STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES
Office of the Secretary
One Davis Square, Suite 100, East
Charleston, West Virginia 25301
Telephone: (304) 558-0684 Fax: (304) 558-1130

Earl Ray Tomblin
Governor

Karen L. Bowling
Cabinet Secretary

December 23, 2013

The Honorable Jeffrey V. Kessler, Senate President
West Virginia Senate
Room 227M, Building 1
State Capitol Complex
Charleston, West Virginia 25305

The Honorable Tim Miley, Speaker
West Virginia House of Delegates
Room 228M, Building 1
State Capitol Complex
Charleston, West Virginia 25305

Dear President Kessler and Speaker Miley:

As required by West Virginia Code §61-12A-2, regarding infant and maternal mortality, please find enclosed the report for January through December 2011. This report is provided by the Office of Maternal, Child and Family Health, Infant and Maternal Mortality Review Panel.

If additional information is needed, you may contact Christina Mullins, Director, Office of Maternal, Child and Family Health, via telephone at (304) 356-4392 or e-mail at christina.r.mullins@wv.gov.

Sincerely,

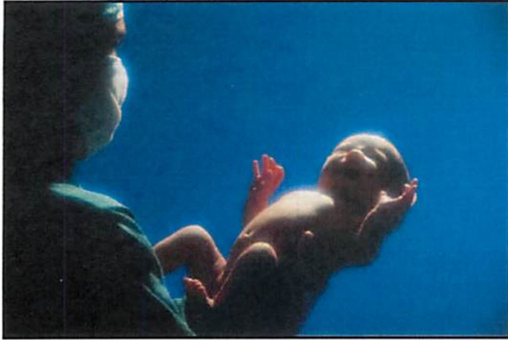
Karen L. Bowling
Cabinet Secretary

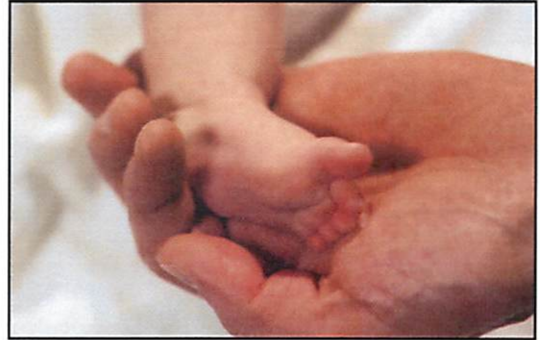
KLB/vc

Enclosure

cc: Letitia E. Tierney, MD, JD
Anne Williams
Christina Mullins
Gregory M. Gray
Joseph Minard
Legislative Library

West Virginia Infant and Maternal Mortality Review Panel





Annual Report 2011

(November 2013)

Bureau for Public Health
Office of Maternal, Child and Family Health
350 Capitol Street, Room 427
Charleston, WV 25301

Earl Ray Tomblin, Governor
Karen L. Bowling, Cabinet Secretary

WEST VIRGINIA INFANT AND MATERNAL MORTALITY REVIEW PANEL

The Infant and Maternal Mortality Review Panel (IMMRP) is multidisciplinary with representatives from medical specialties and public health. Current IMMRP members are:

Melissa Baker, Epidemiologist
Office of Maternal, Child and Family Health

Elizabeth Baldwin, PNP, BC
Designee for West Virginia Nurses Association

Luis A. Bracero, MD, Director
Maternal Fetal Medicine
CAMC Women & Children's Hospital

Stephen Bush, MD, Director
Department of Obstetrics and Gynecology
CAMC Women & Children's Hospital

David G. Chaffin Jr., MD
Associate Professor and Director
Maternal Hypertension Center
Department of Obstetrics and Gynecology
Joan C. Edwards School of Medicine
Marshall University

Kathy Cummons, Director
Division of Research, Evaluation and Planning
Office of Maternal, Child and Family Health

Renee Domanico, MD
University Pediatrics
Marshall University Medical Center

Joseph Evans, MD
University Pediatrics
Joan C. Edwards School of Medicine

Teresa E. Frazer, MD, Deputy State Health Officer
Bureau for Public Health

Doronda Wilson Gaynor, RN
Office of Maternal, Child and Family Health

William Holls, MD, Professor
Director of Labor and Delivery & MFM Outreach
WVU Robert C. Byrd Health Sciences Center

Dr. James A. Kaplan
Deputy Chief Medical Examiner
Office of the Chief Medical Examiner

Dr. Stefan Maxwell, Director
Neonatal Intensive Care Unit
CAMC Women & Children's Hospital

Brenda Mitchell, MD
West Virginia Chapter
American College of Obstetrics and Gynecology

Jane McCallister, Director
Division of Children and Adult Services
Bureau for Children and Families

Trish McCay, Coordinator
Child Fatality/Domestic Violence Review Teams
Office of Chief Medical Examiner

Christina Mullins, Director
Office of Maternal, Child and Family Health

Holli Neiman-Hart, MD, FAAFP
Assistant Professor and Residency Director
WVU Department of Family Medicine

Angelita Nixon, CNM
Designee for West Virginia Chapter of Nurse Midwives

Dr. Lorenzo Pence
VP Academic Affairs/Dean
West Virginia School of Osteopathic Medicine

Joan Phillips, MD
Clinical Director Pediatric Services
CAMC Women & Children's Hospital

Dr. Mark Polak, Chief
Section of Neonatology
WVU Robert C. Byrd Health Sciences Center

Larry A. Rhodes, MD
West Virginia University School of Medicine
Department of Pediatrics

Annette Roberts, RN
Office of Maternal, Child and Family Health

Joseph I. Shapiro, MD, Dean
Joan C. Edwards School of Medicine
Marshall University Medical Center

Robert Shapiro, MD
Assistant Professor, Clinical Director
Obstetrics & Gynecology
WVU Health Science Center

Victoria Shuman, DO FACOFP
West Virginia Society of Osteopathic Medicine

Denise Smith, Director
Division of Perinatal and Women's Health
Office of Maternal, Child and Family Health

Mary Beth Stewart, RN, BSN
Clinical Manager Obstetrics Department
St. Mary's Hospital

Gary Thompson, State Registrar
Vital Registration

Gerry Thompson, RNC, Nurse Manager Labor and Delivery
Cabell Huntington Hospital

Letitia E. Tierney, MD, JD
Commissioner & State Health Officer
Bureau for Public Health

Anne Williams, Deputy Commissioner for Health Improvement
Bureau for Public Health

Legislation
The West Virginia Legislature passed Senate Bill 234 on March 6, 2008. In effect 90 days from passage, a new article, designated §48-25A-1, §48-25A-2 and §48-25A-3, all relating to the creation of a Maternal Mortality Review Team, established its members and responsibilities and gave the Bureau for Public Health rule-making authority for the team.

The passage of West Virginia House Bill 3028 in March 2011 amended the expectations of the Maternal Mortality Review Team by expanding the responsibilities to include infant mortality reviews and renaming the team the Infant and Maternal Mortality Review Team (IMMRT).

During the 2013 Legislative Session, a new law, Senate Bill 108, was passed creating the Fatality and Mortality Review Team; of which the **Infant and Maternal Mortality Review Panel (IMMRP)** is but a part, §61-12A-2(a)(4).

The Legislature found there was a need for a process to study the causes of infant and maternal deaths. It has been found that comprehensive studies indicate these mortalities are more extensive than they initially appear on death certificates. The Legislature believed that more extensive studies would enable development of a plan to reduce these deaths in the future.

The Infant and Maternal Mortality Review process is a method of understanding the diverse factors and issues that contribute to preventable deaths and identifying and implementing interventions to address these problems. The knowledge gained from the reviews will be used to enhance services, influence public health policy and direct planning efforts intended to lower mortality rates.

Responsibilities of the Infant and Maternal Mortality Review Panel
The IMMRP shall: (1) identify infant and maternal death cases; (2) review medical records and other relevant data; (3) determine preventability of deaths; (4) establish trends, patterns and risk factors and develop recommendations for the prevention of infant and maternal deaths; (5) provide statistical analysis regarding the causes of infant and maternal fatalities; (6) disseminate findings and make recommendations to policymakers, health care providers and facilities; and (7) promote public awareness of the incidence and causes of infant and maternal fatalities, including recommendations for their reduction.

The IMMRP shall submit an annual report to the Governor and to the Legislature concerning its activities and the incidence of infant and maternal fatalities within the State. The report is to include statistics setting forth the number of infant and maternal fatalities, identifiable trends in infant and maternal fatalities in the State, including possible causes, if any, and recommendations to reduce the number of preventable infant and maternal fatalities in the State.

Definitions

Maternal Mortality: Death of a woman during pregnancy, at the time of birth or within one year of the birth of a child from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes.

Maternal Mortality Rate: Number of maternal deaths divided by the number of live births (rate reported per 100,000).

Infant Mortality: Death of a live born infant in the first year of life.

Infant Mortality Rate: Number of infant deaths divided by the number of live births (rate reported per 1,000).

Unexpected Death: The death of an infant who has died in the first year of life or a woman who has died during pregnancy, at the time of birth or within one year of the birth of a child, whose immediate death is not anticipated.

Unexplained Death: The cause and manner of death of an infant who has died in the first year of life or a woman who has died during pregnancy, at the time of birth or within one year of the birth of a child, that cannot be determined after an autopsy and thorough investigation of the circumstances surrounding the death.

Review: The process by which all facts and circumstances about a deceased infant who has died in the first year of life or woman who has died during pregnancy, at the time of birth or within one year of the birth of a child are known and discussed among members of a panel.

In 1986, the Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists (ACOG) collaborated to issue a statement recommending the use of two enhanced surveillance definitions as an approach to more accurately identify deaths among women in which pregnancy was a contributing factor.

Pregnancy-Associated Death: (ACOG/CDC) The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause.

Pregnancy-Related Death: (ACOG/CDC) 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.

Pregnancy-related deaths are caused by:

- 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

Case Identification of Maternal Deaths

Maternal deaths are identified from linking death certificates for women aged 10-50 years with birth certificates and fetal death certificates. Additional maternal deaths are identified by ICD 9 diagnostic codes O630–O679 and ICD 10 diagnostic codes O00–O9A – pregnancy, childbirth and the puerperium. All maternal deaths occurring within 365 days of pregnancy conclusion are designated as pregnancy-associated and further investigated.

Cases for review are limited to women of childbearing age who were residents of West Virginia at the time of their death. West Virginia residents who died in other jurisdictions are counted in the official Vital Statistics reports, but they are not included in the case reviews because of the difficulty in obtaining records across jurisdictions.

A Nurse Reviewer reviews death and birth certificates for all pregnancy-associated deaths. Once cases are identified as potentially pregnancy-related, medical records are obtained from all health care facilities providing care before, during and after the pregnancy conclusion. Hospital records at the time of death and autopsy reports are included when applicable. Medical records are de-identified and a summary of events is developed. These documents are sent to all members prior to the meeting.

The IMMRP reviews the potential pregnancy-related cases to determine whether the maternal death was preventable or potentially preventable. Pregnancy-relatedness and opportunities for prevention are determined through Panel discussion.

The IMMRP reviews pregnancy-associated deaths caused from medical complications. The Panel determines whether the maternal death was preventable, not preventable and/or pregnancy-related. Opportunities for prevention are determined through Panel discussion.

Case Identification of Infant Deaths

Infant deaths are identified from linking birth and death certificates for infants in the first year of life. Due to perinatal influences of the mother's health and maternal risk factors, maternal medical information obtained during pregnancy will also be reviewed.

Case reviews are limited to infants who were residents of West Virginia at the time of their death. Infants who died in other jurisdictions are counted in official Vital Statistics reports, but are not included in the case reviews because of the difficulty in obtaining records across jurisdictions. Infants who were residents of other states but died in West Virginia are not reviewed.

Please note this report only includes maternal deaths for 2011. Infant deaths for 2011 are still under review and will be included in the next report.

2011 Maternal Deaths
In 2011, there were 12 pregnancy-associated maternal deaths. One (1) death with medically-related cause, classified as pregnancy-related, was chosen for review by the IMMRP.

The estimated maternal mortality rate for West Virginia in 2011 was 57 per 100,000. (calculated as 12 maternal deaths by 20,955 residence births - tentative 2011 Vital Statistics data).

Maternal Age
One (1) of the 12 mothers was 18 years old. Seven (7) mothers were in their 20's and 4 mothers were age 30-36.

Education
The majority (9) of the 12 mothers had a 12th grade education or greater. Three (3) mothers had less than a high-school education.

Prenatal Care
Prenatal visit information found on the birth and fetal death certificates, as well as the medical records, was used to determine entry into prenatal care.

Four (4) mothers (33%) began prenatal care in the first trimester. Six (6) mothers (50%) began prenatal care during the second or third trimester. Of the remaining 2 mothers, 1 (8%) had no prenatal care and 1 (8%) had unknown prenatal care.

Cause
Drug abuse was the cause for 8 of the maternal deaths in 2011. Two (2) deaths were related to motor vehicle/ATV accidents and 1 death was homicide by gunshot. The remaining pregnancy-related death was a brain stem hemorrhage due to arteriovenous malformation (AVM) in brain. Ten (10) of the 12 cases indicated these mothers exhibited risky behaviors, particularly drug abuse, that contributed to their deaths.

Timing
The majority (11) of all maternal deaths in 2011 occurred after 60 days postpartum. One (1) death occurred within 15 days postpartum.

Medical Coverage
Medicaid was the primary medical provider in all of the 12 cases.

Maternal Deaths 2007- 2011

Maternal Death Case Findings 2007-2011				
Year	All deaths	Deaths related to medical conditions	Pregnancy-related deaths	Resident Births
2007	13	5*	2	22,017
2008	10	5**	2	21,493
2009	6	2	1	21,275
2010	11	8	4	20,471
2011	12	1	1	20,955***
Total	52	21	10	106,211

*1 additional death received out-of-state care, medical records unavailable.
**1 additional death occurred out-of-state, medical records unavailable.
*** Tentative data

2007 - 2011 Maternal Deaths

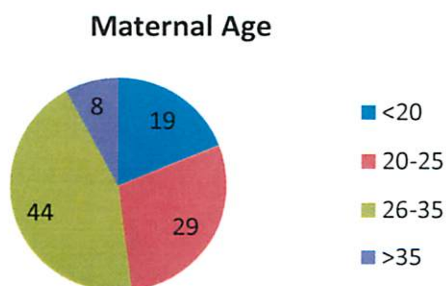
During 2007-2011 there were 52 pregnancy-associated maternal deaths. The estimated maternal mortality rate for this time period was 49 per 100,000. (calculated as 52 maternal deaths by 106,211 residence births - tentative 2011 Vital Statistics data).

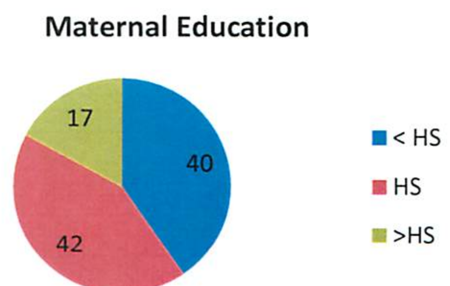
Maternal Age

Ten (19%) of the 52 deaths were less than 20 years old, 15 deaths (29%) were 20 to 25 years of age, 23 deaths (44%) were 26-35 years of age and 4 deaths (8%) were greater than 35 years old.

Education

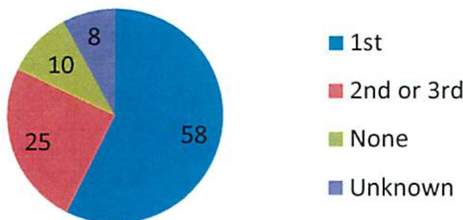
The majority (82%) of the 52 deaths had a 12th grade education or less. Nine (9) deaths (17%) had some college or a college degree.





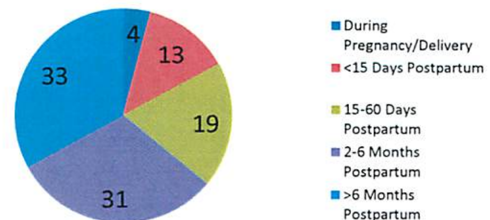
Prenatal Care

Thirty (30) of the deaths (58%) began prenatal care in the first trimester. Thirteen (13) deaths (25%) began prenatal care during the second or third trimester. Of the remaining 9 deaths, 5 (10%) had no prenatal care and 4 (8%) had unknown prenatal care.



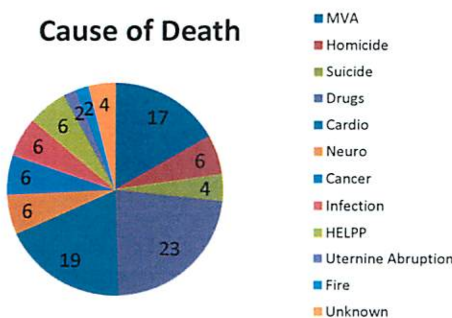
Timing

Two (2) deaths (4%) occurred during pregnancy or delivery. Seven (7) deaths (13%) occurred within 15 days postpartum. Ten (10) deaths (19%) occurred 15-60 days postpartum. Nearly two-thirds of the deaths (64%) occurred after 60 days postpartum.



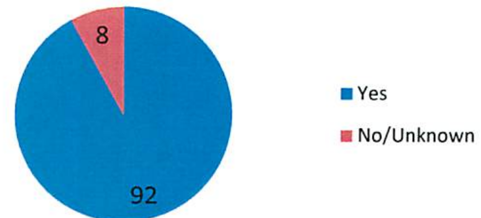
Cause

Nine (9) deaths (17%) were motor vehicle accidents. Three (3) deaths (6%) were homicides and 2 deaths (4%) were suicides. Drug abuse was the cause for 12 (23%) of the 52 deaths. The remaining 26 deaths (50%) were determined as: 10 cardiovascular; 3 neurological; 3 cancer; 3 infection; 3 HELPP; 1 uterine abruption; 1 fire death; and 2 unknown/undetermined.



Medical Coverage

Medicaid was the primary medical coverage in 48 of the 52 deaths (92%) while only 4 deaths (8%) did not list Medicaid as the primary medical coverage.



Recommendations to Date

During review of the 2007-2011 cases, medical personnel, especially emergency room (ER) medical personnel, were not recognizing possible causes and were not always performing correct diagnostic procedures to rule out conditions that may or may not be related to the pregnancy when women are presenting with symptoms of:

a. Nausea, vomiting and other vague abdominal symptoms.
b. Hypertension, whether chronic or pregnancy-induced.
c. Post-partum symptoms that may be related to cardiomyopathy.

Women were misdiagnosed resulting in complications that caused or contributed to their deaths. These problems were addressed through creation of subcommittees for development of educational materials for medical professionals and patients. The IMMRP developed practitioner educational posters for Hypertension/Preeclampsia and Peripartum Cardiomyopathy. These posters were distributed to all West Virginia hospital ERs, rural/community clinics and medical school curriculum across West Virginia. Once the educational materials are in place, the use of available teaching moments such as Grand Rounds, Medical Journal articles, etc. to ensure the ER protocols are being practiced. The Panel recommended that the woman's prenatal care medical practitioner should be notified immediately after she arrives to the health care facility.