



OFFICE OF THE UNDER SECRETARY OF DEFENSE

4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND
READINESS

JUL 10 2019

The Honorable James. M. Inhofe
Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

The enclosed report is in response to Conference Report 115-874, page 861, accompanying the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115-232), which requests the Secretary of Defense to report on maternal and infant mortality rates in the Military Health System (MHS).

The enclosed report shows that rates of maternal and infant mortality in the MHS are lower than those of the National Perinatal Information Center member facilities, and of the United States overall. To build on its superior performance, the MHS is committed to decreasing maternal and infant mortality, and continues to seek opportunities to address causes of morbidity and mortality through the work of the Defense Health Agency Women and Infants Clinical Community (WICC). The WICC leads efforts to provide standardized, highly reliable, and safe care for mothers and infants through focused initiatives that target top causes of mortality in our military treatment facilities (MTFs). Additionally, to provide the highest quality maternity care for mothers outside MTFs, TRICARE is implementing and focusing efforts around value-based care initiatives.

Thank you for your interest in the health and well-being of our Service members, veterans, and their families. A similar letter is being sent to the House Armed Services Committee.

Sincerely,

A handwritten signature in blue ink that reads "James N. Stewart". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

James N. Stewart
Assistant Secretary of Defense for Manpower
and Reserve Affairs, Performing the Duties
of the Under Secretary of Defense for
Personnel and Readiness

Enclosure:
As stated

cc:
The Honorable Jack Reed
Ranking Member



OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND
READINESS

JUL 10 2019

The Honorable Adam Smith
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

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Thank you for your interest in the health and well-being of our Service members, veterans, and their families. A similar letter is being sent to the Senate Armed Services Committee.

Sincerely,

A handwritten signature in blue ink, reading "James N. Stewart", is positioned above the typed name and title.

James N. Stewart
Assistant Secretary of Defense for Manpower
and Reserve Affairs, Performing the Duties
of the Under Secretary of Defense for
Personnel and Readiness

Enclosure:
As stated

cc:
The Honorable William M. "Mac" Thornberry
Ranking Member

REPORT TO ARMED SERVICES COMMITTEES



Maternal and Infant Mortality Rates in the Military Health System

**Requested by: Conference Report 115-874, Page 861 to Accompany
the John S. McCain National Defense Authorization Act for Fiscal
Year 2019 (Public Law 115-232)**

**Office of the Secretary of Defense
July 2019**

The estimated cost of report or study for the Department of Defense (DoD) is approximately \$49,600 for the 2019 Fiscal Year.
This includes \$11,700 in expenses and \$37,900 in DoD labor. Generated on June 11, 2019. RefID: 8-0153FF6

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EXECUTIVE SUMMARY

This report is in response to the Conference Report 115–874, page 861, accompanying the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232), which requests the Secretary of Defense to provide a report on “maternal (pregnancy-related) and infant mortality rates in the direct and purchased care sectors of the Military Health System (MHS)” to the Armed Services Committees that: (1) Reports the maternal mortality rate (MMR) and infant mortality rate (IMR) in the MHS; (2) Discusses how the MHS rates compare with those in the United States; and (3) Describes recommendations including ongoing efforts to decrease MMR and IMR throughout the MHS.

Maternal and infant health are important indicators of the overall health of a nation. Accordingly, understanding MMR and IMR and the causes of mortality is critical to decreasing mortality and improving the overall health of a population. From January 2009 to June 2018, the overall MHS IMR was 2.51 deaths per 1,000 live births (range 2.00 deaths per 1,000 live births to 3.03 deaths per 1,000 live births), and was statistically significantly below the National Perinatal Information Center (NPIC) rate of 4.76 deaths per 1,000 live births; the NPIC is a nationwide voluntary obstetric quality improvement database. Annually, the MHS IMR remained consistently and significantly below the IMR for NPIC member facilities. Recently, from January to June 2018 (most current data available), the MHS IMR was 2.30 deaths per 1,000 live births and below the NPIC hospital network’s IMR of 3.93 deaths per 1,000 live births.

From January 2009 to June 2018, the pregnancy-related mortality ratio (PRMR) in the MHS overall, including the direct care (DC) and purchased care (PC) systems, was 7.40 deaths per 100,000 live births and statistically significantly lower than the NPIC comparative rate of 11.3 deaths per 100,000 live births. Additionally, the MHS PRMR is consistently below that of the United States for corresponding years reported by the Centers for Disease Control and Prevention (CDC). For calendar year (CY) 2014, the most updated PRMR available from the CDC, the U.S. PRMR was 18.0 deaths per 100,000 live births and was greater than twice the MHS PRMR of 7.56 deaths per 100,000 live births. Notably, for care provided directly in the inpatient military medical treatment facilities (MTFs), the PRMR for the 9.5-year time span was 3.32 deaths per 100,000 live births and statistically significantly below the NPIC comparative rate, while the PRMR for the PC system, or care provided outside of MTFs, was 10.2 deaths per 100,000 live births. The most updated data available from January to June 2018 reflects **no** maternal deaths reported in the DC system, a PRMR of 3.34 deaths per 100,000 live births in the PC system, and an MHS overall (DC and PC) PRMR of 2.08 deaths per 100,000 live births compared with the NPIC rate of 9.92 deaths per 100,000 live births. Many MTFs refer potentially complicated births to the PC network; thus, the difference between DC and PC PRMRs may be in part due to a disproportionate number of high risk patients receiving care in the PC system and deserves further study.

Despite generally lower rates of maternal and infant mortality compared with the United States overall and with NPIC member facilities, the MHS continues to actively work to decrease infant and maternal mortality. Within the Defense Health Agency (DHA), the Women and Infants Clinical Community (WICC) develops and leads work to provide standardized, highly

reliable, and safe care for mothers and infants through focused efforts which address top causes of mortality, e.g., postpartum hemorrhage (PPH) bundle and “Period of PURPLE Crying” initiatives. While the PPH rates for the DC system were higher than that of the NPIC member facilities in CY 2014, from CY 2015 to June 2018 (most currently available rates), the PPH rates for MTFs are consistently below those of NPIC hospitals. Additionally, through use of a PPH bundle, the Navy decreased hemorrhage-related transfusions by 5 percent, hysterectomies by 73 percent and intensive care unit (ICU) admissions by 8 percent in its hospitals. In the PC network, to provide the highest quality maternity care for mothers outside MTFs, TRICARE is implementing and focusing efforts around value-based care initiatives.

INTRODUCTION AND BACKGROUND

This report examines the MMR and IMR in the MHS and discusses how those rates compare with MMR and IMR in the United States. Additionally, this report describes recommendations including ongoing focused initiatives to decrease maternal and infant mortality throughout the MHS.

Maternal and infant health are important indicators of the overall health of a nation. Therefore, being aware of the rates and understanding the causes of maternal and infant mortality are crucial to decreasing mortality and improving the overall health of a population.^{1 2} The CDC defines infant mortality as “the death of an infant before his or her first birthday” and typically reports the IMR as deaths per 1,000 live births.³ The World Health Organization (WHO) defines “maternal death” 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 the pregnancy or its management but not from accidental or incidental causes.”⁴ The CDC MMR is aligned with the WHO definition, while the CDC’s PRMR extends the relevant time to 1 year and defines “pregnancy-related death” as “the death of a woman while pregnant or within one year of the end of a pregnancy – regardless of the outcome, duration or site of the pregnancy – from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.”⁵ While there are noted differences between the MMR and PRMR, as methods to identify and validate pregnancy-related deaths are improved, the values appear to be converging (Figure A).

Because data provided in this report does not specify death within 42 days of termination of pregnancy and attempts to include mortality which occurred during “pregnancy, childbirth and

¹ MacDorman MF, Mathews TJ. Behind international rankings of infant mortality: How the United States compares with Europe. NCHS data brief, no 23. Hyattsville, MD: National Center for Health Statistics. 2009.

² Mathews TJ, Driscoll AK. Trends in infant mortality in the United States, 2005–2014. NCHS data brief, no 279. Hyattsville, MD: National Center for Health Statistics. 2017.

³ Centers for Disease Control and Prevention. (2019, March 27). Infant Mortality. Retrieved on April 26, 2019 from <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm>.

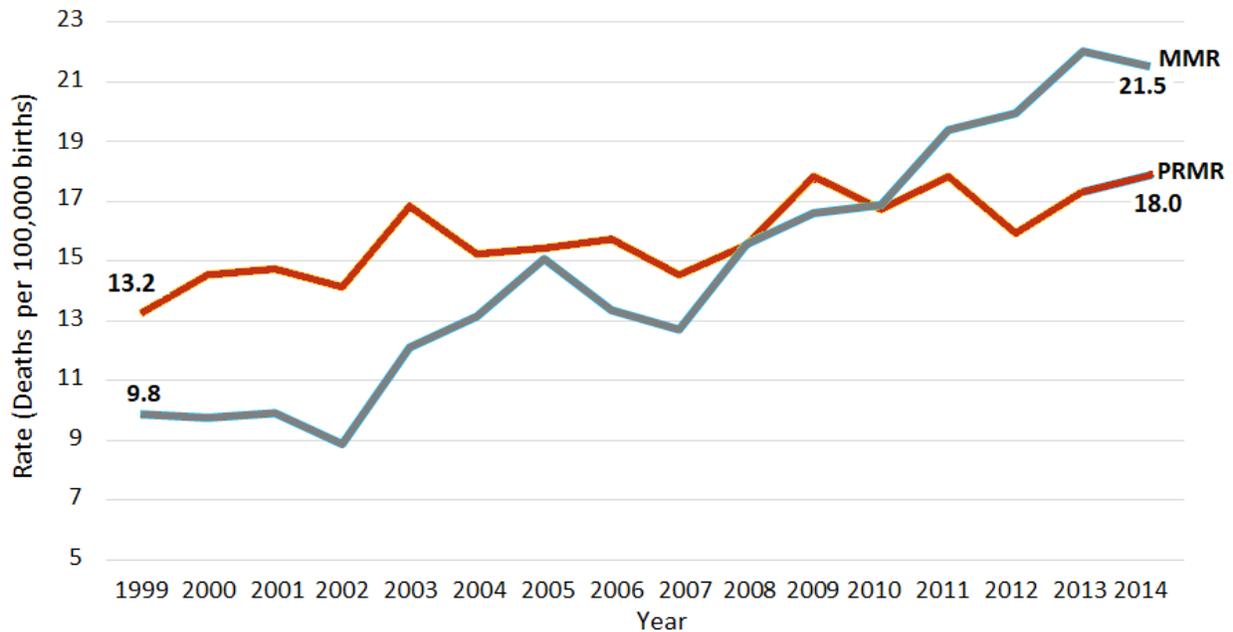
⁴ World Health Organization. (2018). Health statistics and information systems: Maternal mortality ratio (per 100 000 live births). Retrieved on April 23, 2019 from <http://www.who.int/healthinfo/statistics/indmaternalmortality/en>.

⁵ Centers for Disease Control and Prevention. (2018, August 7). Pregnancy mortality surveillance system. Retrieved on April 23, 2019 from <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-mortality-surveillance-system.htm>.

the puerperium,” the MHS maternal mortality data more closely aligns with the pregnancy-related mortality ratio and, therefore, will be compared with the U.S. and NPIC PRMRs.

Additionally, although not addressed in this report, there is evidence that the risk of death can vary by race, ethnicity, and age, suggesting that further analysis of demographics can be done to better understand and reduce pregnancy-related deaths.⁶

Figure A. PRMR and MMR in the United States, 1999-2014



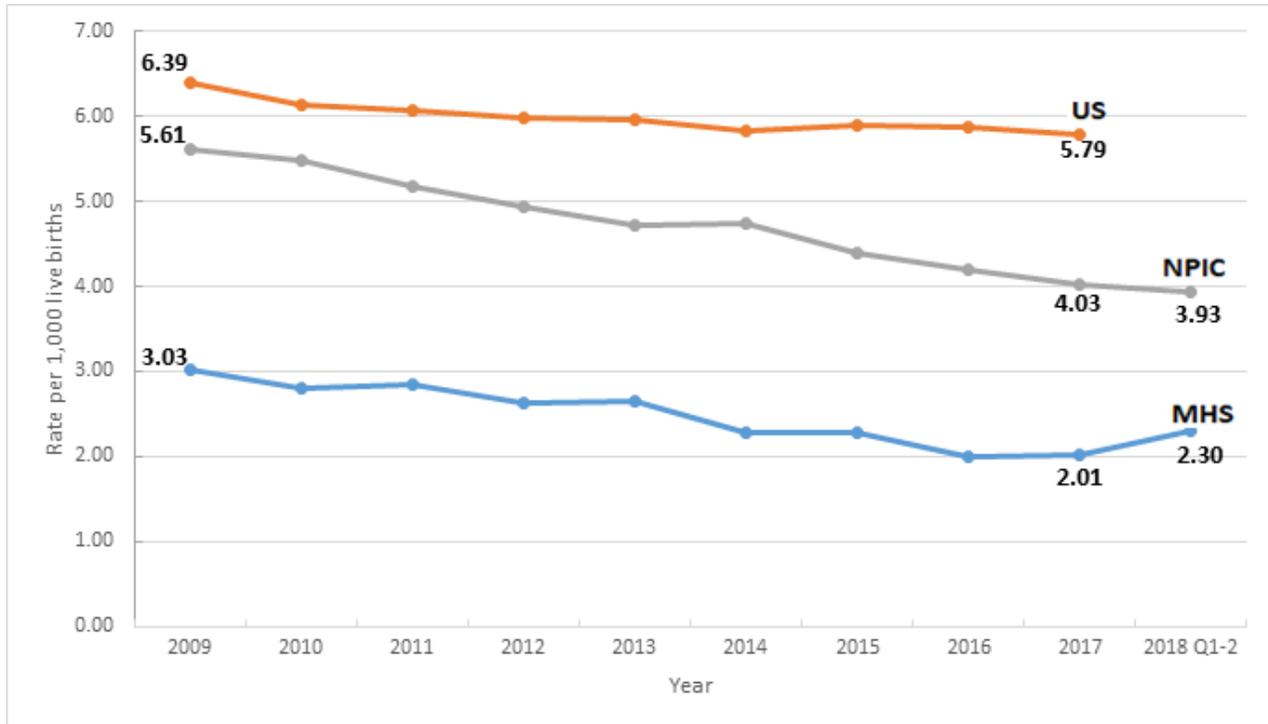
MMR AND IMR IN THE MHS AND COMPARISON WITH NATIONAL RATES

For 2017, the CDC reported 3,855,500 live births in the United States, while the MHS had an estimated 106,000 live births, approximately 60 percent of which occurred in the civilian or PC system and 40 percent in the DC system. On average, more than 100,000 births are observed each year among the 9.5 million beneficiaries of the MHS. The MHS, U.S., and NPIC IMR have continued to decrease over time, and the MHS IMR remained consistently below the U.S. and NPIC rates. The NPIC collects data and maintains a multi-state longitudinal maternal, fetal, neonatal proprietary database for analysis and comparative reporting to improve the quality of perinatal care. NPIC member hospitals report on greater than 725,000 discharges annually (representing near 10 percent of U.S. delivery volume across 27 states) and include academic and non-academic hospitals with annual deliveries ranging from 500 to 16,000 deliveries. Member hospitals range in care provided from basic to subspecialty levels of care.

⁶ Creanga AA, Berg CJ, Syverson C, Seed K, Bruce C, Callaghan WM. Race, ethnicity and nativity differentials in pregnancy-related mortality in the United States: 1993–2006. *Obstet Gynecol.* 2012;120(2),261-268.

The MHS IMR decreased from 3.03 deaths per 1,000 live births in 2009 to 2.01 deaths per 1,000 live births in 2017; the NPIC IMR decreased from 5.61 deaths per 1,000 live births in 2009 to 4.03 deaths per 1,000 live births in 2017; and the U.S. IMR decreased from 6.39 deaths per 1,000 live births in 2009 to 5.79 deaths per 1,000 live births in 2017. From January to June 2018, the IMR for the MHS was 2.30 deaths per 1,000 live births and was statistically significantly lower than the NPIC rate of 3.93 deaths per 1,000 live births (Figure B).

Figure B. IMR in the MHS, NPIC Member Hospitals, and United States



Previously, Haas et al published data on maternal mortality in the DoD from 1993-1998 and reported a military “maternal mortality ratio” of 5.5 deaths per 100,000 live births, which was lower than the CDC-reported national PRMR of 13.2 deaths per 100,000 live births in 1999 but did not meet the Healthy People 2010 goal of 3.3 deaths per 100,000 live births.⁷

From January 2009 to June 2018, the PRMR in the MHS overall, including the DC and PC systems, was 7.40 deaths per 100,000 live births and was lower than the NPIC comparative rate of 11.3 deaths per 100,000 live births. There is no corresponding data to compare with the U.S. PRMR for this time frame as the latest available data from the CDC is for 2014. However, for corresponding years that are available and reported by the CDC, the MHS PRMR is consistently below that of the United States. Comparing the rates for 2014, the U.S. PRMR of 18.0 deaths per 100,000 live births and the NPIC PRMR of 16.9 deaths per 100,000 live births were both more than double the MHS PRMR of 7.56 deaths per 100,000 live births (Figure C).

⁷ Haas DM1, Rivera-Alsina ME, McNamara MF. Maternal mortality in the U.S. Department of Defense, 1993-1998. J Reprod Med. 2005 Dec;50(12):951-3.

Of note, for care provided directly in the inpatient MTFs, the PRMR for the 9.5-year time span was 3.32 deaths per 100,000 live births and statistically significantly below the NPIC comparative rate, and the PRMR for the PC system, or care provided outside of MTFs, was 10.2 deaths per 100,000 live births and was also below, though not statistically significantly below, the NPIC average. The most updated data available from January to June 2018 reflect **no** maternal deaths reported in the DC system, a PRMR of 3.34 deaths per 100,000 live births in the PC system and an MHS overall (DC and PC) PRMR of 2.08 deaths per 100,000 live births, compared with the NPIC rate of 9.92 deaths per 100,000 live births (Figure D). While the PC PRMR was greater than the DC rate, the difference was not statistically significant. Furthermore, many MTFs refer potentially complicated births to the PC network, thus the difference between DC and PC PRMRs may be in part due to a disproportionate amount of high risk mothers receiving care in the PC system. Further analyses may offer additional insight.

Figure C. PRMR in the MHS, NPIC Member Hospitals, and United States

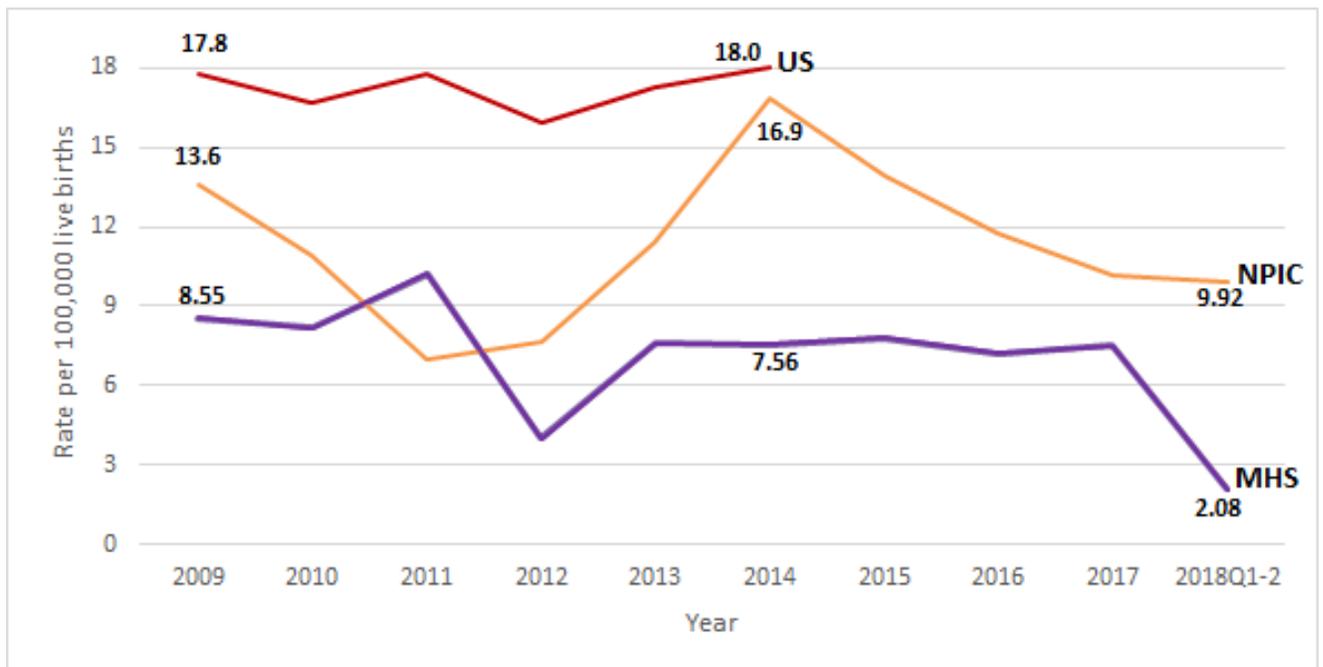
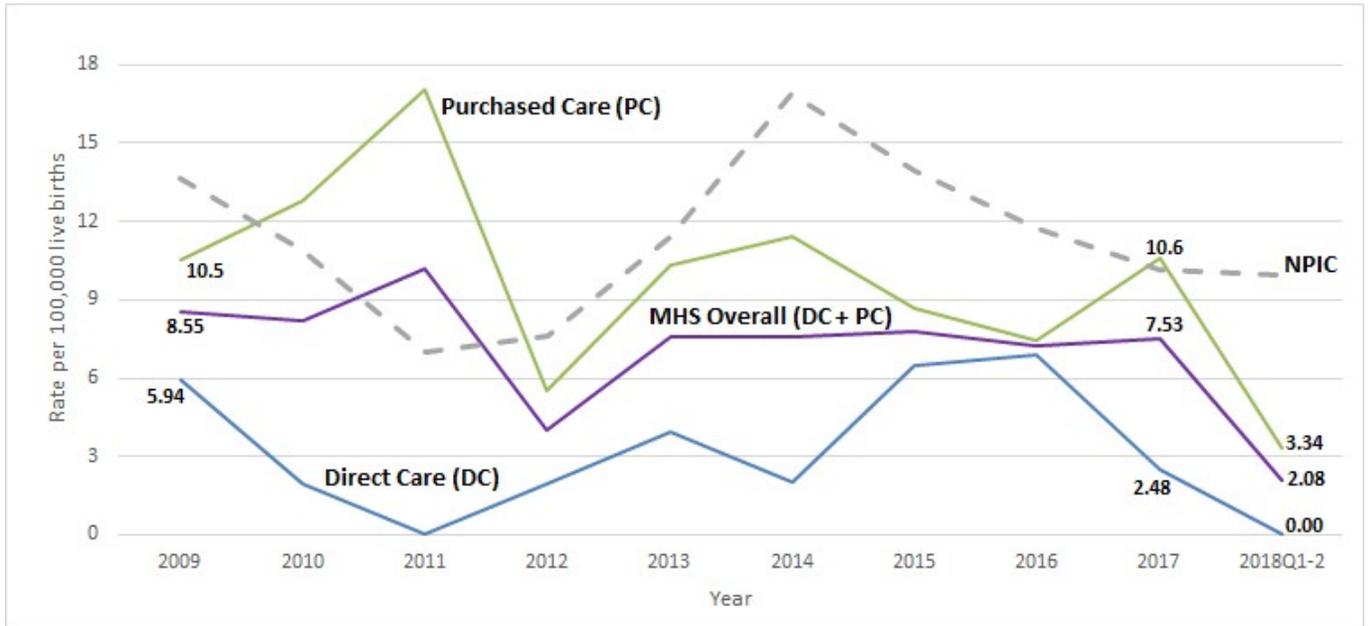


Figure D. PRMR in the DC System, PC System, and the MHS overall (DC+PC)



DECREASING INFANT AND MATERNAL MORBIDITY AND MORTALITY ACROSS THE MHS – WOMEN AND INFANTS CLINICAL COMMUNITY AND TRICARE RECOMMENDATIONS AND INITIATIVES

To build on its notably superior performance compared with NPIC members and the U.S. general population, the MHS continues to evaluate opportunities to decrease infant and maternal mortality, focusing efforts on the most common causes of maternal death including hypertension, hemorrhage and venous thromboembolism, and common causes of infant mortality such as injuries and sudden infant death syndrome (SIDS).

Per the CDC, the top causes of infant mortality include birth defects, preterm birth, maternal pregnancy complications, SIDS, and injuries. Examples of evidence-based interventions recommended in the MHS are included in Table 1.

Table 1. Recommendations and Interventions to Decrease Infant Morbidity and Mortality

Cause of infant mortality	MHS Recommendations and Interventions
Birth defects	Pregnancy and Childbirth, A Goal oriented Guide to Prenatal Care ⁸ ; provides standards for prenatal care delivered including pregnancy resource information on nutrition, immunizations, prenatal testing supplementation and food safety.
Preterm birth	Enterprise-wide adoption and utilization of American College of Obstetricians and Gynecologists (ACOG) clinical guidelines on prevention and treatment of preterm labor. ⁹
Maternal pregnancy complications	DoD/Department of Veterans Affairs (VA) Clinical Practice Guidelines, Management of Pregnancy (2018) ¹⁰ , implementation of maternal patient safety bundles.
SIDS	Enterprise-wide implementation of Safe to Sleep® (formerly “Back to sleep”) campaign ¹¹ collaboration by Federal Agencies and the American Academy of Pediatrics (AAP).
Injuries	Enterprise-wide implementation of postpartum education initiatives including the Period of PURPLE Crying ¹² to educate families on coping strategies to prevent child abuse.

There is a strong relationship between infant and maternal morbidity and mortality. Addressing maternal understanding of contributing factors is an important part of decreasing infant morbidity and mortality. Accordingly, standardized postpartum education practices have been developed and implemented by a collaboration of Federal agencies and the AAP in the Safe to Sleep® Campaign. Safe sleep, placing babies to sleep on their backs, and avoiding soft or loose bedding, is practiced and taught in all MTFs as role modeling behavior for parents. The Period of PURPLE Crying program is designed to help parents of babies better understand a developmental stage that is not widely known, providing education on the normal crying curve and on the dangers of shaking a baby. The acronym PURPLE is used to describe specific characteristics of an infant’s crying during this phase and reassure parents and caregivers that what they are experiencing is indeed normal and, although frustrating, is simply a temporary (hence the inclusion of the word “Period”) phase in their child’s development. The Period of PURPLE Crying program is part of all discharge teaching to mothers and families and helps them identify coping mechanisms to decrease injuries which may arise from child abuse.

In addition to the initiatives above, the MHS leverages numerous policies and guidelines developed and endorsed by the AAP, Federal, and international partners to inform and guide the care of infants and children. Bright Futures, an AAP product, has been integrated into MHS clinical processes for nearly a decade. Recommended schedules for periodic screening, vision services, and hearing services are part of the standard workflow and documentation for all well baby visits.

⁸ <https://pregnancy.cemmlibrary.org/Resource-Center/The-Purple-Book>.

⁹ <https://www.acog.org/Womens-Health/Preterm-Premature-Labor-and-Birth>.

¹⁰ <https://www.healthquality.va.gov/guidelines/WH/up/>.

¹¹ <https://www.healthychildren.org/English/ages-stages/baby/sleep/Pages/A-Parents-Guide-to-Safe-Sleep.aspx>.

¹² <http://www.purplecrying.info/>.

The DHA continues to support initiatives to decrease maternal morbidity and mortality through standardization, innovation, and collaboration with Federal, national, professional and advocacy organizations to identify and decrease maternal complications when they can affect incidence and severity for infant morbidity and mortality as well as those complications which independently affect mothers. Development of DHA Clinical Communities (CCs) enables front-line clinicians and nurses to participate and provide real-time feedback to optimize outcomes and eliminate harm by driving enterprise-wide performance improvements in readiness and health. CCs create, track, and share the conditions for high reliability (processes, standards, metrics, and cost) at the point of care by identifying and resolving unwarranted variation. Additionally, CCs foster a culture of safety and innovation. The WICC leads efforts to align MHS practices with recommendations from national programs, e.g., implementation of a patient safety bundle for obstetric hemorrhage recommended by the Alliance for Innovation on Maternal Health (AIM)¹³ program under the auspices of the Council for Patient Safety in Women's Health Care. The adoption of a standardized obstetric hemorrhage bundle has supported the MHS focus on readiness, recognition and prevention, response, and reporting and system learning.

The MHS has increased its efforts to address major causes of maternal mortality, beginning with increasing measuring, monitoring, and trending of the incidences of PPH, shoulder dystocia, and birth trauma through the use of the Agency for Healthcare Research and Quality's Prevention Quality Indicators (PQIs) since 2015. Since that time, there has been an overall decline in DoD Reportable Events, including The Joint Commission Sentinel Events, related to maternal events and reflects, generally, an overall safer environment for mothers and babies. Furthermore, continued efforts to decrease maternal complications, morbidity, and mortality related to PPH include adoption of standard definitions and tool kits developed by national groups. Of note, since CY 2014, when the PPH rate for the DC system was 5.0 percent and greater than the NPIC rate of 3.5 percent, the PPH rate for the DC system has decreased and remained consistently below that of NPIC non-Federal hospitals. The most recent data available in June 2018 reflect an MHS DC PPH rate of 4.1 percent and an NPIC PPH rate of 4.2 percent.

In addition to understanding and tracking the aforementioned PQIs, directly addressing the most common causes of maternal morbidity and mortality is critical to decreasing maternal deaths in the MHS. The most common causes of maternal death include cardiovascular diseases, hypertension, infections, and hemorrhage¹⁴, shown in Table 2.

¹³ <http://www.purplecrying.info/>.

¹⁴ <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-mortality-surveillance-system.htm>. Accessed 31 May 2019.

Table 2: Recommendations and Interventions to Decrease Maternal Morbidity and Mortality in the MHS

Cause of Maternal Mortality and Morbidity	MHS Recommendations and Interventions
Cardiovascular diseases	Referral to appropriate level of care: Maternal Fetal Medicine
Non-cardiovascular diseases; Maternal pregnancy complications	DoD/VA Clinical Guidelines, Management of Pregnancy (2018): AIM Obstetrical hemorrhage, Severe Hypertension and other patient safety bundles.
Infection or sepsis	National Patient Safety Goals (NPSG) on central line associated urinary tract infections and central line associated bloodstream infections; track and monitor maternal ICU admissions. Utilization of clinical practice guidelines.
PPH	Consolidation of the California Maternal Quality Care Collaborative (CMQCC) and AIM Obstetrical Hemorrhage Bundle implemented.
Severe Maternal Morbidity and Mortality Reviews	Promote system identification and implementation of improvements in care.

According to a study by the CMQCC on maternal deaths in California from 2002 to 2005, up to 41 percent of cases reviewed had a “good-to-strong chance” of being preventable, particularly cases involving hemorrhage or hypertension.¹⁵ The WICC adopted concepts from the CMQCC and the AIM in the DC system to decrease maternal mortality. Although PPH rates are increasing nationwide, the MHS can prevent some of the complications and morbidity, thereby decreasing adverse outcomes for our mothers and families through rapidly assessing, treating, and understanding the severity of cases of hemorrhage. Through enterprise-wide adoption of standardized elements recommended by national and state collaborative entities, the MHS has decreased its incidence of PPH and remains below the civilian benchmark.

Continuous process improvement initiatives should include further standardization of processes across the enterprise using leading practices developed with emerging clinical, scientific, and patient safety advances in patient care. Though the focus is on prevention, recognition, and treatment of maternal and infant morbidity and mortality, many of the initiatives implemented have core tenets that improve provider and system response to all obstetric emergencies through standardization of communication, policies, and equipment, training/drills, and learning systems. Ongoing evaluation to identify ways to standardize care for additional causes of maternal morbidity and mortality is being approached with the same attention to evidence, research, and collaboration, nationally and internationally, with the ultimate goal of “zero preventable harm.”

¹⁵ Main EK, McCain CL, Morton CH, Holtby S, Lawton ES. Pregnancy-related mortality in California: causes, characteristics, and improvement opportunities. *Obstet Gynecol.* 2015 Apr;125(4):938-47.

As MTFs are transitioned under the management responsibility of the DHA, specific recommendations for actions to be taken by the DHA to decrease infant and maternal morbidity and mortality in the DC system include:

- 1. Enterprise-wide adoption of standardized education initiatives for infant care to include anticipatory guidance.** To date, this is partially in place with the Safe to Sleep® Campaign and the Period of PURPLE Crying program.
- 2. Enterprise-wide availability of resources for parents and families concerned about health and illness.** Efforts are ongoing, e.g., the TRICARE Nurse Advice Line is a call center which is available 24 hours a day, seven days a week (24/7).¹⁶
- 3. Enterprise-wide implementation of guidelines and screening / treatment schedules, developed and endorsed by nationally-recognized professional organizations, in newborn and pediatric documentation systems and to inform evidence-based clinical practice.** Work is ongoing in collaboration with advocacy groups semiannually, and benefits review annually. Additionally, further engagement is recommended in ongoing collaborations with AIM, CMQCC, Association for Women’s Health, Obstetrics and Neonatal Nursing; ACOG and Institute for Healthcare Innovation through guidance of the WICC.
- 4. Standardization of perinatal quality data reports, to include maternal and neonatal data.** Since 2008, the MHS has engaged with the NPIC to collect neonatal data, and other work is ongoing with MHS tracking of NPSG.
- 5. Enterprise-wide implementation of standardized Severe Maternal Morbidity and Mortality Reviews to identify opportunities for systems-level improvements.**
- 6. Enterprise-wide implementation of Levels of Maternal Care to standardize hospital capabilities and align with national CDC-led efforts.**

In addition to the initiatives and efforts of the WICC in the DC system, the MHS has implemented and focused efforts in the PC system. For instance, TRICARE has implemented a maternity care value-based project that focuses on identifying the highest quality maternity care facilities, providing this information to beneficiaries, and also incentivizing these providers. Maternity data is utilized from The Leapfrog Group,¹⁷ an organization that rates civilian hospitals nationwide (note: while the DC system will report maternity data for all MTFs, PC facilities have the option to report maternity data). Top performing facilities are denoted on the TRICARE Network Directory that is available to beneficiaries with either a gold or silver stork, with the goal of encouraging beneficiaries to use these providers. Once MTFs report Leapfrog maternity data, they will be included if they are top performing facilities. Facilities that have a high volume of complex deliveries are also designated. TRICARE is also working to incentivize these highest quality providers financially, thus reimbursing for quality as opposed to volume.

¹⁶ <https://tricare.mil/ContactUs/CallUs/NAL.aspx>.

¹⁷ <http://www.leapfroggroup.org/>.

Beyond the value-based pilot described above, which focuses on facility-level metrics, the TRICARE East Region Managed Care Support Contractor launched a *New Beginnings* program which keys in on beneficiary health risks. Beneficiaries enrolled in *New Beginnings* receive prenatal education and guidance from the earliest stages of pregnancy up to 6 weeks following the birth, or longer for infants requiring neonatal intensive care. Specially trained case managers coordinate all care for the enrollees throughout their pregnancy and coordinate clinical services with the beneficiaries' providers.

Furthermore, serious reportable events, including severe injury and death in childbirth, are reviewed by the Managed Care Support Contracts (MCSCs); DHA quality representatives participate in these reviews.

With the majority of deliveries occurring in the PC network, specific recommendations for actions to be taken by the DHA to decrease infant and maternal morbidity and mortality in the PC system include:

- 1. Determination of perinatal quality and outcome metrics that MCSCs will report to the DHA in order to provide comparable data between PC and DC related to perinatal/ pregnancy outcomes.**
- 2. Identification of additional value-based pilot studies or initiatives to incentivize use of high value maternity services and top performing providers; subsequent enterprise-wide implementation of those effective initiatives.**
- 3. Expansion and alignment of available resources, e.g., prenatal and postnatal messaging and education initiatives, from the DC system to pregnant beneficiaries enrolled to a PC provider or who are using TRICARE Select (e.g., the DHA offers MTFs an educational series of evidence-based materials on pregnancy, the postpartum period, and early child development; information can be customized to the MTF, and pregnant women receive weekly e-mails about prenatal health and wellness, which continue after the child is born. Approximately 45 MTFs are currently enrolling their pregnant beneficiaries in this program, and continued efforts to increase enrollment capability are underway).**

CONCLUSIONS/SUMMARY

Maternal and infant health, particularly mortality, reflects the health of a population and the care provided by the MHS. While the rates of maternal and infant mortality in the MHS are lower than those of the U.S. overall and of NPIC member facilities, the MHS is committed to further decreasing maternal and infant mortality, and hence continues to seek opportunities to address causes of morbidity and mortality in mothers and infants. Within the DHA, the WICC leads work to provide standardized, highly reliable and safe care for mothers and infants through focused efforts which target top causes of mortality, e.g., PPH bundle and "Period of PURPLE Crying" initiatives within the MTFs. Additionally, to provide the highest quality maternity care for mothers outside MTFs, TRICARE is implementing and focusing efforts around value-based care initiatives.

LIST OF ACRONYMS

AAP	American Academy of Pediatrics
ACOG	American College of Obstetricians and Gynecologists
AIM	Alliance for Innovation on Maternal Health
CC	Clinical Community
CDC	Centers for Disease Control and Prevention
CMQCC	California Maternal Quality Care Collaborative
CY	Calendar Year
DC	Direct Care
DHA	Defense Health Agency
DoD	Department of Defense
ICU	Intensive Care Unit
IMR	Infant Mortality Rate
MCSC	Managed Care Support Contract
MHS	Military Health System
MMR	Maternal Mortality Rate
MTF	Military Medical Treatment Facility
NPIC	National Perinatal Information Center
NPSG	National Patient Safety Goals
PC	Purchased Care
PPH	Postpartum Hemorrhage
PQI	Prevention Quality Indicator
PRMR	Pregnancy-Related Mortality Ratio
SIDS	Sudden Infant Death Syndrome
VA	Department of Veterans Affairs
WHO	World Health Organization
WICC	Women and Infants Clinical Community