reports, relating to maternal deaths. Sometimes the medical society acts without any formal or informal authorization from the health department. A few State statutes…provide some protection to committees of local medical societies that is not available to committees of State medical societies. In those States, an affiliation with the local society would provide the most protection.

Some statutes require that the committee be authorized by the health department before immunity and confidentiality will apply to the committee's work. It is important to confirm with legal counsel that the group carrying out expert review has obtained the authorization required by law. Similarly, if the statute requires a particular type of proceeding, such as an

actual meeting of the committee rather than a telephone conversation or correspondence, the statutory requirements should be followed to ensure that the committee does not lose its legal protection.

Summary of confidentiality statutes. The typical confidentiality statute protects certain committee information from discovery in a civil suit. When parties to a lawsuit make a request during discovery for the committee to turn over protected information, the committee may refuse to do so. A smaller number of statutes protect committee information from subpoena, which is an order to appear at a legal proceeding. This protection prevents a party to a lawsuit from forcing another party to bring a document to trial, but it does not prevent the first party from using whatever documents or testimony he or she already possesses.

The strongest statutes go beyond the exemption from discovery or subpoena and provide that committee information is inadmissible as evidence. Thus, if some committee information inadvertently leaks out, it still may not be used as evidence at trial. A few statutes provide simply that committee information is "privileged," which implies an exemption both from discovery and from use as evidence. …

Confidentiality normally applies to all civil proceedings, but in a minority of states the protections apply to some types of lawsuits and not to others. For instance, in some States confidentiality only applies in lawsuits involving the same "subject matter" that was considered by the committee. In other words, if representatives of the patient whose case was being reviewed tried to discover committee documents, they would fail; however, if representatives of some other patient with a similar problem tried to obtain the same documents, they might succeed. Although this provision could limit significantly the protection offered, it will become relevant only in situations where committees hear two cases with enough similarity for the committee's findings in one case to become useful in a lawsuit relating to the second case. Given the small number of cases reviewed by the typical maternal mortality review committee, such similar cases would be unlikely to occur.

Many confidentiality statutes create an exception for information sought by a physician in a lawsuit challenging his or her loss of license or staff privileges. Under these statutes,

the physician may obtain committee information through discovery. However, since physician discipline normally does not result from maternal mortality review, this sort of lawsuit (and possible disclosure) is unlikely to happen.

The committee information protected from discovery or admission as evidence includes both documents and testimony. The documents covered by statute are often described as "records" and "proceeding," which include most of the documents normally involved in maternal mortality review, such as questionnaires filled out by physicians, notes regarding interviews, and memoranda analyzing the information gathered.

Many statutes say that preexisting documents available from independent sources are discoverable even though such documents are presented to the review committee. This stipulation should pose no problem to review committees because the documents involved would be discoverable whether or not the committee used them.

Testimony is also sheltered: parties may refuse to testify about what took place during committee proceedings. Under some statutes, witnesses are forbidden to testify about committee business even if they choose to do so. Some statutes allow testimony relating to matters discussed before the committee if the witness has some "independent" knowledge of those matters. For example, a witness present during treatment may describe to the committee what was seen and could also testify about the same matter in litigation. However, these same statutes always confirm that the witness may not testify about what actually transpired at a committee meeting or about an opinion formed as a result of the committee proceedings.

Even when a statute is silent regarding testimony, such protection might be implied by other language in the law. When a statute protects "proceedings" of the committee from admission into evidence, presumably both documents and testimony revealing what happened in a committee meeting would be excluded from evidence.

The final recommendations or findings of the committee are not always given the same protection as that given the records and proceedings of the committee. However, most States explicitly protect committee findings. Many committees will choose to publish their findings and will therefore be more

concerned with admissibility than discovery. A few statutes require that all patient identifiers be removed from the final report. Even when not required by law, removal of names would be a prudent practice.

Summary of immunity statutes. Immunity always extends to members of the review committee, and it often extends to witnesses and others who provide information. Virtually every statute limits immunity to those cases in which the physician acts "without malice." A person acts without malice under the following circumstances: *(a)* he or she makes a reasonable effort to determine the true facts and *(b)* he or she reasonably believes that the action taken is appropriate.

Personal lawsuits against committee participants normally are brought by physicians who are adversely affected by a peer review decision. Once again, because adverse effects to the physician who handled the case do not normally occur as a consequence of the review by the maternal mortality review committee, the risk of a committee participant being sued personally is low.

Judicial interpretations of statutes. Whenever statutory language is unclear, the courts must interpret the meaning of the statute by trying to determine the intent of the legislature at the time it passed the bill. Therefore, maternal mortality review committees should remain informed about all court decisions in their State that interpret the relevant statute. A regular (perhaps an annual) consultation with legal counsel would offer the best information about such decisions.

For many statutes, no judicial interpretations have appeared yet. Courts that have been asked to interpret statutes have tended not to read the statutes in an unexpected way.

Perceptions of legal risk. The concerns of persons and organizations involved in the maternal mortality review process regarding legal risks generated the impetus for researching the protection afforded by State statutes. In some instances the perceptions of legal risks are accurate. For example, one may correctly perceive low legal risks when in fact there are low risks because statutory protection is strong, or one may correctly perceive higher legal risks when in fact there are higher risks because statutory protection is weaker.

On the other hand, not all of the perceptions of legal risk expressed by those involved in the maternal mortality review process are well-founded. That is, on examination of protective statutes, concerns of some persons about lawsuits may not be warranted. Conversely, complacency about legal risks by others may prove problematic. In any case, a clear understanding of State statutes and discussions with informed legal counsel must be part of an accurate assessment of legal risks.

A survey of legal counsel associated with medical societies and health departments in several States revealed a relatively low level of concern in the legal community about legal risks. Although some were unfamiliar with the maternal mortality review process, legal counsel familiar with both the statutory protections and the review process reported no significant legal difficulties in the past and expressed little or no concern about the adequacy of coverage for future activities of the review committees.

Impact of Federal law. The legal protection for expert review currently derives from State rather than Federal law. Two sources of Federal law—the antitrust laws and the Health Care Quality Improvement Act (HCQIA) of 1986—have a bearing on peer review but not on expert review.

The antitrust laws prohibit conspiracies among competitors to reduce competition. A group of physicians using peer review in bad faith as a way to eliminate competitors (by stripping them of staff privileges or licences) might be liable under the antitrust laws.[14] Antitrust suits are normally filed by a physician whose staff privileges or license is adversely affected by a peer review decision. Because expert review typically does not involve any decision relating to a physician's privileges or license, the antitrust laws do not pose a significant legal threat to the expert review activities covered by this report.

The HCQIA[15] protects all participants in certain peer review activities from any civil damage action, provided they make a reasonable effort to obtain accurate facts and reasonably believe their action will further quality health care. This strong immunity statute will provide uniform legal protection for all States that do not "opt out" of its provisions. However, the HCQIA applies only to peer review activities with the purpose of physician discipline. Because the expert review activities covered by this report (including maternal mortality review)

do not involve physician discipline, the HCQIA will not apply. Conversations with the persons in the Department of Health and Human Services responsible for drafting regulations under this statute confirm this interpretation of the statute.

Implications for other forms of expert review. …State statutes [have] direct relevance to public health policy. Recently, the National Academy of Sciences' Institute of Medicine released a report addressing the future of public health in the United States and delineating Federal and State Government responsibilities for public health. The report concludes that "states are and must be the central force in public health" and recommends that "states review their public health statutes and make revision as necessary" to ensure an adequate statutory base for health activities.[16]

The concept of expert review committees comprised of practicing clinicians, public health officials, medical school faculty, and other health professionals collectively focusing their expertise on a specific health problems is common to almost all States. Maternal mortality review committees are the premier example of such expert review committees. Yet the establishment of expert review committees is not limited to committees to investigate maternal deaths. For years it has been suggested that maternal mortality review committees should extend their activities to include maternal morbidity and perinatal mortality.[5] In fact, "A Guide for Maternal Death Studies,"[17] promulgated more than two decades ago by the AMA Committee on Maternal and Child Care, suggested that a similar guide be developed for organizing and operating an expert review committee to investigate perinatal deaths.[6] Recently, the 1988 report of the National Commission to Prevent Infant Mortality recommended that States "establish expert review panels to investigate each infant death."[18]

Although they have recognized the value of expert review committees, the medical and public health communities are aware that legal safeguards are necessary to protect committee members and the committee proceedings. More than 30 years ago, the AMA "A Guide for Maternal Death Studies" pointed out that laws protecting expert review committees vary from State to State and encouraged committees to seek advice from legal counsel whenever questions and concerns arose.[6] In a recent article stressing the importance of having a review committee investigate maternal deaths, Sachs and coworkers

pointed out that cooperation from clinicians and institutions requires legislation to protect the committee's work from being misused in litigation.[19] Similarly, the Department of Health and Human Services' "Infant Mortality Review Manual," which is a guide for investigating infant deaths, suggests that State statutes be examined to see if they adequately protect the data and opinions of the infant mortality review committee from admission as evidence in court.[20] …

References

1. U.S. Department of Health and Human Services: Promoting health/preventing disease: objectives for the nation. U.S. Government Printing Office, Washington, DC, fall 1980.

2. Ellerbrock, T.V., Atrash, H.K., Hogue, C.J., and Smith, J.C.: Pregnancy mortality surveillance: a new initiative. Contemporary OB/GYN 31: 23-34 (1988).

3. Centers for Disease Control: Progress toward achieving the 1990 objectives for pregnancy and infant health. MMWR 37: 405-413, July 8, 1988.

4. Atrash, H.K., Ellerbrock, T.V., Hogue, C.J.R., and Smith, J.C.: The need for national pregnancy mortality surveillance. Family Plan Perspect 21: 25-26 (1989).

5. Marmol, J.G., Scriggins, A.L., and Vollman, R.F.: History of the maternal mortality study committees in the United States. Obstet Gynecol 34: 123-138 (1969).

6. Committee on Maternal and Child Care of the Council on Medical Services, American Medical Association: Report of officers. JAMA 162: 807 (1956).

7. Grimes, D.A., and Cates, W.: The impact of state maternal mortality study committees on maternal deaths in the United States. Am J Public Health 67: 830-833 (1977).

8. Entman, S.S., Atrash, H.K., Koonin, L.M., and Smith, J.C.: Maternal mortality surveillance (letter to the editor). Am J Public Health 78: 1499-1500 (1988).

9. Owens, A.: Peer review: is testifying worth the hassle? Medical Economics 61: 167-173 (1984).

14. Patrick v. Burget, 108 S.Ct.1658 (1988).

15. 42.U.S.C. Sections 11101, 11111-11152 (West Supp. 1988).

16. Institute of Medicine Committee for the Study of the Future of Public Health: The future of public health. IOM (88-02), Washington, DC, 1988, pp. 143, 146.

17. Committee on Maternal and Child Care of the Council on Medical Services, American Medical Association : A guide for maternal death studies. Chicago, 1964.

18. National Commission to Prevent Infant Mortality: Death before life: the tragedy of infant mortality. Washington, DC, 1988, p. 32.

19. Sachs, B.P., et al.: Hemorrhage, infection, toxemia, and cardiac disease, 1954-85: causes for their declining role in maternal mortality. Am J Public Health 78: 671-675 (1988).

20. Infant mortality review manual. U.S. Department of Health and Human Services, Bureau of Maternal and Child Health and Resources Development, Washington, DC, 1988, p. 4.

Appendix H

Measures of Pregnancy-Related Mortality

Several measures can be used to quantify the various aspects of the risk of death from complications of pregnancy. Measures used to describe the actual risk of death are *pregnancy-related mortality ratio* and *rates*. Each of these measures has the same numerator: the number of pregnancy-related deaths in a year. Using different denominators allows calculation of the chance of dying due to complications of an individual pregnancy (pregnancy-related mortality ratio) and of the chance of a reproductive-aged woman dying of pregnancy complications (pregnancy-mortality rate):

Ratio:

$$\frac{\text{Number of pregnancy-related deaths}}{\text{Number of live births}} \times 100{,}000$$

Rate:

$$\frac{\text{Number of pregnancy related deaths}}{\text{Number of women of reproductive age}} \times 100{,}000$$

Other measures, called *proportionate mortality ratios*, describe the contribution of pregnancy-related deaths to mortality. For these ratios, the deaths in the numerator are a subset—or proportion—of the deaths in the denominator. The proportionate mortality ratio indicates the extent to which pregnancy-related deaths contribute to mortality among women of reproductive age. The cause-specific proportional mortality ratio gives the contribution of different causes of pregnancy-related mortality to the overall pregnancy-related mortality.

Proportionate mortality ratio:

$$\frac{\text{Number of pregnancy-related deaths}}{\text{Number of deaths to women of reproductive age}} \times 100$$

Cause-specific ratio:

$$\frac{\text{Number of pregnancy-related deaths due to specific cause}}{\text{Number of pregnancy-related deaths due to all causes}} \times 100$$

To quantify the risk of death from a specific condition among women who have or develop that complication, cause-specific mortality rates can be calculated. Although this measure uses pregnancy-related deaths from the condition as the numerator, the denominator is the number of women with the condition of interest. These latter data are not always easy to obtain, although population-based hospital discharge may be used to count some conditions.

Case-fatality rate:

$$\frac{\text{Number of pregnancy-related deaths due to given condition}}{\text{Number of pregnant women with the same condition}} \times 100{,}000$$

Appendix I

Example of a Maternal Mortality Review Committee's Report

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Number 1 May 2000

Maternal Mortality and€ Morbidity Review in Massachusetts€

A Bulletin for Health Care Professionals

Pregnancy-Associated Mortality: Medical Causes of Death, 1995-1998

Purpose

The purpose of this bulletin is to present Massachusetts-specific data related to maternal causes of death and maternal mortality ratios from 1995 through 1998, summarize case review findings, and suggest strategies for improving maternal outcomes. This bulletin covers deaths from medical causes associated with pregnancy (see page 2 for definitions). Future bulletins will address other causes of maternal deaths (e.g. drug overdose, homicide and other injuries), and additional epidemiological mortality and morbidity analyses.

Background

A maternal death is a sentinel event. During the last half of this century we have witnessed a dramatic decrease in maternal mortality in Massachusetts. Earlier work[1] documents a decline from 50 per 100,000 live births in the early 1950s to 10 per 100,000 live births in 1985. During those same years, leading causes of maternal death shifted from infection, cardiac disease, pregnancy-induced hypertension and hemorrhage to injury (i.e., suicides, homicides and motor vehicle accidents) and pulmonary emboluS.[2] According to the National Center for Health Statistics, Massachusetts has the second lowest maternal mortality ratio in the U.S (3.3/100,000).[3] These unfortunate deaths teach important lessons to help prevent future mortality. They also provide clues for understanding maternal morbidity and improving women's health in general.

In 1997, the Commissioner of the Massachusetts Department of Public Health (MDPH) appointed a Maternal Mortality and Morbidity Review Committee (MMMRC) to review maternal deaths, study the incidence of pregnancy complications, and make recommendations to improve maternal outcomes and prevent mortality. The work of the committee is protected under M.G.L. c.111, section 24A and 24B, which assures the confidentiality of all records and proceedings.[4] The committee consists of obstetricians, certified nurse midwives, maternal fetal medicine specialists, a neonatologist and a pathologist (see Appendix A). This initiative follows the tradition of improving maternal health through case review begun by the Committee on Maternal Welfare of the Massachusetts Medical Society in 1941. That effort was chaired by Dr. John F. Jewett from 1953 to 1985.[5] Over time, definitions of maternal death have evolved and case finding methods have improved, but the goal of promoting maternal health has remained unchanged.

Defining a Maternal Death

There is no standard definition of maternal mortality with respect to causes of death or timing of death in relation to pregnancy. Varying definitions used at state,[6] national and international levels make comparisons of mortality ratios across states and with national data quite difficult (see Appendix B for definitions). For example, the World Health Organization (WHO) and the National Center for Health Statistics (NCHS) define maternal deaths as occurring either during pregnancy or within 42 days after pregnancy termination. Individual states, however, have adopted various time intervals, from a minimum of 42 days to a maximum of 18 months postpartum. The WHO recently added a second category, called late maternal death, which includes deaths occurring between 42 and 365 days following the end of pregnancy. Deaths caused by accidental or incidental causes or from cancer are excluded under many definitions. The MMMRC purposely chose a broad definition of maternal mortality to permit the most thorough retrospective investigation possible.

Definition of Maternal Death Used in this Study

For the purposes of this investigation, the definition of maternal mortality recommended by the Maternal Mortality Study Group, a national group jointly chaired by the Division of Reproductive Health at the Centers for Diseases Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists (ACOG), was used.[7] In accordance with that definition, the term "**pregnancy-associated"** is used instead of **"maternal"** to reflect the inclusion of deaths occurring during pregnancy.

Pregnancy-associated death: The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause.

Pregnancy-associated deaths are divided into three categories:

1. **Pregnancy-related.** The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by her pregnancy or its management, but not from accidental or incidental causes .[8]

2. **Pregnancy-associated-but-not-pregnancy-related.** The death of a woman while pregnant or within one year of termination of pregnancy due to a cause unrelated to pregnancy.

3. **Undetermined if pregnancy-related.** The death of a woman while pregnant or within one year of termination of pregnancy, but the relationship of her death to pregnancy cannot be determined.

The MMMRC further categorized deaths into those deaths that were caused by a medical condition, and deaths caused by intentional or unintentional injury.

Pregnancy-Related Death:
If this woman had not been pregnant, would she have died?

Mandatory Reporting of Maternal Deaths

Massachusetts hospitals are obligated to report to the MDPH's Division of Health Care Quality the€ death of any woman during pregnancy or within 90 days of delivery or termination, regardless of the€ cause of her death. This regulation applies to deaths that occur in a hospital setting.€

Submit reports by telephone or Fax:€
Telephone: **617-753-8150€**
Fax: **617-753-8165€**

The Massachusetts Department of Public Health requires that "the death of a pregnant woman during any stage of gestation, labor or delivery or the death of a woman within 90 days of delivery or termination of pregnancy will be reported within 48 hours to the department by the hospital in which the death occurs [105 CMR 130.628(C)]." 1989

Methods

Case Finding

Pregnancy-associated deaths occurring in Massachusetts from 1995 through 1998 were identified through mandatory facility reporting to the MDPH Division of Health Care Quality, and manual and automated reviews of death certificates. In addition to these traditional case-finding methods, the MMMRC employed an enhanced surveillance method linking birth certificates and fetal death certificates to death certificates of reproductive-age women. This approach has also been adopted by other states. These enhanced and improved surveillance methods in combination with the ACOG/CDC definition identified more deaths than previously reported.

Case Review

All available hospital medical records related to each woman's pregnancy and death, as well as her death certificate and certificates of infant birth or fetal death were obtained. A primary and secondary reviewer from the MMMRC analyzed all available documents and summarized each case for the entire committee without identifying patients, clinicians, or institutions. In addition, medical specialists in oncology, neurology and infectious disease were asked to review specific cases. During reviews, consensus was sought on answers to several questions:

- Was the death pregnancy-related?
- Was the death preventable?
- What public health and/or clinical strategies might prevent future deaths?

*A **"preventable death"** is broadly defined as a death that may have been averted by one or more changes in the health care system related to clinical care, facility infrastructure, public health infrastructure and/or patient factors.*

Reviews were limited to attainable records, and the following medical records and documents were not reviewed by the committee: ambulatory care records not part of the hospital medical records; full reports of autopsies conducted by state medical examiners; hospital records for births or fetal deaths occurring outside of Massachusetts; and information about deaths or births occurring in non-hospital settings. These records may have provided additional insight.

Mortality Ratios, Causes, and Timing of Death[9]

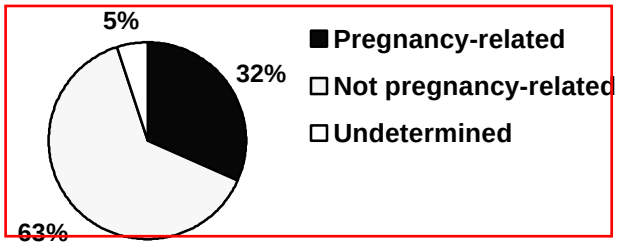
From 1995 through 1998, 88 women were identified (using the enhanced surveillance methods) who met the definition of a pregnancy-associated death. Three additional women were identified and their cases reviewed, but their deaths occurred more than one year following pregnancy and were therefore excluded from this analysis.[10] Of the 88 deaths, 60 (68%) were caused by medical conditions, i.e. were not the result of an injury or drug overdose. The remaining 28 deaths were caused by intentional or unintentional injuries and will be reviewed and reported on in the future.

Pregnancy-Associated Mortality Ratios[11]

Year	Mortality (All Causes)	
	N	Ratio
1995	21	25.4
1996	19	23.4
1997	25	30.8
1998	23	28.0
Total	**88**	**26.9**

Using the enhanced case finding methodology, the pregnancy-associated mortality ratio over the four-year period was 26.9 per 100,000 live births. Among the 60 deaths caused by medical conditions, the pregnancy-related mortality ratio was 5.8/100,000, and the pregnancy associated but not pregnancy-related mortality ratio was1.6/100,000 (data not shown). These ratios cannot be compared to other publications due to differences in definitions and case finding methodology.

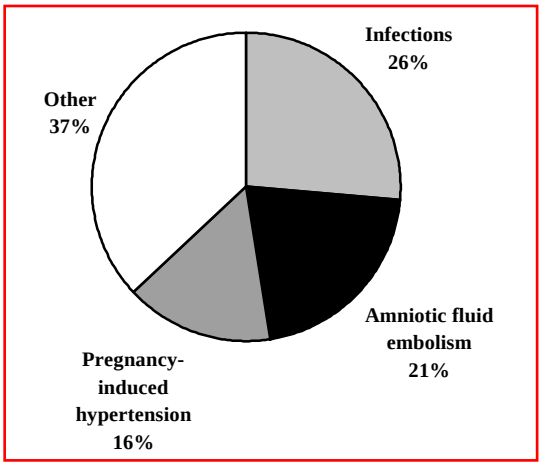
Distribution of Maternal Deaths Caused by Medical Conditions



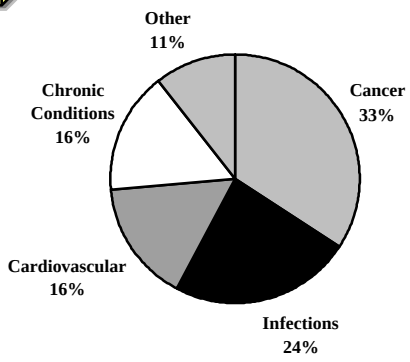
Among the deaths caused by medical conditions, 19 (32%) were pregnancy-related, 38 (63%) were not related to pregnancy, and in 3 (5%) cases it could not be determined whether or not the deaths were related to pregnancy based on available evidence.

Distribution of Pregnancy-Related Medical Causes of Death

The leading medical cause of pregnancy-related death was infectious disease (26%), followed by amniotic fluid embolism (21%) and pregnancy-induced hypertension (16%). Infectious diseases included septicemia, sepsis and varicella. Pregnancy-induced hypertension included HELLP syndrome (Hemolysis, Elevated Liver enzymes, and Low Platelets) and eclampsia. Other causes included cerebrovascular, cardiovascular and chronic conditions, and anesthetic complications.



Pregnancy-associated but not pregnancy-related medical causes of death



The leading cause of pregnancy-associated but not pregnancy-related deaths was cancer (33%) followed by infectious diseases (24%), cardiovascular (16%) and chronic conditions (16%). Cancer deaths included melanoma, lymphoma, leukemia, brain tumors and other rare cancers. Two women had pre-existing diagnoses of cancer before they became pregnant. Infectious diseases included HIV, meningitis, encephalitis, pneumonia, and sepsis. Chronic conditions included asthma, diabetes, lupus and seizure disorders. Other causes included cerebrovascular and iatrogenic conditions.

Timing of Medical Causes of Death

Thirty percent (n=18) of the deaths occurred either during pregnancy or within one week postpartum. Almost all (94.8%) of the pregnancy-related deaths and one-third (34.2%) of the deaths not related to pregnancy occurred within 42 days postpartum, a time coinciding with close contact with obstetrical providers.

Number of Days	All		Related		Not Related		Undetermined	
	N	%	N	%	N	%	N	%
<7 days	18	30.0	14	73.7	3	7.9	1	33.3
7-41 days	15	25.0	4	21.1	10	26.3	1	33.3
42-89 days	7	11.7	0	0.0	7	18.4	0	0.0
90-364 days	20	33.3	1	5.3	18	47.4	1	33.3
Total	**60**	**100.0**	**19**	**100.0**	**38**	**100.0**	**3**	**100.0**

Preventable Deaths€

A **"preventable death'** is broadly defined as a death that may have been averted by one or more€ changes in the health care system related to clinical care, facility infrastructure, public health€ infrastructure and/or patient factors. These determinations were made with the benefit of€ retrospective review and current clinical practice guidelines at the time of the review rather than at€ the time of the death.€

Overall, 30% of the deaths (n=18) may have been preventable. Among the pregnancy-related€ deaths, 42% (n=8) may have been preventable, and among the deaths not related to pregnancy 26%€ may have been preventable (n=10). The preventability of 9 deaths (1 5%) could not be determined€ from the information available at the time of review, and 33 deaths (55%) were probably not€ preventable.€

STRATEGIES TO SAFEGUARD MATERNAL HEALTH

Maternal death case reviews provided meaningful information about when, how and why women died while pregnant or during the first year after the end of their pregnancy. Although infrequent, preventable deaths teach valuable lessons to avert future severe morbidity and deaths. Using composite case scenarios to provide a context for the reader, this section suggests strategies to safeguard maternal health for clinicians, hospital and ambulatory care facilities, as well as the entire public health community. These recommendations are intended to stimulate discussion among all those interested in improving maternal health and pregnancy outcomes and do not represent a comprehensive approach.

Scenarios are composite vignettes drawn from two or more cases with key information changed to protect the identities of patients and providers.

Strategies for Clinicians

Varicella€

Scenario: *A 30y/o woman with no known history of varicella was counseled to avoid exposure during pregnancy. She had an uneventful labor and delivery. In the postpartum period she was exposed and became symptomatic with varicella. Medical records did not indicate if she contacted her provider or was offered VZIG. She became acutely ill, was hospitalized and eventually died of disseminated varicella.*

History of varicella. All pregnant women should be asked about their history of childhood diseases including varicella. History of varicella is an excellent indication of immunity.

Counseling. Pregnant and postpartum women without evidence of varicella infection by history or seropositivity should be counseled to avoid contact with persons with chickenpox or shingles. In addition, these susceptible women should be instructed to call their obstetrical provider soon after any varicella exposure during pregnancy and postpartum periods. Susceptible pregnant women should be counseled to receive their first dose of varicella vaccine in the postpartum period

Varicella Prevention:

- **VZIG for pregnant and postpartum women.** Susceptible pregnant women who are exposed to varicella infection should be given varicella zoster immune globulin (VZIG) within 96 hours of exposure. Given the short time frame for administration of VZIG after exposure, verifying seronegativity may not be possible. VZIG may be given at any time during pregnancy and is free to all MA residents (see Appendix C). Postpartum women have the option of receiving VZIG or varicella vaccine for prophylaxis.

- **VZIG for infants.** Infants whose mothers had an onset of varicella symptoms within five days before delivery and up to 48 hours after delivery, should also receive VZIG.

- **Varicella vaccine.** Susceptible non-pregnant women of childbearing age should be offered varicella vaccine (two doses administered four weeks apart). Pregnancy should be avoided for one month following each dose of vaccine. In lieu of VZIG, varicella vaccine can also be given to susceptible non-pregnant women, including postpartum women, within 72 hours after exposure to varicella infection.

- **Report varicella vaccine use in pregnancy.** If varicella vaccine is inadvertently given within one month of pregnancy, the likelihood of untoward effect is considered to be extremely small. All such cases should be reported to the VARIVAX Pregnancy Registry (see Appendix C).

Influenza€

Scenario: *A 35 ylo woman, G2P1, delivered an infant without complications. Several days after her delivery she developed a flu-like syndrome. Approximately one week later the patient developed adult respiratory distress syndrome secondary to multilobar pneumoccocal pneumonia. Her condition worsened rapidly and she never recovered. Final cause of death was pneumococcal pneumonia superimposed on viral infection. Influenza A infection was confirmed.*

Influenza vaccine. Recent evaluation of published data suggests that an average of 1-2 hospitalizations per 1,000 pregnant women could be prevented in each average influenza season by immunizing pregnant women." The Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) recommends routine influenza immunization of women who will be in the second or third trimester of pregnancy during influenza season. Pregnant women with medical conditions that increase their risk of complications from influenza should be vaccinated regardless of stage of pregnancy. Immunization during pregnancy with the inactivated vaccine is considered safe by many experts, however some providers prefer not to administer the vaccine during the first trimester to avoid association with spontaneous abortion that might occur coincidentally (see Appendix C).

Pneumococcal vaccine. Current American College of Obstetricians and Gynecologists and ACIP/CDC recommendations state that women with high risk conditions for pneumococcal disease (e.g., lung disease, asthma, asplenia) be vaccinated, preferably before pregnancy. If an unvaccinated, high-risk woman becomes pregnant, some authorities in the field advise deferring immunization until after the first trimester (see Appendix C).

HIV Infection€

Scenario: *A 25 ylo pregnant woman with HIV infection presented with dyspnea and a CD4 count of 14 in her last trimester. She was diagnosed with Pneumocystis carinii pneumonia and started on treatment. She went into labor and delivered a viable preterm infant. Her respiratory condition never improved and she eventually died of complications. Although this patient had been receiving HIV care of unknown frequency from an infectious disease specialist, her obstetrical provider was unaware of the HIV status or any HIV-related treatment she was receiving.*

Counseling and testing. After counseling about HIV infection, providers should recommend and offer HIV antibody testing to all pregnant women and all women considering pregnancy.

Treatment. The medical treatment goal for HIV-infected women, pregnant or not, is to maintain optimal health of the woman. All HIV-infected pregnant women who are in care should be offered antiretroviral therapy. Treatment decisions should consider both the pregnant woman's well being and the prevention of vertical transmission to her infant.

Coordination of care between obstetrical and HIV provider. HIV treatment is more successful but far more complex given the variety of pharmacologic regimes available. It is important that a provider with experience in the management of HIV be directly involved in the woman's care. This means that an HIV-infected woman should be receiving care from both an obstetrical provider and an HIV specialist during pregnancy and the postpartum period. Care should be provided in a collaborative manner to maximize the health of the mother and minimize risks to the fetus and baby.

Case Management. Patients with HIV infection who may have difficulty adhering to a treatment regimen or have other complex issues should be referred for case management services.

Septicemia€

Scenario: *A 22 y/o G2P1 in her second trimester developed a fever over 103^{0}F without focal signs or symptoms. Cultures were taken and the patient was sent home. Her condition worsened and she presented at the emergency department where fetal demise was diagnosed. She deteriorated rapidly with onset of septic shock. Her underlying cause of death was determined to be beta-hemolytic Group A streptococcal sepsis.*

Treatment. A woman in the peripartum who shows signs of septicemia should be treated with broad-spectrum antibiotics and screened for disseminated intravascular coagulopathy (DIC). Empiric antibiotic treatment should begin before the final determination of a pathogen. Group A betahemolytic Streptococcus pyogenes is a very rare cause of puerperal infection in the present era, however it can still cause maternal death. Strep. pyogenes can produce an exotoxin that can cause a toxic shock-like syndrome and/or DIC. This pathogen can also present as bacteria with or without symptoms and as an upper respiratory tract infection.

Septic Shock. In cases of fetal demise, prompt diagnosis and treatment of septic shock and DIC are required.

Pregnancy Induced Hypertension (PIH)€

Scenario: *A 36 ylo G1PO was admitted at 34 weeks in early labor with a diagnosis of PIH (B/P144/94, +4 protenuria and +4 reflexes). She was induced and delivered without complications. After delivery the patient's blood pressure continued to be elevated and she complained of epigastric pain and nausea. Her lab values were consistent with HELLP. Treatment included magnesium sulfate and monitoring on a regular postpartum floor. Approximately 40 hours after delivery she had multiple grand mal seizures. Her condition deteriorated and she never recovered. Postmortem findings were consistent with eclampsia with DIC.*

Management. HELLP, including immediate postpartum cases, should be managed aggressively. If the patient's condition worsens she should be transferred to a unit with a high staff to patient ratio. The ACOG Technical Bulletin of Hypertension in Pregnancy reviews methods and techniques of practice for obstetrical providers (see Appendix C).

Chronic Conditions€

Scenario: *A 35 y/o G1PO had a documented history of cardiac arrhythmia which was controlled by medication. When she became pregnant, she discontinued her medication without consulting a cardiologist. Two months postpartum the patient had palpitations, collapsed suddenly and could not be resuscitated by the EMTs.*

Co-management of chronic illness. If a patient gives a history of a chronic or life threatening illness, confirm that she is receiving the appropriate primary and consultant care during pregnancy and postpartum.

Non-adherence to medication regimen. Obstetrical providers should monitor patients' adherence to chronic medication regimes. Appropriate medical consultation should be obtained if a patient has independently discontinued taking a medication for a potentially life threatening condition.

Eating Disorders€

Scenario: *A 34 y/o G4P2 with a past history of bulimia had a pregnancy and birth without complications. Five weeks postpartum she collapsed and was admitted in a coma. She never regained consciousness. Apparently she had been purging daily to reduce her weight.*

Screening and Referral. Women with histories of eating disorders are at risk for an exacerbation of this problem during the prenatal and postpartum periods. All pregnant and postpartum women should be screened for eating disorders and referred as appropriate.

Strategies for Hospital and Ambulatory Care Facilities

Anesthesia and Analgesics€

Scenario: *A 35 y/o G4P2 had a difficult labor and delivered by cesarean section. She received various analgesics through epidural, IV and IM routes during labor and delivery, in the recovery room, and on the postpartum floor. Her care was managed by several providers and through different shifts of nursing staff. No system was in place to track the cumulative amount of narcotics administered.*

Monitoring. The administration of analgesics should be monitored closely for cumulative amount, particularly for women whose care is managed by multiple providers (e.g. anesthesia, obstetrics).

Care of Critically Ill Patients€

Scenario: *A 33 y/o G3P2 with a postpartum wound infection, developed shortness of breath, chest pain and respiratory arrest. She was resuscitated but needed mechanical ventilation. The patient was transferred to an intensive care unit, but needed isolation because of her wound infection. When her respirator malfunctioned, no staff were available to assist her.*

Policies and Procedures

- Existing policies requiring minimum staffing levels for critically ill patients and protocols for monitoring life-support equipment should be followed.
- Emergency equipment and procedures should be reviewed on a regular, established schedule.
- Guidelines should be established for oversight of the care of critically ill obstetrical patients by senior medical staff.
- If the need for more intensive obstetrical and neonatal care is anticipated, the patient should be transferred to a hospital with an appropriate level of care.

Documentation€

Scenario: *A 43 y/o Spanish-speaking G8PO with a history of infertility had a cerclage placed early in pregnancy. At 27 weeks she began bleeding and had signs of infection. She refused removal of the cerclage to preserve her pregnancy and subsequently developed septicemia and died. Medical records did not indicate that an interpreter was provided or that she understood the risks she was taking in refusing treatment.*

When applicable the following information should be recorded in each patient's record:

- Written informed patient consent or non-consent for services or treatment, particularly when patient decisions may negatively effect patient's life and outcome of pregnancy.
- Offer and receipt of social services.
- Explicit chronology during emergencies or during the care of critically ill patients.
- Use of translation and interpreter services.
- Prenatal care record in obstetrical inpatient record after the third trimester.

Strategies for the Public Health Community

Access€

Scenario: *A 38 y/o G3P2 non-English speaking Hispanic woman was enrolled in Healthy Start during her pregnancy. Several months postpartum she developed nausea and vomiting and eventually became non-responsive. When she arrived at the emergency department she was comatose with severe diabetic ketoacidosis and never recovered. Staff had difficulty communicating with family members and could not determine if she had seen a primary care provider since she had given birth*

Translation Services

- Hospital and other health care facilities should provide medical interpreter services for non-English speaking patients.
- According to MDPH regulation 105 CMR:130 615(c), health education materials and activities shall be available in the languages of any non-English speaking group which comprises at least 10% of the population served by the maternal-newborn services.

Transition from Obstetrical to Primary Care:

- All patients, including those patients enrolled in Healthy Start or the uncompensated care pool, should be referred to a primary care provider after obstetrical care is completed.
- Outreach services for the Healthy Start program should expand to the postpartum period to assist women in accessing ongoing primary care.

Preconception care

- Public health professionals and clinicians working with women of child-bearing age should offer information about family planning services, early signs of pregnancy, warning signs of miscarriage and associated sepsis, and the importance of seeking early prenatal care.
- Public health professionals and clinicians working with women of child-bearing age with chronic or life threatening conditions should provide pre-conception counseling about the impact of pregnancy on her health, the impact of her condition on pregnancy, and options available for family planning.

Skin Cancer€

Scenario: *A 25y/o G2P1 delivered a healthy infant without complications. Two months postpartum she was diagnosed with metastatic malignant melanoma. She had neglected to tell her prenatal provider that she had had a bleeding lesion on her scalp for at least 6 months.*

Periodic Screening. All women should be encouraged to have a complete skin exam, including the scalp, by a specially trained health care provider, beginning as early as age 20. In families with a history of melanoma, screening should begin between ages 12 and 14. The American Cancer Society recommends a cancer-related checkup, including skin examination, every three years for people between 20 and 40 years of age, and every year for anyone age 40 and older.

Cardiovascular Disease€

Scenario: *After successfully quitting during her pregnancy, a 42 y/o G3P3 resumed smoking a pack of cigarettes per day after delivery. She had been complaining of "bad indigestion" for a couple of days when she suffered a fatal heart attack at her workplace.*

Screening and Education

- Screen all patients with a history of smoking for relapse or continued smoking postpartum. Counsel and refer for cessation as needed.
- Health education programs in schools and anticipatory guidance in all patient age groups by primary care clinicians should include prevention strategies for cancer and cardiovascular disease.

Conclusions

Maternal death, while rare, is a critical health indicator for women giving birth in the Commonwealth. Improved and expanded case-finding methods used in this study facilitated the identification of more deaths than previously noted and demonstrate the importance of expert case review in conjunction with an active maternal mortality surveillance system. The review of medical causes of maternal death suggests that some of these deaths may have been prevented. Lessons learned from these deaths can enhance the development of a comprehensive strategy to improve women's health at clinical, institutional and community levels.

Notes and References

1. Sachs B, Brown D, Driscoll S, et al. Maternal Mortality in Massachusetts - Trends and Prevention. The New England Journal of Medicine 1987; 316:667-672.
2. Sachs BP, Brown DA, Driscoll SG, et al. Hemorrhage, infection, toxemia, and cardiac disease, 1954-85: causes for their declining role in maternal mortality. Am J Public Health 1988; 78:671-5.
3. NCCDPHP, CDC. State-specific maternal mortality among black and white women - United States, 1987-1996. MMWR 1999; 48:492-496.
4. All appointed members of the committee and assigned DPH staff also signed a confidentiality pledge as a prerequisite to their participation in this effort.
5. Jewett JF. Changing maternal mortality in Massachusetts. The New England Journal of Medicine 1957; 256:395-400.
6. Atrash HK, Lawson HW, Ellerbrock TV, Rowley DL, Koonin LM. Pregnancy-Related Mortality. In: Wilcox LS, Marks JS, eds. From Data to Action: CDC's Public Health Surveillance for Women, Infants, and Children. Washington, DC: U.S. Department of Health and Human Services/CDC, 1995:141-154.
7. Atrash H, Rowley D, Hogue C. Maternal and perinatal mortality. Curr Opin Obstet Gynecol 1992; 4:61-71.
8. This definition differs from ICD-10 which uses the term "pregnancy related" to refer to a death from any cause during or within 42 days of the end of pregnancy (see Appendix B).
9. Massachusetts rates are not comparable to those of other states due to variations in definitions and case finding methodology.
10. Two deaths were caused by postpartum cardiomyopathy and occurred two and a half and seven years postpartum. The third death occurred 365 days post partum from a cause unrelated to pregnancy.
11. Deaths per 100,000 live births that occurred in Massachusetts.
12. "G" is for Gravida or total number of pregnancies, and "P" is for Para or total number of live births.
13. Neuzil K, Reed G, Mitchell E, Griffin M. Influenza-associated morbidity and mortality in young and middle-aged women. JAMA 1999; 281:901-907.
14. Healthy Start is a state sponsored prenatal care program for uninsured low income women not eligible for Medicaid.
15. World Health Organization. Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. 9th Revision, WHO, Geneva, (1977), and World Health Organization. International Classification of Diseases and Related Health Problems, 10th Revision, WHO, Geneva, (1992)

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Appendix B: Other Definitions of Maternal Death

1. **World Health Organization (WHO), International Classification of Diseases, Ninth Revision (ICD-9) and Tenth Revision (ICD-10):**[15]

   Maternal death:
   The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

   Two additional definitions have been added to ICD-10:

   Late maternal death:
   The death of a woman from direct or indirect obstetric causes more than 42 days but less than 1 year after the termination of pregnancy.

   Pregnancy-related death:
   The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of the death.

2. **National Center for Health Statistics (NCHS):**

   Deaths that occur during pregnancy or within 42 days after pregnancy termination, regardless of pregnancy duration and site, from any cause related to or aggravated by the pregnancy, but not from accidental or incidental causes.

3. **Other state maternal mortality review efforts:**

   A number of other states have conducted maternal mortality reviews. Definitions of maternal death vary by time interval from the end of pregnancy until death, and causes of death. All state definitions include deaths that occur during pregnancy. However, the interval of time between the end of pregnancy and death varies from a minimum of 42 days to a maximum of 18 months. Some states, similar to Massachusetts, consider all causes of maternal deaths occurring within a specified time period, while other states restrict their definitions to pregnancy-related deaths only. Deaths from injuries and cancer often are omitted from review because they are considered to be non-pregnancy-related. Variation in definitions, case inclusion and exclusion criteria, and case finding methods, results in mortality ratios that are not comparable across states.

Appendix C: List of Resources

Infectious Disease:

Telephone numbers

- Varicella zoster immune globulin (VZIG): For information about obtaining free VZIG call 617-522-3700
- VARIVAX Pregnancy Registry (1-800-986-8999). All cases of varicella vaccine given while pregnant or within four weeks before pregnancy should be reported to the registry.
- HIV testing number 1-800-750-2016 (consumer)
- HIV information and counseling number 1-800-235-2331 (consumer)

Recommendations

- U.S. Public Health Service Task Force. "Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States". MMWR 1998, Jan 30; 47(RR-2): 1-30. Guidelines updated in 2000 are available in PDF and HTML format at http://www.hivatis.org/trtgdlns.html#Perinatal

- General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1994; 43 (RR-1).

- Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1996; 45 (RR-11).

- Prevention of varicella updated: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999; 48(RR-06).

- Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999; 48(RR-04).

All immunization recommendations are available at http://www2.cdc.gov/mmwr/

Management of PIH:

ACOG Technical Bulletin of Hypertension in Pregnancy, Number 219, January 1996

Translation and Interpreter Services:

A listing of qualified vendors of translation and interpreter services that contract with various state entities may be found on the Commonwealth of Massachusetts website: http://www.comm-PASS.com

Search the site using the following criteria:

Document Type: closed
Purchasing Entity: *Operational Services Division*
Product Category: *Professional Services*
Keyword: *translation*
Select Foreign Language Written Translation & Oral Interpretation Services, Reference No: ST8J51 1; Contractor Contact Listing with Language, Rate and Zone Information.