



MATERNAL MORTALITY
in
PHILADELPHIA

2010-2012

A report that describes and discusses maternal deaths, 2010-2012,
that were reviewed by the Philadelphia Maternal Mortality Review team

May 2015

ACKNOWLEDGMENTS AND DEDICATION

Special thanks to all of our Philadelphia Maternal Mortality Review team members, both current and former. Your limitless enthusiasm at team meetings has made an otherwise sad undertaking into a thoroughly inspiring endeavor full of hope and promise.

This report is dedicated to all women of childbearing age, including those who reside in Philadelphia, the surrounding region, and beyond.



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TABLE OF CONTENTS

ACKNOWLEDGEMENTS AND DEDICATIONS	ii
PHILADELPHIA MATERNAL MORTALITY REVIEW MEMBERS, 2010-2015	iii
EXECUTIVE SUMMARY	1
INTRODUCTION AND BACKGROUND	3
HISTORY OF THE MATERNAL MORTALITY REVIEW IN PHILADELPHIA	3
MATERNAL MORTALITY REVIEW IN PHILADELPHIA TODAY	4
NATIONAL PARTNERSHIPS BETWEEN THE CDC AND AMCHP	5
DATA: MATERNAL MORTALITY IN PHILADELPHIA, 2010-2012	6
ALL DEATHS	6
PREGNANCY-RELATED DEATHS	9
IMPLICATIONS OF THE 2010-2012 MATERNAL MORTALITY REVIEW	14
RECOMMENDATIONS	15
HEALTH INFORMATION EXCHANGE	15
MATERNAL MORBIDITY AND MORTALITY SURVEILLANCE	16
PREGNANCY INTENTION AND FAMILY PLANNING	17
BEHAVIORAL HEALTH	18
INTIMATE PARTNER VIOLENCE	19
HOSPITAL AND CLINIC-BASED CARE COORDINATION AND SUPPORT SERVICES	20
HOME-BASED CARE COORDINATION AND SUPPORT SERVICES	21
EMERGENCY SERVICES	22
CITATIONS AND ADDITIONAL DOCUMENTS	23

EXECUTIVE SUMMARY: *Maternal Mortality in Philadelphia, 2010-2012*

The rate of pregnancy-related mortality in the United States has more than doubled in recent decades from 7.2 maternal deaths per 100,000 live births in 1987 to 17.8/100,000 in 2009¹ – which is several times higher than the federal government’s current goal. In Philadelphia, measures of pregnancy-related mortality have also more than doubled from the 1980s to the 2000s. Nationwide, black women are at least three times more likely to die from pregnancy-related complications than white women due to a constellation of factors. For every woman who dies of a pregnancy-related cause, there are 50-100 more women who survive with complications (maternal morbidity) that affect their health, families and communities in terms of significant economic, social and personal costs.

According to public health experts, less than half of the rise in maternal mortality is attributable to improved data collection and reporting², yet a considerable underreporting of maternal deaths still exists due to the lack of comprehensive surveillance programs throughout the country. Maternal mortality surveillance programs play a critical role in ensuring that pregnancy-related deaths are identified and reviewed, and in catalyzing maternal mortality prevention initiatives among community stakeholders.

In 2012, the Centers for Disease Control and Prevention (CDC), in collaboration with the Association of Maternal and Child Health Programs (AMCHP), identified 22 active state and local maternal mortality surveillance programs in the U.S. and surveyed them on a variety of issues. The CDC and AMCHP concluded from their assessment that maternal mortality review programs receive poor legislative support and endure multiple threats to sustainability requiring significant dependence on in-kind resources.

Since its inception in 2010, the Philadelphia Maternal Mortality Review (MMR) team has identified and reviewed all Philadelphia residents who have died within one year of the end of a pregnancy, regardless if that pregnancy resulted in a live birth, miscarriage or fetal demise. Over the three-year period covered by this report (2010 to 2012), there were approximately 69,000 live births to Philadelphia residents and 55 women who died within one year of the end of a pregnancy. Of the 55 deaths reviewed by the MMR team, 31 (56%) were Black, Non-Hispanic women, seventeen (31%) were White, Non-Hispanic women, six (11%) were Hispanic women (of any race), and one (2%) was Asian, Non-Hispanic. In terms of manner and cause of these 55 deaths, fifteen were due to accidents (such as drug intoxication, motor vehicle crash, or fire), six due to homicide, two due to suicide, and one due to undetermined manner. The other 31 deaths were due to natural causes (i.e. diseases or medical conditions), with hypertensive disorders, strokes, and cardiac/cardiovascular conditions accounting for twelve deaths.

When looking more closely at the 31 natural (or medical) deaths, nineteen of them were determined by the MMR team to be related to the pregnancy, childbirth or its management, giving Philadelphia a pregnancy-related mortality rate of 27.4 per 100,000 live births over the three-year period of review. Fourteen (74%) of these nineteen pregnancy-related deaths were among Black, Non-Hispanic women.

After closely examining preventability, the MMR team determined that for only one of these nineteen pregnancy-related deaths was there a good chance that the healthcare providers/hospital could have altered the outcome and perhaps prevented the death.

The Philadelphia MMR team used not only the data findings from the 55 reviewed deaths but also the extensive deliberations surrounding the identified shortfalls or gaps in our health systems, social service systems, and community resources to inform the development of the following recommendations:

1. HEALTH INFORMATION EXCHANGE

- Implement a comprehensive Health Information Exchange (H.I.E.) system in Philadelphia as soon as possible
- Make prenatal lab results fully accessible to providers until a comprehensive H.I.E. system is in place

2. MATERNAL MORBIDITY AND MORTALITY SURVEILLANCE

- Establish a state-wide Maternal Mortality Review (MMR) process in Pennsylvania
- Establish a directive to sustain the Philadelphia MMR team
- Make severe maternal morbidity a reportable event in Pennsylvania
- Improve autopsy rates and the quality of death certificate completion at local hospitals

3. PREGNANCY INTENTION AND FAMILY PLANNING

- Remove financial barriers to inserting long-acting reversible contraception (LARC) for the immediate post-partum period or other inpatient hospital stays
- Improve general access to LARC in outpatient settings
- Remove barriers to voluntary post-partum tubal ligations

4. BEHAVIORAL HEALTH

- Convene a series of stakeholder meetings to improve coordination of care between prenatal and behavioral health services
- Develop a city-wide protocol for pregnant and postpartum women on opiate-replacement therapy
- Include postpartum depression scores in newborn discharge summaries

5. INTIMATE PARTNER VIOLENCE

- Support efforts of a coordinated Philadelphia response to the screening, management, and prevention of intimate partner violence (IPV)
- Offer pregnant and postpartum women both in-person and computer-based options for IPV screening

6. HOSPITAL & CLINIC-BASED CARE COORDINATION AND SUPPORT SERVICES

- Increase the number of social work and care coordination staff within hospital/prenatal clinic settings
- Encourage better communication and referral systems between hospitals and home visiting/community support programs
- Increase the use and integration of community health workers in prenatal and postpartum care

7. HOME-BASED CARE COORDINATION AND SUPPORT SERVICES

- Create a coalition or council among home-based service programs in Philadelphia
- Develop a unified referral system for home-based prenatal services
- Create standardized trainings on high-risk prenatal/postpartum scenarios for nurse home visitors
- Provide more prenatal and postpartum services for women without health insurance

8. EMERGENCY SERVICES

- Improve assessment and management of pregnant/postpartum women by first responders and emergency department staff
- Make rapid HIV tests (and their results) available 24/7 in emergency rooms
- Distribute 10-year smoke alarms with new baby discharge packages or at post-partum visits

The Philadelphia MMR team hopes that the implementation of these recommendations by institutions, agencies and organizations across the city will help prevent future maternal deaths, decrease severe maternal morbidity and improve the health and well-being of all area women of childbearing ages.

INTRODUCTION

Maternal mortality is a rare event in the United States and is typically described as the number of pregnancy-related deaths per 100,000 live births. The Centers for Disease Control and Prevention (CDC) monitors maternal mortality on a national scale; its Pregnancy Mortality Surveillance System records the number of pregnancy-related deaths, while its National Center for Health Statistics tracks the number of live births.

Every year, the CDC asks all 50 states to submit copies of death certificates for all women who died during pregnancy or within one year of the end of a pregnancy, as well as copies of matching birth or fetal death certificates. Pennsylvania and nearly every other state currently employ a pregnancy 'check-box' on the death certificate that helps identify if a woman was pregnant within 365 days of her death. Epidemiologists analyze the data collected from the states, and the causes of deaths are coded using a system developed in 1986 by the CDC and the American College of Obstetrics and Gynecology (ACOG). The data are then periodically released through the CDC's *Morbidity and Mortality Weekly Reports (MMWR)* and web site.

History of Maternal Mortality Review in Philadelphia

The first maternal mortality review in Philadelphia began in the late 1920s when the Philadelphia County Medical Society appointed a Committee on Maternal Welfare to analyze maternal mortality in response to the considerable discrepancy between maternal mortality figures published by the US Bureau of Census compared with those from the Philadelphia Bureau of Vital Statistics (760 vs. 670 deaths per 100,000 live births in 1927). The Committee comprised eighteen people representing thirty area hospitals that provided obstetric services in the City at the time. It eventually investigated all 717 deaths that occurred between 1931 and 1933 by examining medical records and interviewing physicians, midwives, and families to determine whether deaths were obstetrical or non-obstetrical. At that time, one woman died in every 141 births, more than half from a combination of septic abortion (25%), puerperal sepsis (19%), and hemorrhage (10%). Nearly six in ten of the deaths were deemed preventable, with the physician responsible just over half of the time due to an error in judgment or technique and the patient responsible for the rest.

The work of the Committee on Maternal Welfare was published in 1934 and considered to be defining not only for the findings and recommendations but also for the standardized procedure established at that time to investigate each death. It defined the problems underlying the high rate of maternal mortality to be: self-induced and criminal abortions; medical professionals' errors of judgment; and a lack of prenatal care. They also cited the failure of the health care field to raise their own standards of obstetrical practice and educate the public about the risks of induced abortion and the need for adequate maternity care. The Committee set forth recommendations, and certain responsibilities were assigned to various stakeholders involved in the provision of maternity care. One such organization—the Obstetric Society of Philadelphia—was charged with conducting an annual review of maternal morbidity and mortality at each hospital and establishing an educational program for the medical profession and lay public. The Committee recommended continuation of “a voluntary survey of hospital puerperal deaths” which was then supported by a grant from the County Medical Society. An ongoing Committee was established with representation from each of the hospitals providing obstetrical services and followed the same standardized case review process. This established the first formal maternal mortality review program in Philadelphia, which prevailed for forty years before going on hiatus for nearly another forty years due to a variety of political and funding issues.

Maternal Mortality Review in Philadelphia Today

In 2006, the Philadelphia Department of Public Health (PDPH) noted from vital statistics data that there was a sudden and sharp increase in the number of identified pregnancy-related deaths in Philadelphia in the years 2002 and 2003. The PDPH decided to examine the circumstances surrounding these deaths and consulted with the Philadelphia Interdisciplinary Mortality Review (PIMR) unit, a group based within the Division of Maternal Child and Family Health (MCFH) that was responsible for conducting child death reviews. By 2007, MCFH decided to re-establish a Maternal Mortality Review (MMR) team in Philadelphia, held three planning meetings, and eventually started to review pregnancy-related deaths. Unfortunately, the new MMR team stopped meeting by mid-2008.

In December 2008, the PIMR unit moved from MCFH to the Medical Examiner's Office (MEO) and underwent a change in name to the Fatality Review Program (FRP). In early 2009, the FRP created a Homeless Death Review team and by late 2010 re-established a Philadelphia-based MMR team. This new Philadelphia MMR team was modeled on the New Jersey MMR team format but adapted to fit the needs of a large, entirely urban county with fewer maternal deaths than a typical state.

The MMR team members review each de-identified case summary to determine issues that demonstrate a shortfall or gap in the systems and/or community resources, which might have had an impact on the woman's health or contributed to her death. The MMR team members use these deliberations to help shape the final recommendations that go into the MMR report.

The general style of the Philadelphia MMR team is similar to the Fetal and Infant Mortality Review (FIMR) methodology in that case records are de-identified and a nurse abstractor summarizes relevant health and social service records for each decedent. An attempt is made to conduct an interview with the decedent's partner/spouse, close family member, or friend in order to fill in gaps of information and to offer bereavement support.

The MMR team is composed of a multi-disciplinary group of thirty members from both governmental and non-governmental agencies representing health care practitioners (obstetrics, midwifery, nursing, maternal fetal medicine, nurse practitioner, psychology, psychiatry, cardiology, critical care medicine, emergency medical services, anesthesiology) and other professionals who interact with pregnant and post-partum women (social work, family planning, maternal child health services, Medicaid managed care, hospital patient safety, homeless services, health care quality, nutrition, women's advocacy, and academia). The MMR team includes important representatives from all six inpatient labor and delivery hospitals in Philadelphia, which has helped to ensure full representation of hospital-based obstetric care across the city.



National Partnerships between the CDC and AMCHP

In 2012, the CDC in collaboration with the Association of Maternal and Child Health Programs (AMCHP), identified 22 active state and local maternal mortality surveillance programs in the U.S. and surveyed them on a variety of topics including: funding/staffing; case identification; data abstraction and review; legislation; program challenges; and the translation of findings into action steps.

The CDC and AMCHP concluded from this assessment that maternal mortality review programs receive poor legislative support and endure multiple threats to sustainability requiring significant dependence on in-kind resources.

From 2012 to 2013, AMCHP in partnership with the National Maternal Health Initiative (NMHI) and the CDC's Maternal Mortality Initiative (MMI) launched several national initiatives seeking to improve maternal health and reduce maternal mortality in the United States:

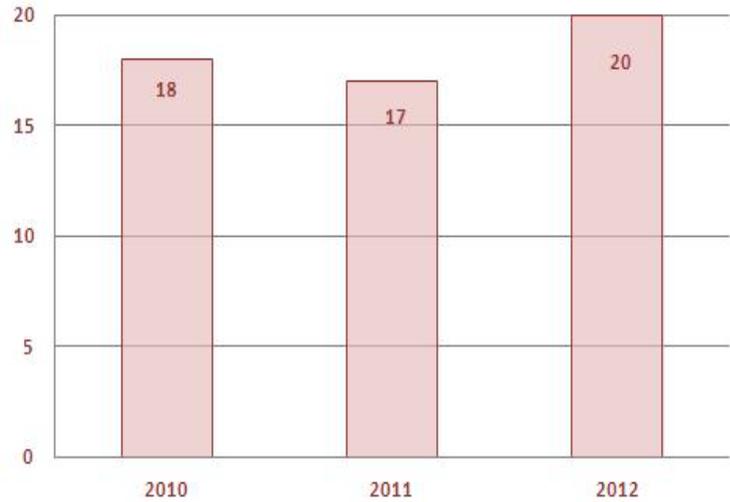
- The NMHI, led by HRSA's Maternal and Child Health Bureau, partners with state and local representatives, consumer and provider education members, and policymakers to reduce maternal morbidity and mortality by improving women's health across the life course and ensuring the high quality and safety of maternity care.
- The MMI, led by the CDC's Division of Reproductive Health, partnered with 15 review teams in 14 states and Philadelphia to conduct an assessment of the capacity for conducting maternal death reviews and provide organizational and technical support. The overall goal of the MMI is to develop recommendations and standards to strengthen existing reviews and guide the development of new maternal death review programs.
- AMCHP's three-year *Every Mother Initiative* project helps states to address maternal health issues in their communities by strengthening and enhancing state maternal mortality surveillance systems. The goal is to use data from the surveillance programs to develop and implement population-based prevention strategies and policy changes to prevent maternal mortality and improve maternal health outcomes.

Maternal Mortality in Philadelphia, 2010-2012

The Philadelphia MMR is composed of two major procedural components: data gathering and case review. After these two components are synthesized, the MMR team puts together a report in which it presents both its findings and recommendations for action.

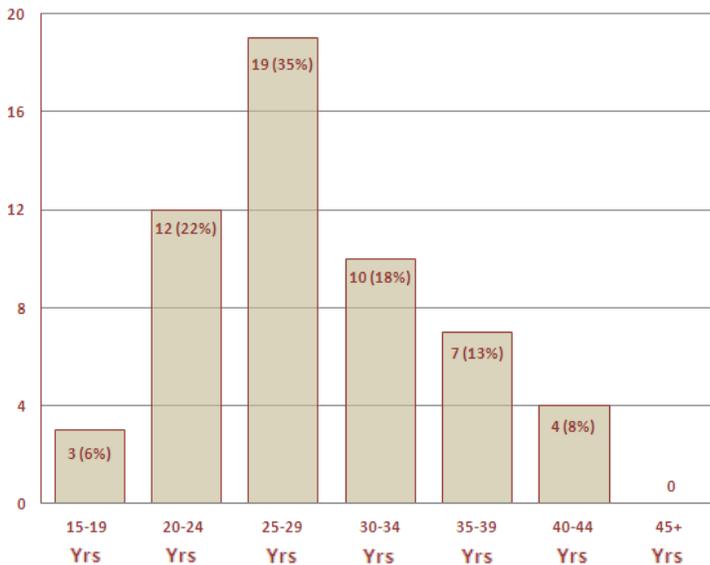
To be eligible for review, women must be residents of Philadelphia at the time of death and must have died within one year of the end of a pregnancy, regardless of the duration of the pregnancy, whether it resulted in a live birth, miscarriage or fetal demise, the cause/manner of death, or the location of death. The Philadelphia MMR team does not limit its review only to pregnancy-related deaths, and so there are multiple cases reviewed where the death is determined to be *not* related to the pregnancy. Reviewed for this report were 55 deaths that occurred from 2010 to 2012 (out of 69,332 recorded live births during the three-year span).

Cases Eligible for MMR Review, 2010-2012

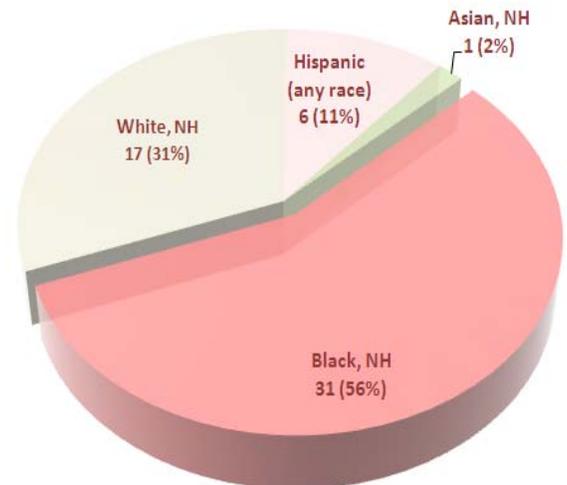


The age categories and the race/ethnicity of the 55 deaths reviewed were as follows:

Age Categories (All Deaths, n=55)

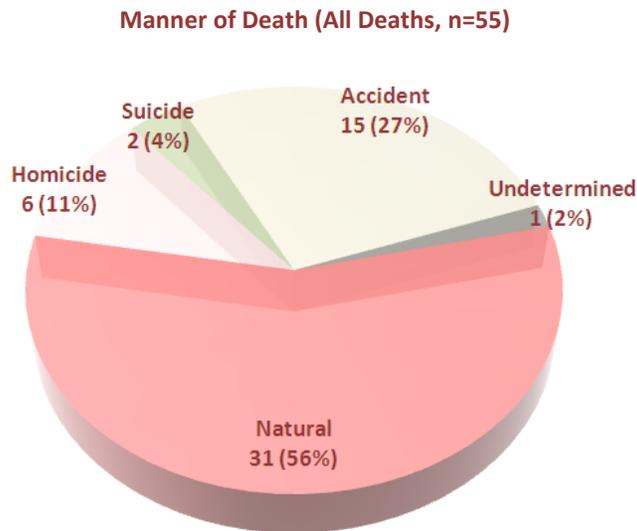


Race/Ethnicity (All Deaths, n=55)

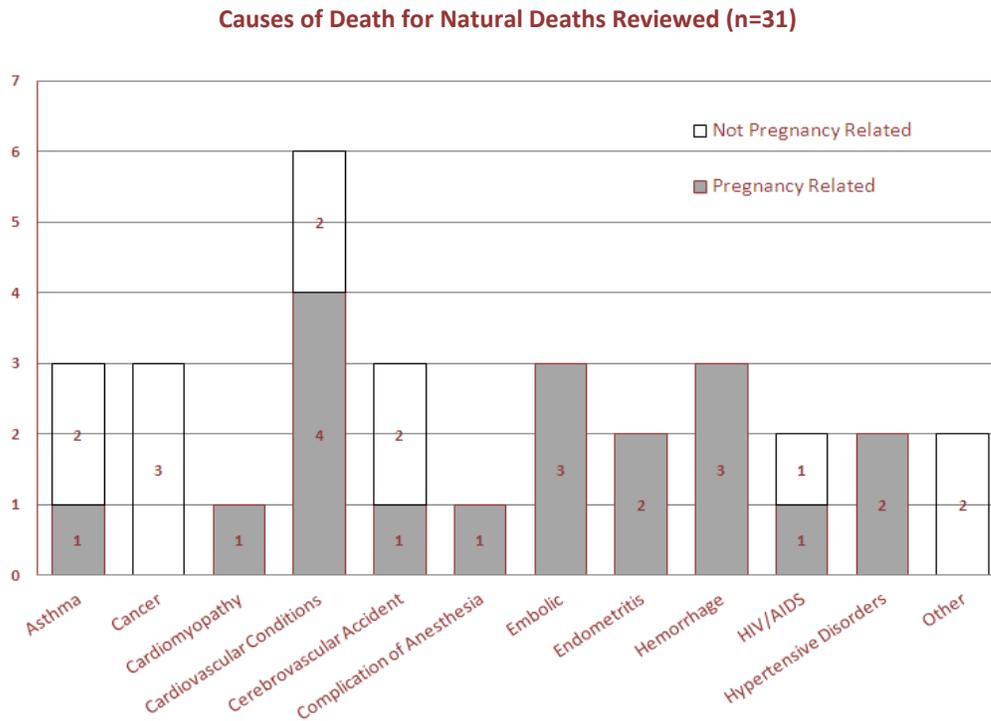


For death certificates in Pennsylvania, a physician must determine the cause and manner of death. The five possible manners of death are accident, homicide, natural, suicide, and undetermined. Among all deaths in Philadelphia, natural deaths are by far the most common manner and listed whenever someone dies from a disease or medical condition (e.g. all infectious disease processes, all cancers, all cardiovascular diseases, etc.).

Of the 55 deaths reviewed by the MMR team and described in this report, 31 were natural deaths, fifteen were accidental deaths, six were homicides, two were suicides, and one was undetermined.

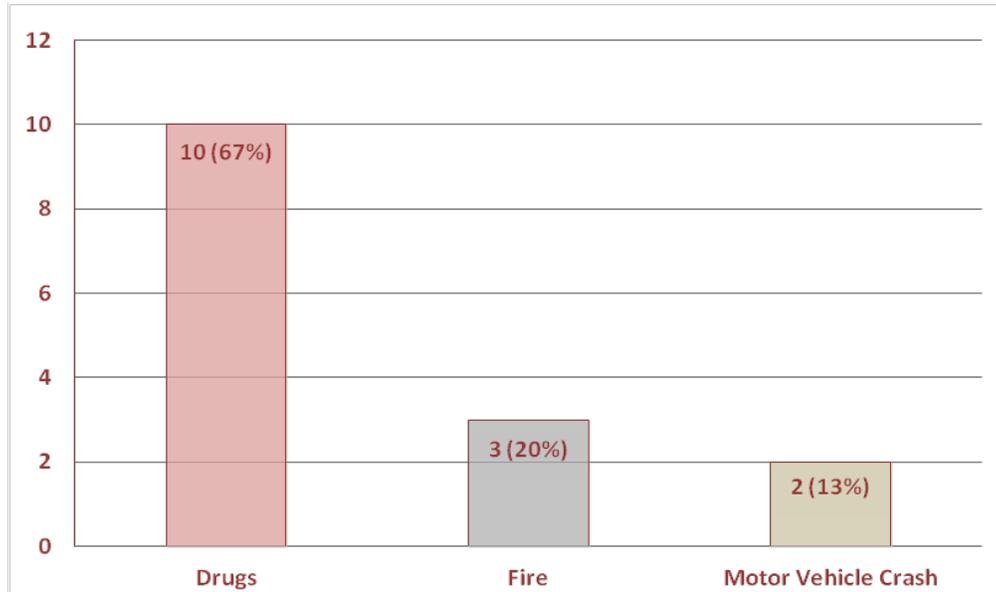


Looking more closely at the natural deaths reviewed, the MMR team grouped them according to standard categories employed by the CDC.



Among the fifteen accidental deaths reviewed by the MMR team, ten were caused by unintentional drug overdoses, three were caused by fire, and two were caused by motor vehicle crashes.

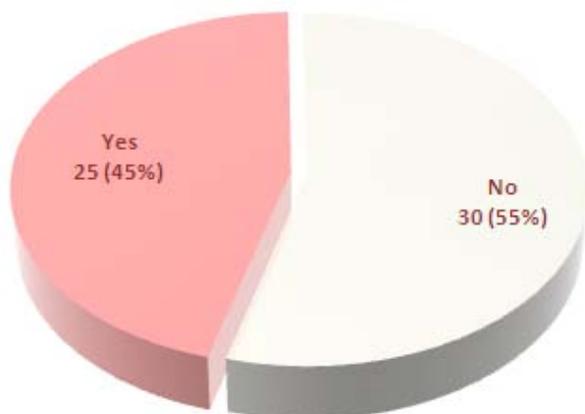
Causes of Accidental Deaths (n=15)



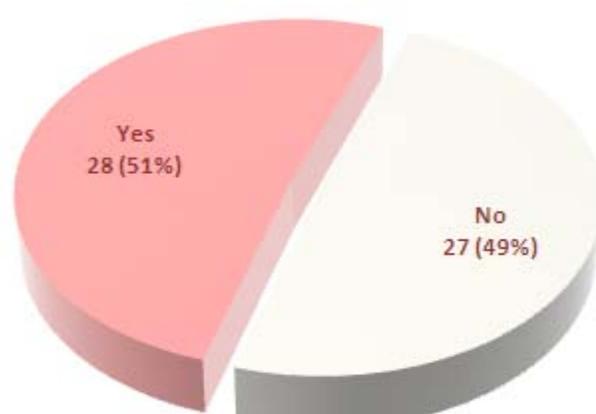
In addition to reviewing the medical health records of all decedents, the MMR team also reviews the decedent’s social history and social service records when available.

Of the 55 deaths reviewed for this report, the MMR team found a fairly high percentage of known behavioral health problems among decedents (such as mental illness and/or drug abuse) that occurred before, during and/or after the pregnancy.

History of Mental Illness (All Deaths, n=55)

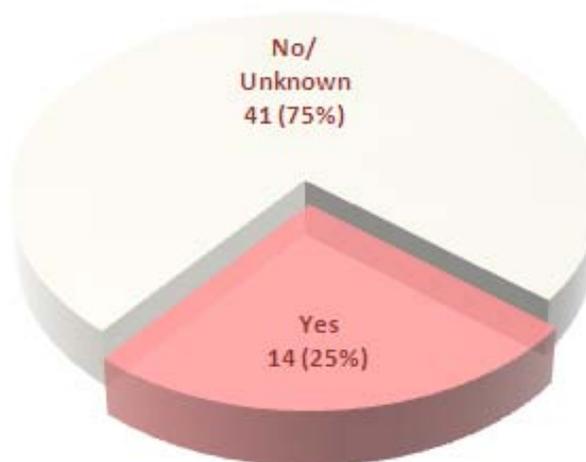


History of Drug Abuse (All Deaths, n=55)



While hospital records contain a social history section, the information is often incomplete or inaccurate. One of the Philadelphia MMR team’s evolving strategies to fill in these missing details is incorporating a family interview into its case review, where a social worker trained in bereavement counseling gathers a social history from someone who knew the decedent very well (e.g. sibling, partner, close friend, parent). Collecting sensitive information on topics such as the history of intimate partner violence (IPV) provides a more complete picture of women’s lives. One-quarter of the women whose deaths were reviewed for this report had a *known* history of IPV at some point in their lives.

Known History of Intimate Partner Violence (All Deaths, n=55)



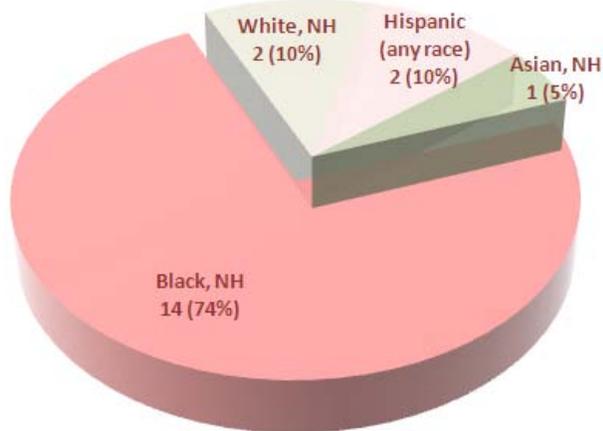
Pregnancy-Related Deaths Reviewed

The Philadelphia MMR team limited the discussion of ‘pregnancy relatedness’ to the natural deaths (i.e. the medical cases), opting not to postulate whether deaths associated with drug use, suicide, or homicide were directly or indirectly linked to the pregnancy. For example, the MMR team felt that for most cases, it would be impossible to determine with any certainty whether a woman accidentally overdosed on drugs because she was overwhelmed with raising a child, whether a woman committed suicide because she was devastated from suffering yet another miscarriage, or whether a woman was killed by her partner because he was upset with her being pregnant.

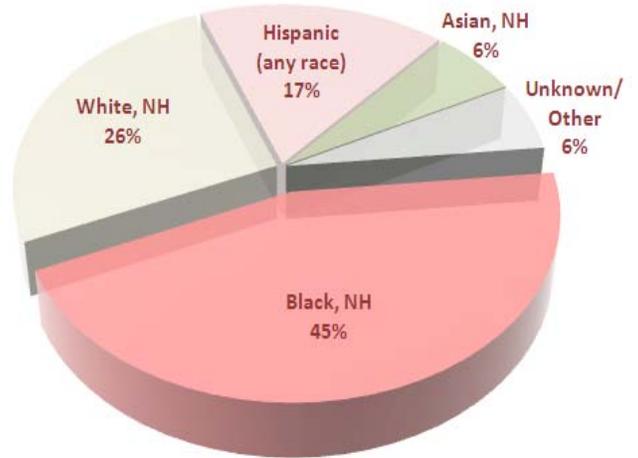
*From 2010 to 2012, 19 of the 31 natural deaths reviewed were determined by the MMR team to be pregnancy-related – due to a direct or indirect result of that pregnancy. Nineteen pregnancy-related deaths among the 69,332 live births during the years 2010 through 2012³ translates into a pregnancy-related mortality of **27.4 deaths per 100,000 live births**. Unfortunately, this number is probably an underestimation of the true count in Philadelphia, as there are likely additional deaths that were not able to be identified by the MMR team and thus never reviewed.*

Looking at race/ethnicity for the nineteen pregnancy-related deaths, we see that Black, Non-Hispanic women comprise an even higher disproportionate percentage of the cases (74%) compared to the overall rate of Black, Non-Hispanic Philadelphians who gave birth in the years 2010-2012.³

Race/Ethnicity of Pregnancy-Related Deaths (n=19)

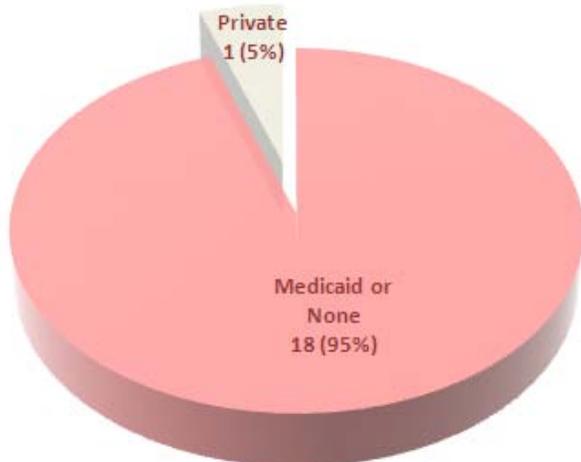


Maternal Race/Ethnicity for all Births, 2010-2012

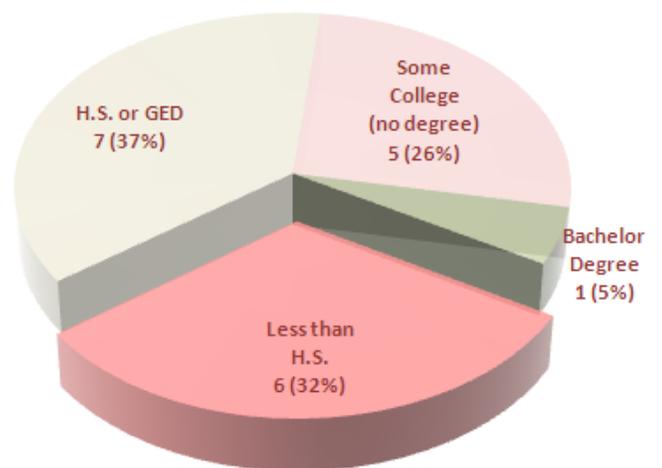


The women who suffered a pregnancy-related death were predominantly of lower socio-economic status.

Insurance Status of Pregnancy-Related Deaths (n=19)

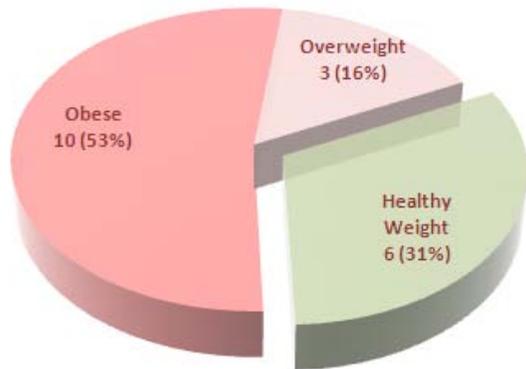


Education Level of Pregnancy-Related Deaths (n=19)

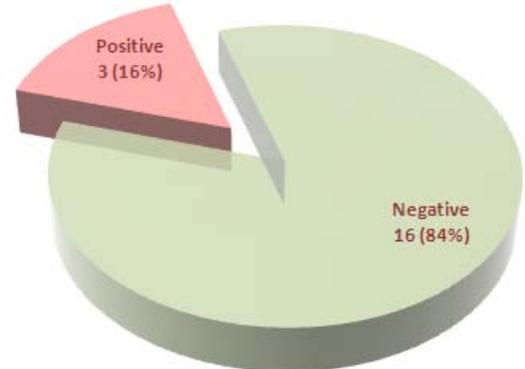


These women tended to be overweight or obese, and a disproportionate percentage of them were known to be HIV positive as compared to Philadelphia women of childbearing age, where the HIV positive rate is under 1%.⁴

Pre-Pregnancy BMI of Pregnancy-Related Deaths (n=19)

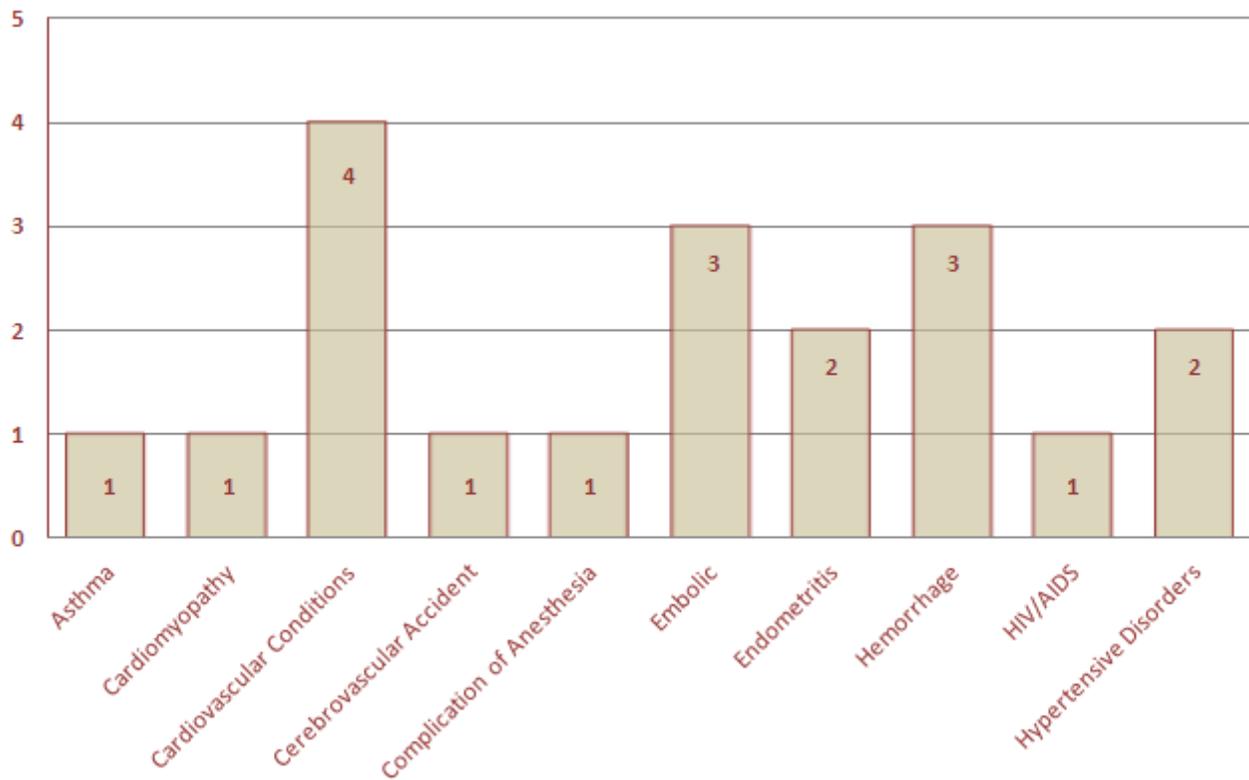


Known HIV Status of Pregnancy-Related Deaths (n=19)



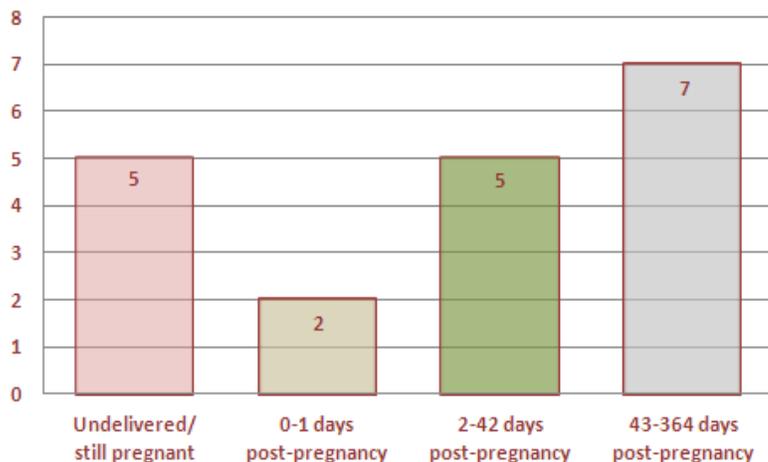
The causes of the pregnancy-related deaths were varied, with cardiovascular conditions, pulmonary emboli, and hemorrhage being the most common categories.

Causes of Pregnancy-Related Deaths Reviewed (n=19)



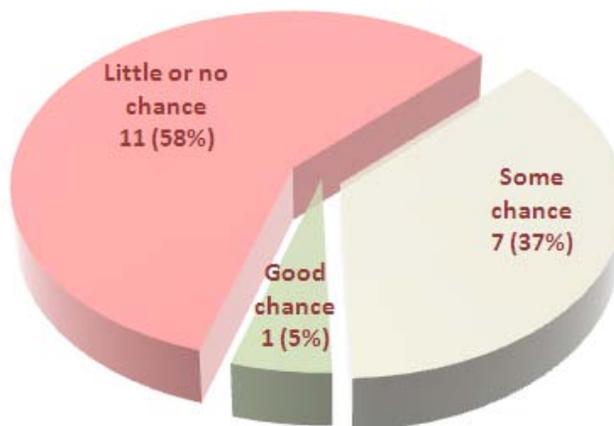
The length of time between when the pregnancy ended (either in a live birth, stillbirth, miscarriage or abortion) and when the woman died is noteworthy. Seven of the nineteen deaths reviewed occurred more than six weeks but less than one year after the end of the pregnancy, which is why most MMR teams will use the extended time frame (up to a year after the end of a pregnancy) to determine whether or not a death was related to the pregnancy. This is something that the World Health Organization (WHO) and many state departments of health do not do when tallying maternal deaths.

Time from End of Pregnancy Until Death, for Pregnancy-Related Deaths (n=19)



Finally, of main concern for many of our healthcare provider members on the MMR team was whether or not the medical or health care systems could have prevented some of these deaths. When Philadelphia first reviewed maternal deaths in the 1930s, the main contributors to death were factors related to the inpatient and outpatient management of pregnancy and childbirth, which the medical profession could directly change. In attempting to quantify this measure, our multidisciplinary advisory board members examined the nineteen pregnancy-related deaths and classified each case as whether there was either “no chance to alter outcome”, “some chance to alter outcome” or “good chance to alter outcome”

"Chance to Alter Outcome" of Pregnancy-Related Deaths (n=19)



The advisory group determined that there was little or no chance to alter the outcome for a majority of the nineteen pregnancy-related deaths.

What about Maternal Morbidity?

Maternal morbidity—the medical complications of pregnancy—includes conditions that are caused or aggravated by pregnancy and adversely affect a woman’s physical and/or psychological health. According to the CDC’s Division of Reproductive Health, the most severe complications (“severe maternal morbidity” or SMM) affect more than 50,000 women in the United States each year.⁵ The CDC defines SMM by using delivery hospitalization data and ICD-9-CM coding. Data on SMM is collected from a hospital inpatient care database, the Nationwide Inpatient Sample, which is one of the databases developed by the Agency for Healthcare Research and Quality as part of the Healthcare Cost and Utilization Project.

The CDC reports in “Severe Maternal Morbidity in the United States,” that the rate of SMM during 2010-2012 was more than twice the rate for 2000-2001 and likely due to a multitude of factors such as obesity, advanced maternal age, chronic medical conditions, and caesarian deliveries. During 2010-2012, for every 10,000 delivery hospitalizations there were 163 cases with at least one SMM indicator (the need for a blood transfusion being the primary indicator), compared with the rate of 79 per 10,000 delivery hospitalizations during 2000-2001.⁵

ACOG’s 2011 Legislative Position Statement, *Improving Pregnancy Outcomes: Maternal Mortality Reviews & Standardized Reporting*, notes: “For every woman who dies of a pregnancy-related cause, many more suffer morbidity related to pregnancy. These morbidities are a significant burden on women, their families and society in economic, social and personal terms.” It further notes that “there is no scientific consensus on uniform definitions of severe maternal morbidity or best practices for data collection, making it difficult both to measure and develop evidence-based interventions. Severe maternal morbidity merits more investigation: the factors that permit some women to survive and others die may be instructive.”

ACOG supports a federal government examination of SMM in order to 1) identify definitions of SMM and 2) make recommendations for research and surveillance. This would include data collection protocols to assist states in identifying and monitoring causes of SMM.

IMPLICATIONS OF THE 2010-2012 MATERNAL MORTALITY REVIEW

Maternal Mortality Review Team Outcomes

In addition to the recommendations emerging from the review of 2010-2012 maternal deaths, several noteworthy outcomes have already extended from the work of the Philadelphia Maternal Mortality Review (MMR) team.

Among the six remaining delivery hospitals in Philadelphia, the following completed actions steps were associated with the MMR team's recent work:

- Post-partum discharge instructions revised and standardized.
- Massive blood transfusion protocols instituted along with enhanced resident education on postpartum hemorrhage risk and treatment.
- Formal guidelines issued for the management of the obstetric client in an ICU setting.
- Guidelines for rapid HIV testing of pregnant women implemented in one delivery hospital.
- Standardized protocol adopted to inform criteria for conducting urine toxicology screens on pregnant women.
- Hospital Grand Rounds programs presented on key topics such as intimate partner violence in pregnancy.

The MMR team's work to date has also catalyzed other collaboration, education and advocacy in the Philadelphia professional community:

- Greater collaboration fostered between Community Behavioral Health and Medicaid Managed Care organizations in the collaborative management of clients' behavioral and physical health issues.
- The EMS transportation policy guiding the transport of pregnant women in non-imminent labor to delivery hospitals was redistributed to first responders.
- The CDC's Dr. William Callaghan provided a comprehensive clinical presentation on maternal mortality and severe morbidity to the Obstetrical Society of Philadelphia's membership.
- Home visiting nursing agencies revised their educational materials for newborn parents.
- Team members testified in support of post-partum LARC reimbursement to Medicaid Managed Care Organizations and Pennsylvania Department of Health staff.
- The Society for Maternal-Fetal Medicine advocated in support of state Maternal Mortality Review surveillance programs.

MATERNAL MORTALITY REVIEW TEAM RECOMMENDATIONS

The overarching goal of the Philadelphia MMR team is to make informed recommendations that will spur initiatives to promote the well-being of women of child-bearing age and prevent maternal deaths. Based on the data findings as well as the extensive deliberations surrounding the systemic shortfalls and resource gaps that were identified in the course of the case reviews, the MMR team presents the following recommendations:

1. Health Information Exchange

The six inpatient labor and delivery units in Philadelphia have separate electronic health record systems that do not interface with each other. This fragments the current health care delivery system in the City. Overcoming this fragmentation requires a health information exchange (HIE) across all hospital and outpatient electronic health record systems. HIE allows medical providers to quickly access patient charts, labs and imaging results from nearby facilities—particularly helpful in urban areas like Philadelphia, where several hospitals are located close to each other and patients are often seen at different hospitals for the same or related complaints.

Lacking timely access to prenatal records can affect clinical decisions and outcomes. Effective transmission and communication of prenatal test results between hospital obstetric care units, emergency rooms, and outpatient centers would provide clinical benefits associated with having reliable data ready when needed, and also decrease unnecessary or repetitive maternal testing and its associated delays and costs.

Currently, HealthShare Exchange (HSX) of Southeast Pennsylvania is at the forefront of establishing the region's first comprehensive HIE, having already enrolled over forty hospitals, three health plans, and two behavioral health facilities into its membership.

A. The Philadelphia Department of Public Health (PDPH) and hospitals, healthcare insurers, and outpatient centers should optimize support for the rapid implementation of the region's first HIE.

- HSX should make sharing of prenatal labs between hospitals and health care systems a high-priority step.

B. Make prenatal lab results accessible to all providers until a city-wide HIE system is fully implemented. Possible examples to achieve this goal include, but are not limited to:

- PDPH could develop a city-wide repository/registry of prenatal labs, similar to Philadelphia's KIDS Plus vaccine registry.
- The Obstetrical Society of Philadelphia, either alone or with partners, could create a Philadelphia version of a health passport or prenatal cards to record essential health information.
- State legislators could introduce a bill that compels Managed Care Organizations to share prenatal lab results with all healthcare providers/systems involved in patients' care.

2. Maternal Morbidity and Mortality Surveillance

Almost half the states across the nation have established Maternal Mortality Review (MMR) processes, which have successfully identified system-based problems, developed and disseminated recommendations, and set priorities toward improving maternal care and preventing pregnancy-related deaths. However, 28 states including Pennsylvania have no such formal process. A lack of formal data collection and review of pregnancy-related deaths in each state conceals the full scope of maternal mortality in our country and is a barrier to developing targeted efforts to address the problem.

Establishing a comprehensive system in Pennsylvania to collect and analyze data on maternal mortality has the potential to increase accountability, develop solutions and reduce pregnancy-related morbidity and mortality statewide.

- A. Introduce state legislation that would enable the establishment of MMR team(s) within all jurisdictions of Pennsylvania. Such legislation should include at a minimum:**
 - Authority for MMR team(s) to request medical records.
 - Legal protection for MMR team(s) from discovery.
 - Funding for MMR team(s) to sustain their operations.
- B. The Pennsylvania Department of Health should establish a state-wide MMR process in Pennsylvania.**
 - The state-wide MMR team should include a surveillance/data collection component.
- C. Philadelphia City Council or the Philadelphia Board of Health should establish a directive to sustain the Philadelphia MMR team.**
- D. Amend Pennsylvania code Title 28, Chapter 27 to include severe maternal morbidity (SMM) as a reportable condition in Pennsylvania.**
 - For reporting purposes on a statewide level, SMM could be simply defined as ICU admission and/or transfusion of four or more units of blood.
- E. Improve autopsy rates and the quality of death certificate completion at local hospitals.**
 - Hospitals should develop a process/protocol for all steps involved when a patient dies.
 - Create trainings for specific residency and fellowship programs (e.g. Internal Medicine, Emergency Medicine, Critical Care) on how to properly fill out a death certificate.
 - Create trainings for residency programs and hospital staff on how to request an autopsy in a *patient-centered* manner.
 - The OB/Gyn department chair should be notified and provide consultation on the death certificate whenever there is a hospital death that is thought to be pregnancy-related.

3. Pregnancy Intention and Family Planning

Half of all pregnancies to women in the United States are unintended, and rates are disproportionately higher among young, low-income, and minority women. Unintended pregnancy carries significant cost to individuals, families, and their communities. Women who continue with unplanned pregnancies are more likely to experience poor health outcomes, including infant and maternal morbidity and mortality.

A common underlying contributing factor to the high rate of unintended pregnancy in a community is a lack of affordable, accessible, and effective family planning services. Implementing policies that remove barriers and increase access to effective contraception is an important step toward reducing high rates of unplanned pregnancy.

A. Remove financial barriers to inserting long-acting reversible contraception (LARC).

- Unbundle compensation for LARC devices from pregnancy reimbursement rates so that hospitals may be reimbursed for the device and its insertion during the immediate postpartum period or other inpatient hospital stays.

The South Carolina Birth Outcomes Initiative made an official recommendation in 2011 that immediate postpartum LARC be covered by Medicaid payment plans. This resulted in a policy change allowing LARC insertion during the delivery hospitalization to be reimbursed outside of the DRG payment. Medicaid managed care organizations followed suit in their individual contracts and in 2013, payment structures were reconfigured to allow for this new policy. This change has increased the uptake of immediate postpartum contraception among low-income women.

B. Improve general access to LARC in outpatient settings. Possible examples to achieve this goal include:

- Hospitals and residency programs should train more providers in LARC insertion.
- Offer LARC insertion at more venues citywide that serve adolescent and adult women, such as pediatric, adolescent medicine, and family medicine practices.

C. Hospitals should help remove local barriers to and prioritize voluntary post-partum tubal ligations as non-elective procedures.

In July 2012, The American College of Obstetrics and Gynecology's (ACOG) Committee on Health Care for Underserved Women issued Committee Opinion (Number 530)—Access to Postpartum Sterilization.⁶ Some of the statements and recommendations that ACOG made in this opinion piece are as follows:

- *Unintended pregnancy is a serious problem in the U.S. that is associated with health risks and costs for a woman, her family and society.*
- *Postpartum sterilization is a highly effective method of contraception, and access to it is an important strategy to reduce high rates of unintended pregnancy.*
- *Given the consequences of a missed procedure and the limited time frame in which it may be performed, postpartum sterilization should be considered an urgent surgical procedure.*
- *Increasing access and availability of postpartum sterilization may not only directly improve outcomes for women desiring the procedure, but may decrease overall costs to the health care system.*
- *There are unfair differences in consent rules surrounding sterilization procedures based on insurance type. Obstetrician–gynecologists should advocate for fair and equitable access for women who are enrolled in Medicaid or other government health insurance programs.*

4. Behavioral Health

Behavioral health problems are common during pregnancy and the postpartum period, and they result in serious health risks. According to ACOG, there is insufficient evidence to support a firm recommendation on how and when to screen pregnant and postpartum women for depression. However, improved screening for behavioral health problems such as depression and substance dependency has the potential to benefit the health of pregnant women and their families.⁷ Such behavioral health screening is particularly important for women who have not had recent contact with the health system, such as when women first engage in prenatal care.

Women who need mental health support require prompt evaluation and treatment, and having a prioritized referral process for pregnant women can facilitate this.

- A. The Department of Behavioral Health and Intellectual disAbility Services (DBH) should investigate what organization or agency would be best situated to convene a series of stakeholder meetings focused on improving the coordination of care between prenatal and behavioral health (BH) services in Philadelphia. Some of the specific topics that could be addressed at these stakeholder meetings include:**
- Create standardized behavioral risk assessments to be used at prenatal intake visits.
 - Support co-location of BH providers at prenatal care clinics.
 - Use care coordinators to bridge communication between prenatal and BH providers.
 - Remove barriers of obtaining information from BH providers (e.g. work with community mental health centers and area BH providers to develop a standardized request form to be used at prenatal visits).
- B. DBH should coordinate the development and dissemination of a city-wide protocol for pregnant and postpartum women on opiate-replacement therapy.**
- C. Hospitals should include postpartum depression scores in newborn discharge summaries.**

5. Intimate Partner Violence

Pregnant women with histories of Intimate Partner Violence (IPV) are less likely than other pregnant women to report having had discussions with a provider about IPV during their prenatal care and are more likely to be late to prenatal care.⁸

Women abused during pregnancy are at greater risk for further violence and for death due to abuse compared to non-pregnant women⁹, and they are more likely to report substance abuse, depression, and other adverse pregnancy outcomes.¹⁰ Women reporting IPV are also at high risk for reproductive coercion and unintended pregnancy.¹¹

A. Government agencies, local hospitals, and community-based organizations should support the efforts of Philadelphia’s coordinated community response to domestic violence. Some of the specific topics that could be addressed at future coordinating council meetings include:

- Create a coordinated response to IPV within and between hospitals – with a focus on obstetric triage services and emergency rooms.
- Increase in-hospital access to IPV counselors, preferably to 24/7 coverage.
- Improve referral systems, education for providers, and sharing of resources.
- Implement provider trainings on best practices in IPV screening, referrals, and counseling.
- Encourage the development and testing of interventions to prevent recurrent IPV episodes during pregnancy.
- Encourage the development of interventions to prevent reproductive coercion.
- Include a de-identified data collection component connected to IPV screening to allow for improved distribution and allocation of resources dedicated toward addressing IPV.

In a multi-site project developed in Washington, DC, a brief psycho-behavioral intervention incorporated into 4-8 prenatal visits and focusing on the negative psycho-behavioral risks of poor health, psychological distress, mental illness, and heightened substance abuse successfully reduced incidence of recurrent episodes of IPV during pregnancy; women with severe IPV showed significantly reduced postpartum episodes as a result of this intervention.

B. Hospital, clinics, and community health centers should offer pregnant women both face-to-face and computer-based options for IPV screening.

In one study, 36% of pregnant patients disclosed IPV either via computer or in person. Of those who disclosed IPV, 34% disclosed IPV via only one of the two methods. While computerized screening was felt to be non-judgmental and more anonymous, in-person screening allowed for tailored questioning and more emotional connection between patient and provider. Offering pregnant women both options may improve the impact of universal IPV screening in prenatal clinics and hospitals.

6. Hospital and Clinic-based Care Coordination and Support Services

There is a general consensus among the members of Philadelphia’s MMR team that a lack of care coordination services to pregnant and postpartum women undermines efforts to reduce maternal mortality and morbidity in our community.

Budget restraints and the reduction of non-medical staff over the years has lead to a drop in the amount of social work/case management staff both in hospitals and in prenatal clinics. To enable better and more collaborative care coordination, the MMR team recommends a number of initiatives:

- A. Hospitals, clinics and community health centers should increase the number of social work and case management staff for pregnant and postpartum women in order to enable more comprehensive follow-up and care coordination – particularly for those women at high risk due to chronic medical health conditions and/or behavioral health issues.**
 - Hospitals and Medicaid Managed Care Organizations should work together to create cooperative fiscal agreements in order to offer collaborative hospital-based prenatal and postpartum care coordination and case management services.

- B. Delivery hospitals should develop better referral and communication systems with home visiting and community-based support programs, in order to facilitate early and comprehensive care and service coordination for their pregnant and postpartum patients.**

- C. Hospitals, clinics, and community health centers should integrate community health workers (CHWs) into traditional care coordination and counseling efforts for pregnant and postpartum women. Possible examples to achieve this goal include:**
 - Health facilities and community-based organizations providing CHW services could develop collaborations to identify pregnant women most at risk for poor health outcomes.

 - Health facilities could train more CHWs who provide support services to pregnant and postpartum women through standardized, accredited training programs that are focused on psychosocial issues, health system navigation, neighborhood resources and health behaviors.

 - Health facilities could integrate CHW notes into health records in order to facilitate better communication with clinical providers.

7. Home-based Care Coordination and Support Services

Many pregnant and postpartum women in Philadelphia do not receive the education, financial support, health and social services to make healthy lifestyle decisions, because they encounter barriers to accessing early and comprehensive peri-partum care.

Fragmentation of prenatal/postpartum services and poor ongoing collaboration between home-visitation programs undermines the ability to reach and serve all women and families in need of support.

To increase women's access to comprehensive, home-based supports services and catalyze coordination and collaboration between organizations providing health and social services to pregnant and postpartum women, the MMR team recommends a number of initiatives:

- A. Leading city-wide maternal and child health organizations and other public health stakeholders should convene with a goal of sharing resources, optimizing cross-referrals, and creating a home-based services coalition or council that can issue policy recommendations. A newly-formed coalition could:**
 - Hold a summit of home-visitation program and ancillary agency leadership.
 - Support the development of a unified referral system for home-based prenatal services.
 - Create training modules to increase nurse home visitors' clinical knowledge on high-risk prenatal and postpartum clinical scenarios.

- B. Maternal, Child, and Family Health (MCFH), hospitals, and community health centers should create or fund new programs that provide more prenatal and postpartum services to women who do not have or cannot qualify for health insurance.**

8. Emergency Services

Over a ten-year span starting in the late 1990's, thirteen inpatient labor and delivery units in Philadelphia closed, leaving behind only six hospitals to serve the maternity needs of a city of over 1.5 million people. This imposes a greater transportation burden on women seeking maternity care.

As a result of these greater distances to travel, many pregnant women without private transportation utilize emergency medical services to get to hospital-based care, even when the medical need is non-emergent.

Therefore, emergency departments and emergency medical services play an increasingly important role in the care of pregnant women in Philadelphia.

A. Improve the assessment and management of pregnant and postpartum women by emergency department staff in Philadelphia.

- The Pennsylvania Medical Society should create trainings for emergency department staff on high-risk prenatal and postpartum clinical scenarios (e.g. peri-mortal caesarian sections).
- Hospitals should create/update protocols for managing pregnant women in their ERs.

B. Philadelphia's Emergency Medical Services (EMS) unit should convene a meeting with local OB/Gyn department chairs and other key stakeholders toward identifying and implementing improved standards for assessing and managing the EMS care of pregnant and postpartum women in Philadelphia. Some of the specific topics that might be addressed at the meeting include:

- Create or update EMS trainings/protocols for first responders working with pregnant women.
- Re-review EMS transport policy of pregnant women (in medical distress or imminent delivery).

C. Hospitals should make rapid HIV tests (and their results) available 24/7 in emergency rooms.

D. The Philadelphia Fire Department should explore a partnership with local hospitals, community-based organizations, and/or private industry (such as health and home insurance providers) to distribute 10-year smoke alarms with new baby discharge packages, whether at home visits or at post-partum visits.

The Philadelphia MMR team believes that the implementation of these recommendations by institutions, agencies and organizations across the city will help prevent future maternal deaths, decrease severe maternal morbidity and improve the health and well-being of all area women of childbearing ages.

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