Department of Health and Mental Hygiene

Legislative Report

on

The Maternal Mortality Review Program

December 1, 2002

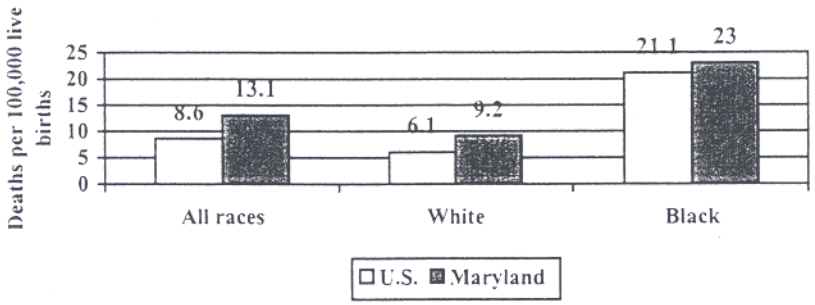
I. Introduction

During the 2000 Maryland General Assembly, House Bill 515 and Senate Bill 459 were enacted to establish maternal mortality review in Maryland. The bills require: (1) identification of maternal death cases; (2) review of medical records and other relevant data; (3) determination of preventability of death; (4) development of recommendations for the prevention of maternal deaths; and (5) dissemination of findings and recommendations to policy makers, health care providers, health care facilities, and the general public. The bills took effect October 1, 2000 and will sunset September 30, 2003.

II. Background

The maternal mortality ratio (MMR), number of maternal deaths per 100,000 live births, in Maryland has shown no improvement in recent years. After falling to its lowest level in the1981–85 five-year period (5.0 maternal deaths per 100,000 live births), the MMR for the most recent 5-year period, 1996-2000, in Maryland has more than doubled to 13.1 maternal deaths per 100,000 live births. The African American MMR is 2.5 times higher than the White MMR. Compared to the U.S., the overall MMR in Maryland is 52% higher than the U.S. ratio of 8.6 for the same 5-year period. The MMR for white women was 51% higher in Maryland than in the

Figure 1. Maternal Mortality Ratio by Race
U.S. and Maryland, 1996-2000



U.S.; rates for black women were 9% higher. (See Figure 1.) All rates are substantially higher than the national Healthy People 2010 initiative goal of 3.3 maternal deaths per 100,000 live births.

For the most recent single reporting year, the MMR in 2000 was 18.9 deaths per 100,000 live births – the highest it has been in Maryland since 1970. (Note: single year reporting can be misleading due to small number of cases per year.) Preliminary reports indicate that Maryland has one of the worst MMRs of any state in the U.S. for 2000.

Although the high MMR in Maryland is a cause for concern, it is also a positive reflection on intense efforts in Maryland since 1999 to increase the identification of maternal deaths. These efforts have uncovered nearly twice the number of maternal deaths than previously reported for the period 1993-1999. This increase is in line

with estimates by the American College of Obstetricians and Gynecologists (ACOG) and the CDC that at least half of all maternal deaths in the United States are not identified. Other states, following in Maryland's footsteps, are now also finding unreported maternal deaths by using enhanced surveillance techniques. It is not clear whether the recent rise in MMR reflects an increase in maternal deaths, or more complete reporting of these deaths, or a combination of the two.

III. Accomplishments in the First Year of Maternal Mortality Review (10/1/00 – 9/30/01)

a) *Enhanced Surveillance of Pregnancy-associated Deaths in Maryland*

Maryland was the first state to complete an extensive identification of pregnancy-associated deaths through use of medical examiner records and live birth/fetal death linkage to supplement information obtained from the death certificate. Analysis of data indicated that the number of deaths was substantially higher and causes of death substantially broader than previously known. Leading causes of death were homicide and cardiovascular disorders.

b) *National Coverage of Maryland Maternal Mortality Study*

The results of Maryland's comprehensive identification of pregnancy-associated deaths were published in the March 21, 2001 issue of the Journal of the American Medical Association (JAMA) in an article entitled "Enhanced Surveillance of Pregnancy-Associated Mortality – Maryland, 1993-98" co-authored by Isabelle Horon, Dr.P.H. (Vital Statistics Administration) and Diana Cheng, M.D. (Center for Maternal and Child Health). Coverage of this study extended to local and national TV, radio, newspaper, magazines and web sites.

c) *Addition of Pregnancy Questions to Death Certificate*

To facilitate identification of maternal deaths, the Maryland death certificate was revised in January 2001 to include questions about current or recent pregnancies. Use of a pregnancy check box by all states beginning in 2003 is being recommended by the National Center for Health Statistics.

d) *Maryland Mortality Report*

In October 2000, the Department of Health and Mental Hygiene (DHMH) issued a report entitled "Maternal Deaths in Maryland 1993-2000". This report showed that maternal deaths are significantly more common in women who are African American, over 35 years of age, unmarried, of

high parity (three or more previous live births), less educated (high school or less), and receive late or no prenatal care.

e) Broadening Focus for Reviews by Maternal Mortality Committee

For the first time, the Maternal and Child Health Committee of MedChi, the Maryland State Medical Society, will conduct case reviews of non-medical causes of death (such as homicide, suicide, substance abuse). Previously, only medical causes of death (hemorrhage, embolism, hypertension) were reviewed.

IV. Accomplishments in the Second Year of Maternal Mortality Review (10/1/01 – 9/30/02)

a) Continued Surveillance of Pregnancy-Associated Deaths in Maryland

The Vital Statistics Administration continues to work with the Center for Maternal and Child Health in the comprehensive identification of pregnancy-associated deaths in Maryland. The increased awareness of maternal mortality in the State has resulted in more accurate completion of the death certificate to indicate a cause of death related to or aggravated by pregnancy. For the period 2000-2001, 88% of maternal deaths was identified by the death certificate alone (as compared to approximately 50% in previous years).

b) Maternal Mortality Review Proceedings

Maternal Mortality Review operates under the auspices of MedChi (the Maryland State Medical Society) and its Maternal and Child Health Committee, in partnership with the Center for Maternal and Child Health, DHMH. Since the passage of the Maternal Mortality Review bill in 2000, case reviews have been conducted in a more systematic and complete manner.

c) Chart Reviews of All 2000 and 2001 Pregnancy-associated Deaths

Table 1. Cases Abstracted by Maternal Mortality Review Committee

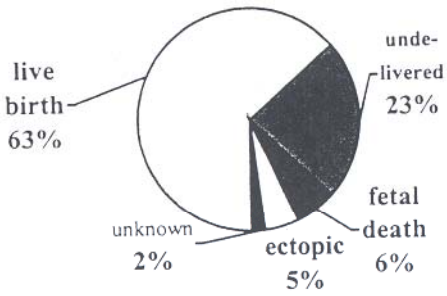
Cases Abstracted	Number
Pregnancy-associated cases 2000	35
Pregnancy-associated cases 2001	44
Suicide cases 1993-99 (does not include 3 suicides from 2000-01 above)	8
Total cases abstracted	**87**

A total of 79 pregnancy-associated deaths were identified by DHMH in 2000 and 2001 in Maryland. All available Maryland hospital (including prenatal) and outpatient records during the perinatal period and time of death were abstracted by an ob/gyn physician for each death. This process included:

i. Cooperation from every Maryland perinatal center in sharing records (this was greatly facilitated by passage of bills).

ii. Review of all available hospital records from time of death, delivery, and prenatal period. Outcomes of pregnancies included live birth (63%), fetal death (6%), ectopic pregnancy (5%), and undelivered (23%). There were no deaths identified due to abortion or molar pregnancy. (See Figure 2.)

Figure 2. Outcomes of Pregnancy-associated Deaths, Maryland, 2000-2001

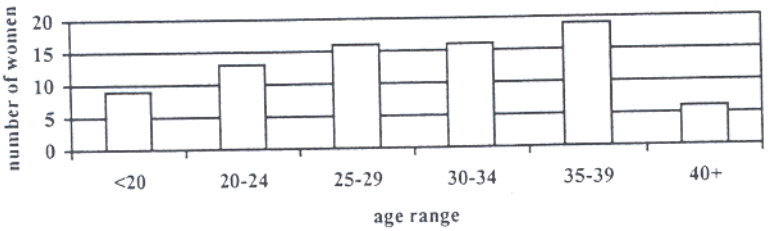


iii. Review of all available prenatal records when included in hospital chart.

iv. Review of all death certificates, medical examiner charts, and linkage certificates from live birth or fetal death.

Maternal ages ranged from 15 to 50 for the pregnancy-associated deaths in 2000 and 2001. The age distribution is shown in Figure 3. Of these mothers who died, 46% were White, 48% African American, 4% Asian, and 3% Hispanic.

Figure 3. Pregnancy-associated Deaths by Age Maryland 2000 and 2001



v. Development of template for reviewing records.

vi. Written summaries (that are de-identified of all patient, provider and institutional identifiers to maintain confidentiality) of all available medical record information for each death.

vii. The grouping of cases into categories based on cause of death to facilitate discussion. The most common categories of pregnancy-associated death for 2000-2001 were heart disease, homicide, substance abuse, and accidents (predominantly auto) and injury;

these accounted for over half of all deaths. (See Table 2.) These were followed by accidents/injury, cancer, hypertensive disorders of pregnancy, hemorrhage, embolism and suicide.

Table 2. Most Common Categories of Death
1. Cardiovascular Disease
2. Homicide
3. Substance Abuse
4. Injury/Accident

viii. Prioritization of cases for presentation before the Committee. Deaths due to the three leading categories - heart disease, homicide, and substance abuse – were prepared for presentation.

d) Chart Reviews of All Deaths Due to Suicide

Due to the recent tragedy of the Texas woman who suffered from postpartum psychosis and drowned her five children, records from all suicides (due to maternal depressions) were prepared for presentation. Since the number of suicides was small (0 in 2000, and 3 in 2001), all 11 suicides from 1993-2001 were reviewed.

e) Committee Review

A total of 37 cases were presented for review before the Committee at four meetings this past year. Eleven of these cases were presented in depth. This process included:

i. Categorization of cases for presentation by cause of death. Instead of the usual sequence of presentation of cases by time of occurrence, deaths were grouped according to cause of death. For 2000-2001, presentations were completed for deaths resulting from suicide, substance abuse, homicide, and cardiac disorders.

ii. Recruitment of specialists to review cases in their area of expertise (e.g. a cardiologist was present for review of cases with cardiac cause of death).

iii. Discussion of relatedness of death to pregnancy (e.g. whether the pregnancy was a mitigating factor or coincidental factor).

iv. Preventability of death.

v. Committee recommendations to prevent future deaths - potential point of intervention.

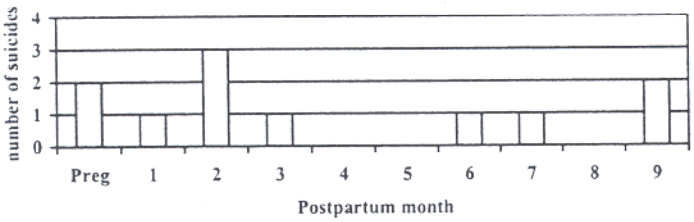
vi. Implementation of recommendations.

Example: Review of pregnancy-associated deaths due to suicide

Case abstraction:

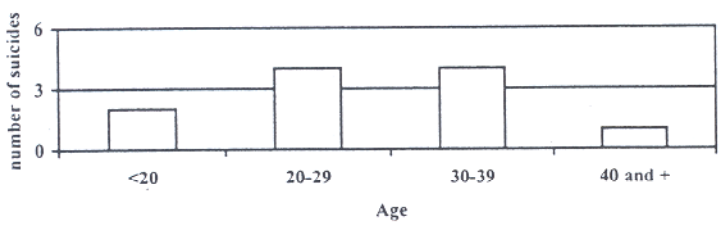
- Eleven cases of pregnancy-associated deaths due to suicide from 1993-2001 were discovered through death certificates, medical examiner records and linkage files. Hospital (including prenatal care records) and medical examiner charts were abstracted by an ob/gyn physician.

Figure 4. Suicides by Perinatal Time Period
Maryland 1993-2001



Two women committed suicide during their pregnancy, and nine committed suicide between 1-9 months postpartum.

Figure 5. Pregnancy-associated Suicides by Age
Maryland 1993-2001



By age, two suicides occurred to teens, four to women in their 20s, four to women in their 30s and one to a woman over 40. (See Figure 5.) Seven women who committed suicide were White, two were African American (both teens), and two were Hispanic.

Presentation before Committee:

- All 11 cases of pregnancy-associated suicide were presented before the Maternal Mortality Review Committee.
- Since the topic was suicide and postpartum depression, Dr. Glenn Treisman, Associate Professor of Psychiatry, Johns Hopkins School of Medicine, was invited to the Committee meeting for consultation.

- Relatedness to pregnancy.
  By strict definition (World Health Organization, CDC/ACOG Maternal Mortality Group), deaths due to suicide or any other injury are not "pregnancy-related and are not included in the MMR."
  Such a definition was considered too limiting in these cases since these women probably would not have died at that time if they had not been pregnant. The Committee decided to review cases outside this rigid definition when pregnancy may be a factor in the death.
- Preventability:
  All 11 cases of pregnancy-associated suicide were found to be potentially preventable because they were intentional. Dr. Triesman also discussed common reasons for sub-optimal treatment of depression such as being discharged too soon from hospital, discontinuation or failure to start medications, lack of awareness of condition by patients and physicians, inadequate psychiatric referral resources, stigma of mental health disorders resulting in delay of care.
- Recommendations by Committee:
  1. Heighten awareness of postpartum depression and depression during pregnancy among women, providers, and health care insurers (to allow women the necessary time needed for hospitalization) so women can get diagnosed and treated adequately.
  2. Educate obstetric and pediatric providers about the magnitude of postpartum depression and referral sources.
  3. Distribute local mental health referral sources for women's health providers and women in their region.

Implementation of Recommendations:

- Educational presentation was made to Maternal Mortality Committee on postpartum depression.
- Grand rounds and other presentations are being conducted and scheduled Statewide to consumers, providers and managed care organizations.
- Articles about postpartum depression have appeared in State newsletters (Perinatal Network, Infant Mortality Commission newsletter).
- Statewide distribution of the booklet entitled "Postpartum Depression" which was created by DHMH.
- Collection of other resource materials such as brochures and journal articles for women and providers.
- Referral list of mental health providers is being developed with the Maryland Psychiatric Association for mothers who need mental health providers during or after pregnancy.

- Collaboration with the Maternal Mental Health Consortium has been established to increase awareness of postpartum depression among providers in Maryland. The Family Mental Health Foundation, a member of the Maternal Mental Health Consortium, is conducting a pilot project at George Washington University and Georgetown University to screen women for postpartum depression. The national Naval Medical Center (Bethesda) and Shore Hospital System (Easton) are currently considering this project for use in their centers.

f) Discussion of State Maternal Mortality Review Legislation

Maryland was invited to participate in a national meeting sponsored by ACOG and the CDC for "Consideration of Model Law Development to Facilitate Review of Pregnancy-Related Deaths" held at ACOG in December 2001. The successful passage of House Bill 515 and Senate Bill 459 in the Maryland General Assembly in 2000 was viewed as a model in which State legislation facilitated the review of maternal deaths in the State.

g) State Presentations

Grand rounds presentations on "Safe Motherhood" were given at Johns Hopkins Hospital (February 2002) and University Hospital (February 2002) to medical students, residents and hospital faculty. The grand rounds at University Hospital were broadcast simultaneously to other hospitals and clinical centers Statewide. A presentation was also given in Salisbury (September 2002) for health professionals on the lower Eastern Shore.

IV. Future Recommendations

A. Continued Surveillance

Only by having a clear understanding of the magnitude and scope of pregnancy mortality can appropriate prevention strategies be formulated. The comprehensive system of surveillance developed by Maryland is used as a model for other states.

B. Formation of Subcommittee

Due to the number of maternal deaths, a Maternal Mortality Workgroup will be formed to continue reviewing 2000 and 2001 cases in which pregnancy-relatedness and preventability of deaths have yet to be determined. Cases that merit further discussion will be presented to the broader Maternal and Child Health Committee, which will also develop recommendations.

C. Implementation and Dissemination of Recommendations

Recommendations made for cases reviewed so far (due to substance abuse, homicide, suicides, and cardiac disorders) need to be structured for implementation. These also need to be publicized Statewide to providers and policy makers.

D. Report from Maternal Mortality Review Committee

In the following year, the Maternal Mortality Review Committee will release a report on cases reviewed, recommendations made, and potential points of intervention to prevent future deaths. This will guide providers, hospitals, facilities, appropriate agencies, and women and their families in safeguarding pregnancy health.

V. Summary

Maryland's maternal mortality ratio (MMR) has consistently been higher (worse) than the national average. In the past 15 years, the MMR in Maryland has generally risen, and in 2001, it is at its highest level since 1970. It is unclear whether this increase is due to an actual increase in maternal deaths; however, part of this increase is likely due to Maryland's recent comprehensive efforts at identification of maternal deaths. This has resulted in a significant increase in the number of maternal deaths that previously had not been identified. It has also resulted in a broadened number of cases reviewed by the Maternal Mortality Review Committee including medical causes (hemorrhage, hypertension, heart disease, and embolism) and non-medical causes (homicide, suicide, auto accidents, injury, substance abuse).

In this past year, all available medical records were abstracted for the 87 cases of pregnancy-associated mortality in 2000 and 2001 – the most it has ever abstracted in any one year. These cases were then grouped by cause of death. Those deaths that were due to suicide, substance abuse, homicide and heart disease were formally reviewed by the Committee. These cases accounted for nearly half of all pregnancy-associated deaths in 2000-2001. Present at each review were experts in that specialty (such as cardiologists and psychiatrists).

Recommendations for potential points of intervention now need to be implemented. For example, screening for postpartum depression and depression during pregnancy needs to be greatly promoted among providers so that women will receive appropriate treatment. Future implementation of this and other recommendations made by the Maternal Mortality Review Committee in the following year from their review of cardiovascular, homicide and substance abuse cases will ultimately help women have safer pregnancies in Maryland.