Maternal Health & Safety Initiatives

As Required by

Texas Health and Safety Code,

Section 34.0156, 34.0158, and

1001.262

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Executive Summary

The Texas Department of State Health Services (DSHS) submits this report to update the Texas Health and Human Services Commission (HHSC) Executive Commissioner and the chairs of the standing committees of the Texas Senate and the Texas House of Representatives with primary jurisdiction over public health and human services on activities required in legislation from the 85th (2017) and 86th (2019) Sessions. DSHS' required activities can be found in amendments to Health and Safety Code (HSC), Sections 34.0156, 34.0158, and Chapter 1001, Subchapter K, as well as the 2020-21 General Appropriations Act, House Bill (HB) 1 (Article II, Health and Human Services, Rider 28).

DSHS conducts multiple public health initiatives aimed at improving maternal outcomes within its Healthy Texas Mothers and Babies (HTMB) framework. HTMB activities include facilitating the Maternal Mortality and Morbidity Review Committee and the Texas Collaborative for Healthy Mothers and Babies, TexasAIM initiative, High-Risk Maternal Care Coordination Services Program (HRMCCSP) Pilot, and Maternal Health and Safety Awareness, Education, and Communication Campaign.

DSHS continues to lead the TexasAIM initiative, recruiting 219 hospitals (as of September 2020) to participate in using the Obstetric Hemorrhage Bundle, representing more than 98 percent of all hospitals with obstetric services in Texas (approximately 99 percent of state births, and 10 percent of national births). For those hospitals participating in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative, preliminary findings show improvements in process and quality measures.

As the first cases of COVID-19 in Texas were announced, DSHS and partners leveraged the TexasAIM Plus Learning Collaborative to support hospital obstetric units with COVID-19 response. DSHS held multiple webinars with participating hospitals, featuring experts in public health preparedness and infectious disease, and developed online information, resources, and a bi-weekly electronic newsletter.

Additionally, DSHS piloted the AIM Obstetric Care for Women with Opioid Use Disorder Bundle; began implementation of the HRMCCSP Pilot; and began development of the Maternal Health and Safety Awareness, Education, and Communication Campaign.

DSHS makes the following recommendations to improve the effectiveness of maternal health and safety initiatives:

- Continue both the TexasAIM initiative and the HRMCCSP Pilot.
- Integrate a health equity framework and principles of respectful care across all TexasAIM Initiative programs.
- Identify opportunities to alleviate barriers hospitals face in implementing maternal health and safety improvements and with participation in TexasAIM, with a focus on rural hospitals.
- Continue coordination with HHSC on resources related to the leading contributors to maternal mortality and morbidity.
- Engage with health care providers and health service providers in ambulatory care settings, emergency health services, emergency departments, and non-obstetric hospital settings.
- Promote TexasAIM implementation and successes with external partners.

1. Introduction

Health and Safety Code, Chapter 34, related to the Texas Maternal Mortality and Morbidity Review Committee, directs the Department of State Health Services (DSHS) to support Texas health care providers in using best practices to prevent maternal death, serious illness, or injury associated with pregnancy. Statute requires DSHS to submit a report on multiple initiatives regarding implementation, outcomes, and recommendations to the Executive Commissioner of the Health and Human Services Commission and members of the legislature by December 1 of each even-numbered year. During the 85th (2017) and 86th (2019) Legislatives Sessions, multiple bills were passed that allowed the DSHS to build on the agency's work related to maternal mortality and morbidity:

- Senate Bill (SB) 17, 85th Legislature, First Called Session, 2017, amended Health and Safety Code (HSC), Section 34.0156 directing DSHS to create a maternal health and safety initiative to support Texas health care providers in using best practices to prevent death, serious illness, or injury associated with pregnancy.
- SB 436, 86th Session, Regular Session, 2019 amended HSC Section 34.0158, Opioid Use Disorder Maternal and Newborn Health Initiatives directing DSHS to implement similar maternal health and safety initiatives to support health care providers to incorporate best practices for care of pregnant and postpartum women with opioid use disorder.
- SB 748, 86th Session, Regular Session, 2019, amended HSC Chapter 1001, Subchapter K, directing DSHS to develop, implement, and report on the progress of a High-Risk Maternal Care Coordination Services Program (HRMCCSP) Pilot study.
- The 2020-21 General Appropriations Act, House Bill (HB) 1 (Article II, Health and Human Services, Rider 28) requires DSHS to develop an educational campaign to increase public awareness and maternal mortality and morbidity prevention activities.

As allowed by statute, DSHS has combined updates for the above activities into a single report. This report provides a summary of the agency's TexasAIM initiative to use maternal patient safety bundles from the Alliance for Innovation on Maternal Health (AIM) Program to improve maternal health and safety related to obstetric hemorrhage, severe hypertension in pregnancy, and the obstetric care of women

with opioid use disorder (related to HSC §34.0156 and §34.0158). These conditions are leading contributors to preventable severe maternal morbidity and maternal mortality in Texas. Additionally, the report provides a summary of the development and next steps for implementation of the HRMCCSP Pilot study, as directed by HSC Chapter 1001. Finally, in accordance with the 2020-21 General Appropriations Act, this report also provides information on the Maternal Health & Safety Awareness, Education, and Communication campaign.

2. Background

The Texas Maternal Mortality and Morbidity Review Committee (MMMRC) reports that a complex interaction of factors across multiple levels of society contribute to maternal mortality, racial and ethnic disparities persist, and more than three-quarters of pregnancy-related deaths are potentially preventable.

Within the Healthy Texas Mothers and Babies (HTMB) framework, the Department of State Health Services (DSHS) has utilized the MMMRC's findings and recommendations to inform maternal health and safety initiatives outlined in this report into specific actions. In 2017, DSHS launched the TexasAIM initiative in response to the MMMRC's recommendation to promote a culture of safety and high reliability in Texas birthing facilities. DSHS identified the Alliance for Innovation on Maternal Health (AIM) Program as a promising approach and best practice for improving outcomes related to the most preventable and frequent causes of severe maternal morbidity and mortality.

In addition, the MMMRC and DSHS Joint 2018 Biennial Report recommendations included enhancing screening and referral for maternal risk conditions, prioritizing care coordination for pregnant and postpartum women, and increasing maternal health programming to target high-risk populations.

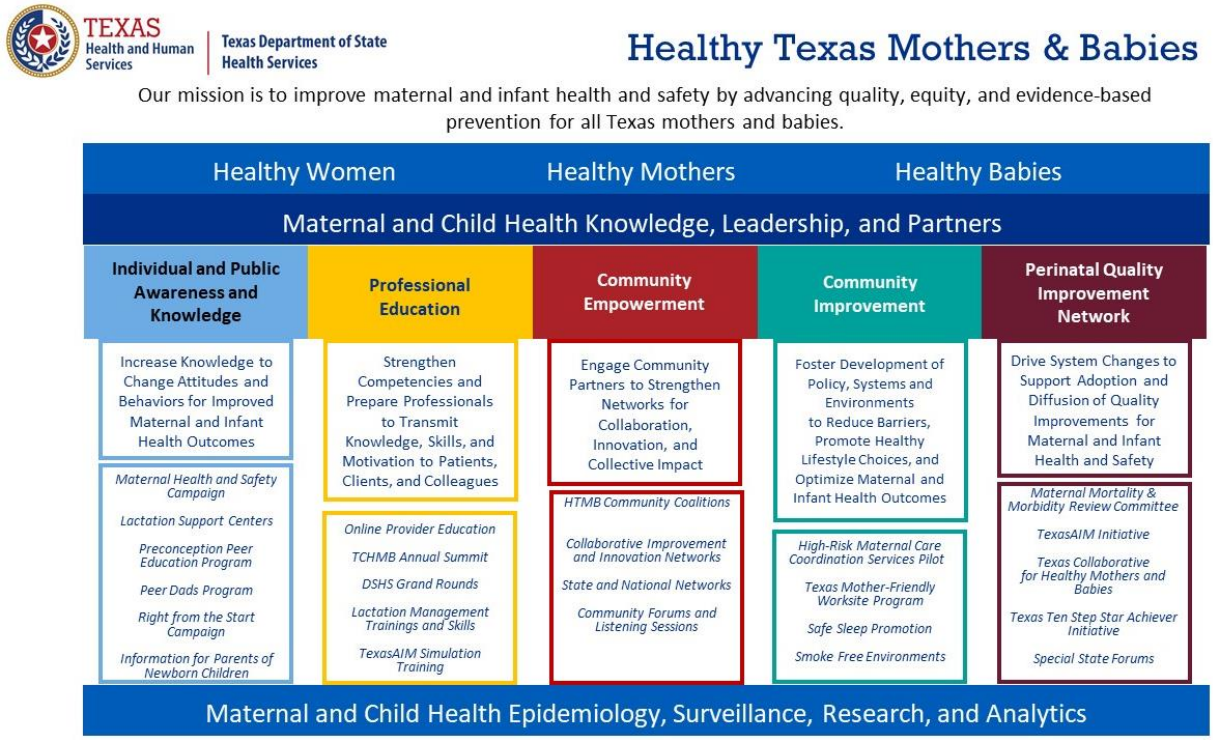
The Legislature bolstered the capacity of DSHS to support the development and implementation of these efforts through the 2020-21 General Appropriations Act, House Bill (HB) 1 (Article II, Health and Human Services, Rider 28). The Appropriations Act appropriated annually, over the biennium:

- $1.33 million and six full time equivalents (FTEs) to implement maternal safety initiatives statewide;
- $1.17 million and two FTEs to develop and establish the High-Risk Maternal Care Coordination Services Program Pilot; and
- $1 million to increase public awareness and prevention activities for maternal health.

3. Maternal Health and Safety Initiatives

The Department of State Health Services (DSHS) implements multiple public health initiatives to support safer pregnancy, postpartum, and interpregnancy periods for Texas mothers. These initiatives are organized within a framework called Healthy Texas Mothers and Babies (HTMB), which is funded by the Title V Block Grant (Figure 1).[1]

Figure 1 - Healthy Texas Mothers and Babies Framework



[1] As part of the Social Security Act of 1935, Title V is the nation's longest running public health program. Title V is a partnership between the federal government and the states/territories in which funding is used to implement programs to improve the health & well-being of our nation's mothers, children and families.

HTMB Framework

The core components of the HTMB Framework fall within five categories: 1) Individual Public Awareness and Knowledge, 2) Professional Education, 3) Community Empowerment, 4) Community Improvement, and 5) Perinatal Quality Improvement Network.[2] The HTMB framework includes the following activities:

Texas Maternal Mortality and Morbidity Review Committee (MMMRC)

Administered by DSHS, Health and Safety Code, Section 34.002 established the 17-member multidisciplinary MMMRC to study case information to identify contributing factors and preventability of pregnancy-related deaths. The MMMRC uses findings from the review of cases and statewide data trends to develop recommendations for preventing maternal mortality and morbidity. DSHS and the MMMRC published the Maternal Mortality and Morbidity Review Committee and Department of State Health Services Joint Biennial Report on December 1, 2020.

Texas Collaborative for Health Mothers and Babies (TCHMB)

DSHS funds and supports the TCHMB, the state's perinatal quality collaborative.[3] The TCHMB seeks to advance health care quality and patient safety for all Texas mothers and babies, through the collaboration of health and community stakeholders in the development of joint quality improvement initiatives, the advancement of data- driven best practices, and the promotion of education and training.

Recent changes in the TCHMB governance structure have facilitated better coordination with state partners and alignment of resources to support improvements in maternal health and safety. These changes include the expansion of the leadership structure to incorporate Perinatal Care Region/Regional Advisory Council representation and key non-voting organizational advisory members, such as the Texas Hospital Association (THA); the Texas Medical Association; American

[2] The Perinatal Quality Improvement Network is a network of partnerships that coordinate to drive adoption and diffusion of health care quality improvements for maternal and infant health and safety.

[3] A perinatal quality collaborative is a state or multi-state network of teams working to improve the quality of care for mothers and babies.

College of Obstetricians and Gynecologists District XI; the Association of Women's Health, Obstetric and Neonatal Nurses; the Texas Association of Community Health Centers; and the Texas Pediatric Society.

High-Risk Maternal Care Coordination Services Program (HRMCCSP) Pilot

HSC Chapter 1001, Subchapter K directs DSHS to develop, implement, and report on the progress of an HRMCCSP Pilot study, and has the following requirements:

- Assess training courses provided by promotoras or community health workers (CHWs) that target women of childbearing age;
- Study existing models of high-risk maternal care coordination services;
- Identify, adapt, or create a risk assessment tool to identify pregnant women who are at a higher risk for poor maternal outcomes;
- Develop training courses to prepare CHWs to support women at high risk for poor birth outcomes;
- Identify a pilot site and provide support, resources, technical assistance, training, and guidance to implement the HRMCCSP; and
- Integrate CHW services for women with high-risk pregnancies.

DSHS studied and assessed 27 CHW curricula courses and 40 care coordination models. None of the CHW curricula courses primarily focused on risk assessment, care coordination for high-risk pregnancies, or improving maternal health outcomes. Care coordination models, including those specific to high-risk pregnancies, varied in terms of who was responsible for care coordination, where the service was embedded (clinical, community, or both), how "high risk" was defined, and the package of services available. Maternal health outcomes were not measured in any of the models that incorporated CHWs in care coordination services. Models most often addressed high-risk pregnancy in terms of infant health outcomes and few included information about maternal health outcomes.

DSHS assessed tools used by CHWs or other non-clinical health workers to screen for high-risk pregnancies by identifying common categories of screening items, including the categories of risk factors the tools are used to screen for. As with the CHW curricula and care coordination models, these tools were primarily designed for use during intake for programs focused on improving infant health outcomes.

DSHS is working to develop specifications for pilot curricula, create educational materials for CHWs, identify an appropriate pilot site, and initiate contract procurement processes with a goal of initiating a two-year HRMCCSP pilot study by or before September 2021.

DSHS is receiving support and expertise to develop an evaluation plan for the HRMCCSP Pilot through a Maternal and Child Health Evaluation Practicum opportunity offered by the Centers for Disease Control and Prevention Division of Reproductive Health, Harvard's T.H. Chan School of Public Health, and the Association of Maternal and Child Health Programs. The design and implementation of the pilot evaluation will focus on assessing feasibility and acceptability of the interventions being tested while using rapid-cycle testing and scaling of the model.

Maternal Health and Safety Awareness, Education, and Communication Campaign

The 2020-21 General Appropriations Act, House Bill (HB) 1 (Article II, Health and Human Services, Rider 28) requires DSHS to develop an educational campaign to increase public awareness and maternal mortality and morbidity prevention activities. The goals of the Maternal Health and Safety Awareness, Education, and Communication Campaign are to:

- Increase awareness across multiple levels of society about risks and protective factors for maternal health;
- Increase awareness and knowledge about best- and promising practices in maternal health and safety and steps Texans can take to propel these practices into action; and
- Increase will and motivate action to build a maternal health and safety culture for Texas.

Through a contract established in May 2020, market research has been conducted with Texas women and key maternal health stakeholders to develop and evaluate messaging and communication methods. Work is underway to develop marketing and educational materials, a campaign website, a media strategy, and a robust outreach strategy. DSHS will use existing programs and partnerships as well as new strategies to engage communities in the campaign.

4. TexasAIM Initiative

As referenced in the 2018 Maternal Health and Safety Initiatives report, the Department of State Health Services (DSHS) launched the TexasAIM initiative in partnership with the Alliance for Innovation on Maternal Health (AIM), and the Texas Hospital Association (THA) to support Texas hospitals in adopting AIM-endorsed maternal safety bundles to address leading causes of maternal mortality in Texas. DSHS started TexasAIM with programming to support hospitals with the Obstetric Hemorrhage (OBH) Bundle, followed by activities to pilot the Obstetric Care for Women with Opioid Use Disorder (OB-OUD) Bundle, with plans to launch programming for the Severe Hypertension in Pregnancy Bundle in December 2020 and for the Obstetric Care for Women with Opioid Use Disorder (OB-OUD) Bundle in 2021.

The goals of the TexasAIM initiative are to:

- Achieve participation from more than 75 percent of Texas birthing facilities;
- Engage 50 percent or more participating birthing facilities in a Learning Collaborative;
- Support Texas birthing facilities with tools and technical assistance in quality improvement as they implement AIM Bundles; and
- Foster partnerships to develop and align infrastructure and resources to support TexasAIM goals.

As of September 2020, DSHS has recruited 219 hospitals to participate in the OBH Bundle, representing more than 98 percent of all hospitals with obstetric services in Texas (approximately 99 percent of state births, and 10 percent of national births). See Appendix A for a map of all participating hospitals and Appendix B for additional enrollment statistics.

Obstetric Hemorrhage Bundle

OBH is the leading cause of maternal mortality worldwide, is a leading contributor to severe maternal morbidity (SMM) and is one of the most preventable causes of

maternal death.[4,5] TexasAIM supports hospitals to implement the OBH Bundle to reduce the incidence of SMM associated with OBH. Hospital participation is voluntary, and hospitals may choose to join one of two levels of participation: TexasAIM Basic or TexasAIM Plus. Hospitals that participate at the Basic level receive the fundamental tools to adopt AIM Bundles, and TexasAIM Plus hospitals participate in an OBH Learning Collaborative.

TexasAIM Plus OBH Learning Collaborative

DSHS uses the TexasAIM Plus OBH Learning Collaborative as the method for providing support to hospitals for process and quality improvement to implement the OBH Bundle. Use of a collaborative model to support hospitals with implementation of AIM Bundles has been shown to reduce rates of SMM and narrow racial disparities.[6] Of the 219 TexasAIM hospitals, 181 (83 percent) participate in the TexasAIM Plus OBH Learning Collaborative.

Before launching the collaborative, DSHS selected the TexasAIM Plus OBH Learning Collaborative Faculty team through a competitive application process. The volunteer faculty are experts in health care quality improvement, implementation of core OBH improvement strategies, and coaching, mentoring, and team-based learning who provide coaching to hospitals implementing the OBH Bundle. A list of the OBH faculty can be found in Appendix C.

As part of the OBH Learning Collaborative, DSHS held three separate two-day in-person learning session meetings in each of the five cohort regions. During these

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[4] Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. *Obstet Gynecol*. 2017;130(4):e168-e186. doi:10.1097/AOG.0000000000002351

[5] Examples of diagnoses and complications associated with obstetric hemorrhage that constitute severe maternal morbidity include transfusion of 4 or more units of blood, return to the operating room for any major procedure, an emergency/unplanned peripartum hysterectomy, uterine artery embolization, and/or admission to an intensive care unit for invasive monitoring or treatment.

See Obstetric Care Consensus No 5 Summary: Severe Maternal Morbidity: Screening And Review. *Obstet Gynecol*. 2016;128(3):670-671. doi:10.1097/AOG.0000000000001635

[6] Main EK, Chang SC, Dhurjati R, Cape V, Profit J, Gould JB. Reduction in racial disparities in severe maternal morbidity from hemorrhage in a large-scale quality improvement collaborative. *Am J Obstet Gynecol*. 2020; 223(1):e1-123.e14.

meetings, hospital teams:

- Received coaching from faculty about details of the OBH Bundle components;
- Worked with their team members to establish plans and strategies for continuous process improvement;
- Engaged in facilitated shared learning activities, simulations, and networking to identify practical approaches and resources for OBH Bundle implementation; and
- Heard from speakers who gave their first-hand experiences of surviving OBH morbidity.

DSHS also conducted monthly action period calls between learning sessions to provide additional coaching, reinforce Bundle content and implementation strategies, and share practical examples from participating hospital teams. Additionally, DSHS developed and disseminated a bi-weekly newsletter with announcements and resources, and hospital teams could also access tools, resources, and shared information through an online collaboration platform.

TexasAIM COVID-19 Response

Beginning in March 2020, DSHS leveraged collaborative activities as the agency and Texas hospitals diverted resources to preparedness and response activities for the novel coronavirus disease 2019 (COVID-19) pandemic.

DSHS refocused the TexasAIM Plus OBH Learning Collaborative infrastructure to support hospital obstetric units with the response to COVID-19 by launching a series of calls on March 20, 2020 to provide information about obstetric care and COVID-19. DSHS continued to share information and strategies during weekly webinars through the first half of May, bi-weekly webinars through June, and a final webinar in September 2020 (see Appendix D).[7] DSHS also facilitated information and resource sharing among hospitals and developed online information, resources, and a bi-weekly electronic newsletter.

Based on feedback from participating hospitals, the TexasAIM Plus OBH Learning Collaborative resumed regular activities in September 2020. The TexasAIM initiative will continue to update hospital teams on evidence and practice guidance related to

[7] More information on Obstetric Care & COVID-19 Webinars can be found at gotostage.com/channel/texasaim-covid-19.

COVID-19, as well as other new and emerging issues relevant to maternal health and safety.

Maternal Early Warning System (MEWS)

DSHS partnered with the Texas Collaboration for Healthy Mothers and Babies (TCHMB) to implement the MEWS component of the OBH Bundle. TCHMB provided MEWS education, materials, and technical assistance to hospital teams throughout the OBH Learning Collaborative.[8,9] Education included a series of three webinars and a DSHS Grand Rounds Presentation, as well as in-person presentations at the OBH learning sessions across the state.

Additional TexasAIM Training Opportunities

DSHS coordinated with John Hopkins University, American College of Obstetricians and Gynecologists' AIM (ACOG-AIM), the Armstrong Institute for Patient Safety and Quality, and additional partners to organize two consecutive one-day continuing education events in five locations across Texas: TexasAIM *Practicing for Patients Obstetric Hemorrhage* Simulation Program and AHRQ Safety Program for Perinatal Care-II, Phase 2 (SPPC-II) workshop.[10] All Texas hospitals with obstetric services were invited to attend at no cost.

To help hospitals continue to implement regular unit-based drills and debriefs of simulated obstetric emergencies, DSHS will provide a simulation kit—including the birthing simulator tools used during the trainings—to every TexasAIM hospital.

Data Collection and Program Outcomes

To measure quality improvement, hospitals use the AIM National Data Center portal to report quarterly on process and structure measures specific for each Bundle.

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[8] According to the National Partnership for Maternal Safety, a maternal early warning system is a protocol to support "timely recognition, diagnosis, and treatment for women developing critical illness."

[9] Maguire PJ, Power KA, Turner MJ. The maternal early warning criteria: a proposal from the National Partnership for Maternal Safety. *Obstet Gynecol*. 2015;125(2):493-494. doi:10.1097/AOG.0000000000000660

[10] The TexasAIM *Practicing for Patients Obstetric Hemorrhage* Simulation Program was a Training-of-the-Trainer model.

Teams also have the option to report monthly on additional process measures through the THA TexasAIM Plus OBH Process Improvement data portal. DSHS uses aggregated data to identify areas for targeting efforts to provide additional support. See Appendix E for detailed information on measures.

Preliminary data show that hospitals participating in the TexasAIM Plus OBH Learning Collaborative and reporting on quarterly measures have made substantial improvements since the learning collaborative began. TexasAIM Plus hospitals show the following results:

- A 50 percent increase in hospitals reporting having obstetric hemorrhage supplies readily available.
- A 153 percent increase in developing standardized practice procedures for responding to potential hemorrhages using a stage-based response
- A 194 percent increase in the number of hospitals reporting they regularly perform formal debriefs after cases with major complications.
- A 180 percent increase in the number of hospitals with an established process to perform multidisciplinary systems-level reviews on all potential cases of SMM.
- A 204 percent increase in the number of hospitals reporting routine performance (90 percent or more of births) of risk assessments.
- An 823 percent increase in the number of hospitals reporting routine performance (90 percent or more of births) of cumulative and quantitative measurement of blood loss from delivery through recovery.

Hospitals have reported increased competency and self-efficacy in running unit based simulated drills and overall increased frequency of use of drills. However, 74 percent of Plus and Basic hospitals responding to a recent TexasAIM initiative survey report that the ability to run postpartum hemorrhage simulations has been impacted by COVID-19. Staff provided support through webinars (Appendix D).

To assess the impact of hospital team involvement in the TexasAIM OBH Program on patient outcomes, it is important to measure the percentage of women who experienced an OBH during their inpatient delivery hospital stay (delivery hospitalization) whose hemorrhage resulted in SMM. Two AIM outcome measures are used to provide information about SMM associated with hemorrhage: *Severe*

Maternal Morbidity among Hemorrhage Cases; and *Severe Maternal Morbidity among Hemorrhage Cases Morbidity.*[11]

Hospitals enrolled in TexasAIM by or before October 1, 2020, excluding those hospitals that had enrolled but subsequently closed their obstetric service lines show a 14 percent decrease in the rate of *Severe Maternal Morbidity among Hemorrhage Cases Morbidity* between the intervention period and baseline.[12]

While more data points are needed to determine whether there was a statistically significant improvement, hospital implementation of the OBH Bundle is anticipated to result in decreased rates of SMM, maternal mortality, and racial ethnic disparity gaps.

Next Steps

A "Leadership Summit and Kickoff Meeting" will be held in December 2020 to highlight the successes of the TexasAIM OBH Program and to mark the launch of the TexasAIM Plus Severe Hypertension in Pregnancy (HTN) Learning Collaborative. DSHS is also working to adapt OBH and HTN Bundles for the needs of birthing center settings and has resumed planning for development of a birthing center pilot program.

DSHS and the TexasAIM Plus Faculty Chair (also the Chair-elect of TCHMB) are working with the TCHMB to develop a collaboration framework to better align efforts to address regionally- and locally- specific issues that impact hospitals' implementation of AIM Bundles.

Obstetric Care for Women with Opioid Use Disorder Bundle

HSC Section 34.0158, Opioid Use Disorder Maternal and Newborn Health Initiatives directs DSHS to implement maternal health and safety initiatives to support health care providers to incorporate best practices for care of pregnant and postpartum women with opioid use disorder. DSHS implemented the AIM OB-OUD Bundle to satisfy these requirements.

[11] Excludes cases with only a transfusion code.
[12] Ibid.

The OB-OUD Bundle differs significantly from the other AIM Bundles. The OBH and HTN Bundles are built upon established best practices that have been tested and proven in the field in diverse practice settings and across states. Likewise, resources on implementation from early adopters of these Bundles were disseminated for use by other lead coordinating entities.

The practice concepts in the OB-OUD Bundle are rooted in both established and emerging evidence and theory and were grouped together through an expert consensus process. However, at the time of release, few, if any, entities had fully implemented the collection of practices together, and technical resources/guidance to support implementation of the Bundle were not available. The OB-OUD Bundle also requires hospitals to partner and coordinate care with outpatient providers.

In June 2018, DSHS recruited ten pilot "early adopter" hospitals (Appendix F) with experience or strong interest in providing care to women with opioid use disorder to test implementation of the OB-OUD Bundle once it was released by ACOG-AIM in August 2018. These hospitals worked independently to convene OB-OUD improvement teams to plan and begin pilot implementation of components of the Bundle while also participating in the TexasAIM Plus OBH Learning Collaborative.

Beginning in the fall of 2019, DSHS initiated a series of activities with pilot hospitals to learn about the current state of OB-OUD Bundle implementation, including hospitals' perceptions of feasibility for implementing Bundle components, operational considerations, their experiences generally, and lessons learned to date.

DSHS and THA hosted a meeting in October 2019 with OB-OUD pilot hospital teams to perform gap analysis, brain-storming, and process mapping exercises to identify opportunities to improve obstetric care for women with opioid use disorder. Hospital teams then participated in a series of five collaborative calls to share experiences and discuss implementation barriers and knowledge gaps.

Participating pilot hospitals were added to the AIM National Data Center's OB-OUD portal so that they could begin entering data specific to the Bundle.

DSHS began conducting qualitative research interviews in the summer of 2020 with select hospital leaders to capture the lessons learned from their experiences implementing the OB-OUD Bundle components. The timeline for this research has been impacted by delays related to COVID-19 but will continue through February 2021 with findings available by May 2021. DSHS is applying lessons learned from these activities, in consultation with state and national experts, to support

implementation of OB-OUD practice changes in Texas hospitals and surrounding communities. DSHS is also identifying available resources and developing an OB-OUD implementation framework and a toolkit.

DSHS plans to launch an OB-OUD Learning Collaborative in spring 2021 to support the early adopter hospitals and will continue to plan for the subsequent rollout of the TexasAIM Plus OB-OUD Learning Collaborative in cohorts across the state.

5. Recommendations

In accordance with Health and Safety Code, Section 1001.265 and Section 34.0156, the Department of State Health Services (DSHS) makes the following recommendations to improve the effectiveness of maternal health and safety initiatives.

Continue support of the High-Risk Maternal Care Coordination Services Program (HRMCCSP) Pilot

DSHS recommends the HRMCCSP pilot continue as currently authorized to permit DSHS to develop specifications for pilot curricula, create educational materials for community health workers, identify an appropriate pilot site, and initiate contract procurement processes.

DSHS anticipates this pilot to be completed by September 2023, when the statute expires. Evaluation of the pilot will inform future recommendations for implementation.

Integrate a health equity framework and principles of respectful care across all TexasAIM Initiative programs.

Assurance of equitable care is recognized as one of the six essential domains of health care quality.[13] DSHS is working to identify expertise and build programming to incorporate established approaches to support health care organizations to improve equity.[14] American College of Obstetricians and Gynecologists' (ACOG) Alliance for Innovation on Maternal Health (AIM) Program is currently working to develop a plan to integrate respectful care, which will include a focus on racial equity, across each AIM-supported Bundle.

[13] Institute of Medicine Committee on Quality of Health Care in America. (2001). Crossing the Quality Chasm: A New Health System for the 21st Century. National Academies Press.

[14] For example, Wyatt R, Laderman M, Botwinick L, Mate K, Whittington J. *Achieving Health Equity: A Guide for Health Care Organizations*. IHI White Paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2016. (Available at ihi.org)

Identify opportunities to alleviate barriers hospitals face in implementing maternal health and safety improvements and with participation in TexasAIM, with a focus on rural hospitals.

While rural hospitals bring many unique strengths to the work of maternal health and safety improvement and substantially contribute to the TexasAIM Plus Learning Collaborative, they also face unique challenges. DSHS is partnering with THA and other stakeholders in rural health to plan a rural hospital maternal safety forum in 2021. This forum will focus on identifying needs, challenges, and opportunities of rural hospitals for implementing maternal health and safety initiatives. DSHS will share findings from the meeting with Texas Health and Human Services Commission (HHSC) and work with HHSC and other partners to identify opportunities to alleviate the barriers rural hospitals face.

Continue coordination with HHSC on resources related to the leading contributors to maternal mortality and morbidity.

DSHS and HHSC currently coordinate through several partnerships related to maternal health, including management and treatment of substance use disorder, perinatal depression and mood disorders, high-risk maternal care, and chronic disease among women of childbearing age. DSHS recommends these partnerships continue to support ongoing communication, coordination and collaboration between DSHS and HHSC on shared priorities in women's and maternal health.

Engage with health care providers and health service providers in ambulatory care settings, emergency health services, emergency departments, and non-obstetric hospital settings.

Engagement should promote the following strategies:

- Recognition of urgent maternal warning signs and of other urgent conditions that may affect pregnant and postpartum women, including overdose;
- Appropriate escalation of maternal health emergencies; and
- Consultation with obstetric providers to coordinate emergency health services for pregnant and postpartum women.

While hospital teams work to coordinate with other departments within their facilities, many maternal health emergencies occur after women are discharged and return home for routine care. The aforementioned strategies should be

implemented across specialties and health care settings that provide services to women of childbearing age.

Promote TexasAIM implementation and successes with external partners.

External partners play a vital role in the TexasAIM initiative's recruitment and retention of hospitals and subject-matter experts. By promoting the TexasAIM initiative among external partners, DSHS will increase the initiative's capacity to maintain and build upon their achievements.

6. Conclusion

The Department of State Health Services (DSHS), in collaboration with partners throughout Texas and the nation, continues to conduct several activities related to maternal health and safety.

Since August 2018, the TexasAIM initiative has provided information, resources, and collaborative learning opportunities to support hospitals in their implementation of patient care practices in the Alliance for Innovation on Maternal Health (AIM) Obstetric Hemorrhage Bundle. Preliminary findings are promising and support continuation of the TexasAIM initiative.

Efforts are underway to build upon successes and lessons learned to implement TexasAIM programming that supports hospitals to adopt the patient practices outlined in the AIM Obstetric Care for Women with Opioid Use Disorder and Severe Hypertension in Pregnancy Bundles.

To prepare for the implementation of the DSHS High-Risk Maternal Care Coordination Services Program (HRMCCSP) pilot study, DSHS has completed assessments and inventories of existing community health worker curricula, risk assessment tools for high-risk pregnancies, and high-risk pregnancy care coordination models. DSHS is currently developing the programmatic components and evaluation strategy for the HRMCCSP pilot. DSHS anticipates that the HRMCCSP pilot study will begin in September 2021.

DSHS has conducted market research and received stakeholder input to support its efforts to develop and implement a comprehensive *Maternal Health and Safety Awareness, Education, and Communication Campaign*. The campaign will integrate diverse outreach efforts to engage stakeholders with the goal of fostering a culture of maternal health and safety in Texas to increase public awareness about maternal mortality and morbidity and related prevention activities in Texas. The public components of the campaign will begin in Spring 2021.

List of Acronyms

Acronym	Full Name
4 Rs	Readiness, Recognition and Prevention, Response, and Reporting and Systems Learning
ACOG	American College of Obstetricians and Gynecologists
AHRQ	Agency for Healthcare Research and Quality
AIM	Alliance for Innovation on Maternal Health
CHW	Community Health Workers
COVID-19	Coronavirus Disease 2019
DSHS	Department of State Health Services
FTEs	Full Time Equivalents
HB	House Bill
HHSC	Texas Health and Human Services Commission
HRMCCSP	High-Risk Maternal Care Coordination Services Program
HSC	Health and Safety Code
HTMB	Healthy Texas Mothers and Babies
HTN	Hypertension
MEWS	Maternal Early Warning System
MMMRC	Texas Maternal Mortality and Morbidity Review Committee
OB	Obstetric

OBH	Obstetric Hemorrhage
OB-OUD	Obstetric Care for Women with Opioid Use Disorder
PCR	Perinatal Care Region
RAC	Regional Advisory Council
SMFM	Society for Maternal-Fetal Medicine
SMM	Severe Maternal Morbidity
TCHMB	Texas Collaborative for Healthy Mothers and Babies
THA	Texas Hospital Association

Appendix A. TexasAIM Initiative Overview

In December 2017, DSHS applied to enroll as an "AIM State" to the American College of Obstetricians and Gynecologists' (ACOG) AIM Program and was selected as the lead coordinating entity for implementing AIM maternal safety bundles in Texas.

Each bundle organizes healthcare practices to be implemented into four patient care domains used by AIM to address quality care. These practice domains (also known as the "4 Rs") include *Readiness*, *Recognition and Prevention, Response*, and *Reporting and Systems Learning*. When implemented together, the practices within the 4 R domains are expected to reduce incidence of preventable cases of severe maternal morbidity (SMM) and mortality, which are the worst possible outcomes that can result from maternal conditions such as obstetric hemorrhage (OBH), severe hypertension in pregnancy, and obstetric opioid use disorder.[15,16]

In June 2018, DSHS launched the TexasAIM initiative as a large-scale quality improvement effort using existing staffing and resources including Title V Block Grant funding.[17] DSHS partners with ACOG-AIM, the Texas Hospital Association (THA), the Texas Collaborative for Healthy Mothers and Babies (TCHMB), and other key partners to implement TexasAIM.

To address the leading and most preventable causes of SMM and maternal mortality in Texas, TexasAIM began with a focus on the OBH Bundle and will add programming to support hospitals with implementation of the Severe Hypertension

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[15] There is not a single consensus definition of SMM. According to ACOG and the SMFM, SMM can be generally thought of as "unintended outcomes of the process of labor and delivery that result in significant short-term or long-term consequences to a woman's health." In the absence of a single, comprehensive definition of severe maternal morbidity, ACOG and SMFM provide guidance and recommendations for health care institutions to screen for and conduct multi-disciplinary quality review of potential cases of preventable SMM to identify opportunities for improvement.

[16] Obstetric Care Consensus No 5 Summary: Severe Maternal Morbidity: Screening And Review. *Obstet Gynecol*. 2016;128(3):670-671. doi:10.1097/AOG.0000000000001635

[17] As a part of the Social Security Act of 1935, Title V is the nation's longest running public health program. It is a partnership between the federal government and the states/ territories that uses funding to implement programs to improve the health & well-being of our nation's mothers, children and families.

in Pregnancy (HTN) Bundle program and the full roll-out of the Obstetric Care for Women with Opioid Use Disorder (OB-OUD) Bundle.

Hospital participation in TexasAIM is voluntary. Participating hospitals may choose to join one of two levels of participation: TexasAIM Basic or TexasAIM Plus. Hospitals that participate at the Basic level receive the fundamental tools to adopt AIM Bundles. All enrolled hospitals commit to forming a quality improvement team within their hospitals for implementing the Bundles, reporting structure and process measures in the AIM National Data Center portal, and participating in TexasAIM surveys. TexasAIM Basic hospitals work independently to adopt AIM Bundle practice changes. TexasAIM provides them with access to webinars, annual networking events, and technical assistance upon request. DSHS and THA continue their outreach efforts to engage non-enrolled hospitals and to provide information to hospitals that have enrolled at the Basic level about the benefits of participation at the TexasAIM Plus level.

TexasAIM provides programming to support hospitals enrolled at the Plus level with process and quality improvement through shared learning and collaboration using the Institute for Health Care Improvement (IHI) Breakthrough Series (BTS) Collaborative Model for Achieving Breakthrough Improvement.[18] TexasAIM Plus Learning Collaboratives create a structured framework for incremental rapid-cycle improvement, access to a team of expert faculty who have experience with, and provide coaching in, implementing practice changes for improvement in the topic, and a network of support from partnering hospitals for accelerated improvement through collaborative learning to support uptake of the AIM Bundles' recommended practices by participating hospital improvement teams.

TexasAIM Plus hospitals complete all the TexasAIM Basic requirements and report on the same quarterly measures but may also report on additional TexasAIM monthly process improvement measures. In the Learning Collaborative, hospitals identify goals for improvement and make plans to achieve them. Participating TexasAIM Plus hospitals receive access to quality- and process- improvement training and guidance as well as practical information about the Bundles' components from experts. They have access to shared learning and support of their

[18] *The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement.* IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement; 2003. (Available on www.IHI.org)

peers across the state through in-person Learning Session (LS) meetings, networking calls, peer-to-peer mentoring, targeted coaching, online toolkits and discussion boards, a bi-weekly newsletter, and other supports, resources, and partnerships including support with using monthly and quarterly data to drive their improvement.

TexasAIM Plus hospitals are assigned to one of five geographic cohorts for in-person LSs. DSHS based cohorts on Public Health Regions, Perinatal Care Region (PCR)/Regional Advisory Council (RAC) territories, and the number of hospitals per geographic area. Each cohort has 30-50 participating hospitals.

Figure A-1. TexasAIM Plus Cohorts by Perinatal Care Region

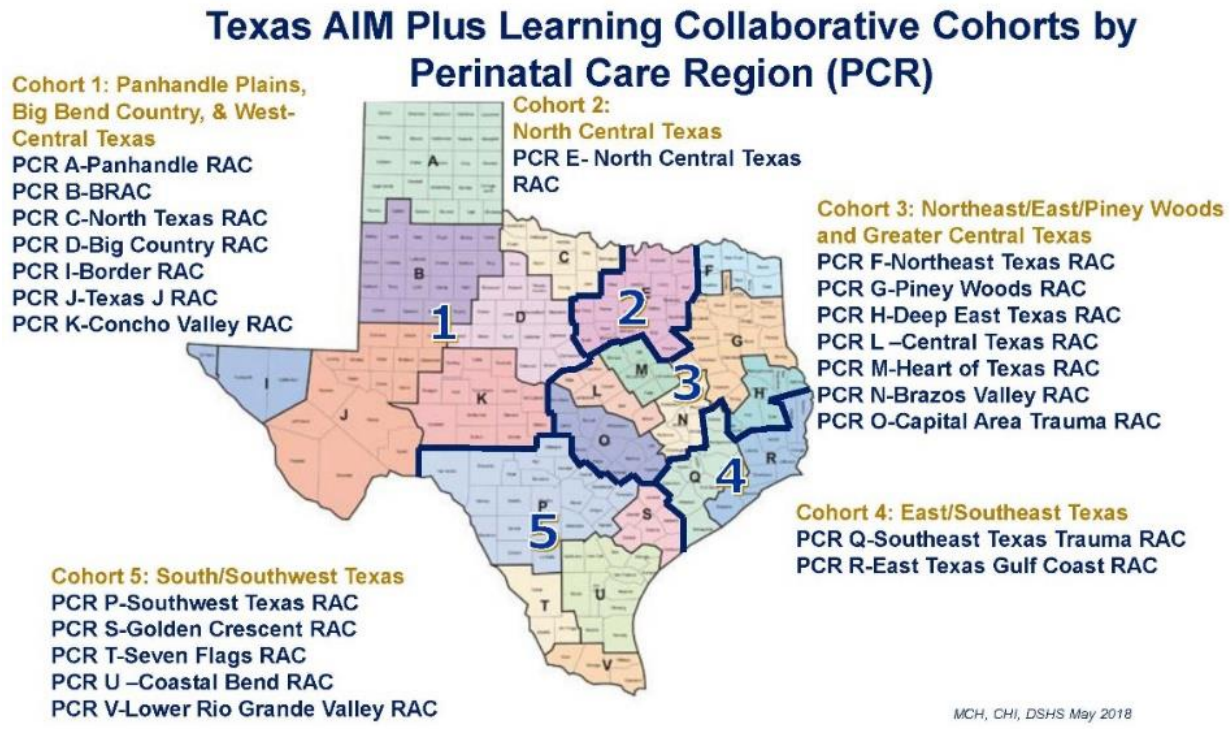
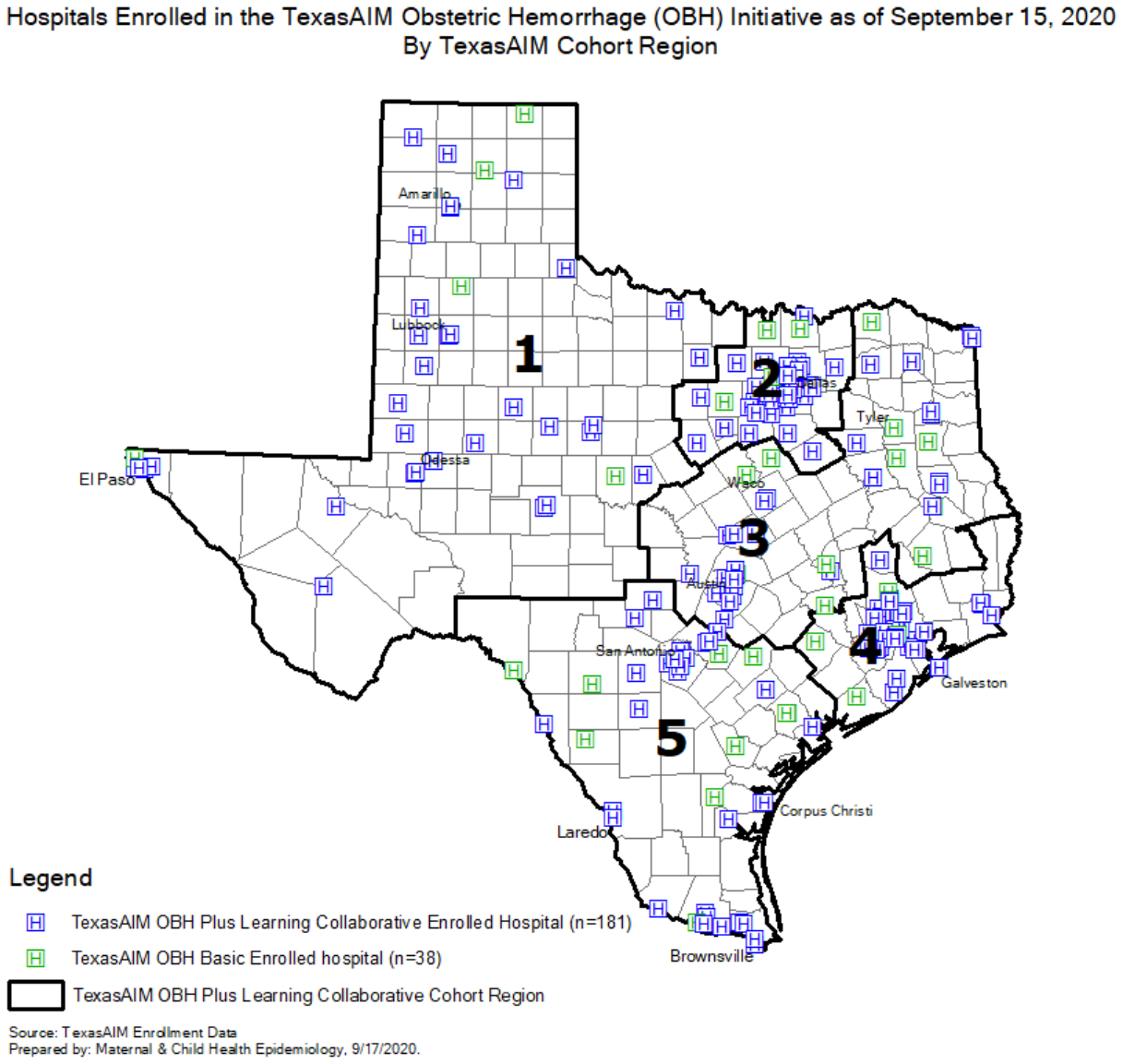


Figure A-2 - TexasAIM Hospitals by TexasAIM Cohort Region as of September 15, 2020



TexasAIM Hospital Improvement Team Testimonial

"So, we experienced our first very big hemorrhage last week. Mother was a G5 had a C-section came back and within an hour started bleeding heavily. Her uterus would not get firm no matter what we did on the nursing side. The physician came quickly and determined it was uterine atony. Our staff acted super quickly utilizing our hemorrhage cart and flow sheets we have in place."

"All the things that y'all have taught us that we have taught our staff came into play. [The Director] and I got to be present and help as well but mostly our staff were the ones running the hemorrhage code. The mother ending up losing around 4 L of blood but from quick acting and thinking on our staff's part her vital signs never crashed and she did very well after a [tamponade] balloon was placed. She ended up going home two days later. She cried and thanked the staff for saving her life. Even coming back up to the hospital with her family so they could thank us for saving her."

"Seeing how everything we have learned from y'all truly came together and we had no major hiccups it was so amazing to watch. Staff came up to us after and thanked us over and over for all we have taught them through TexasAIM and how grateful they were to have that knowledge. [The Director] and I just wanted to say how thankful we are for your team and this bundle. It not only helped us save a mother's life the other day it really has brought so much knowledge and skill to this facility."

Appendix B. TexasAIM Enrollment Statistics

Enrollment Among Texas Hospitals with Obstetric Service Lines:

TexasAIM Basic Hospitals: 38 (17% of 219 TexasAIM hospitals are enrolled as Basic)

TexasAIM Plus Hospitals: 181 (83% of 219 TexasAIM hospitals are enrolled as Plus)

Total TexasAIM Hospitals: 219 (98% of Texas hospitals with obstetric service lines are enrolled in TexasAIM)

Geographic Area:

Rural Hospitals: 92% of Texas hospitals in rural counties are enrolled in TexasAIM (20 Basic, 37 Plus)

Urban Hospitals: 100% Texas hospitals in urban counties are enrolled in TexasAIM (18 Basic, 144 Plus)

Table B-1. TexasAIM Hospital Cohort Enrollment Statistics

Cohort	Number of Enrolled Hospitals in Cohort	Percent of Total Enrolled Hospitals that are in Cohort	Percent of Participating Hospitals in the Cohort that are Plus	Percent of Hospitals in Cohort Area that are Enrolled
Cohort 1	39	18%	87%	91%
Cohort 2	50	23%	90%	96%
Cohort 3	42	19%	74%	100%
Cohort 4	43	20%	84%	100%
Cohort 5	45	21%	78%	100%

Appendix C. TexasAIM Plus OBH Learning Collaborative Faculty

Table C-1. TexasAIM Plus OBH Learning Collaborative Faculty

Catherine "Carey" Eppes, MD, MPH, TexasAIM Plus Faculty Chair
Linda H. Beaverstock, BSN, RNC-OB, C-EFM
Carlos Carreno, MD
Rakhi Dimino, MD, MMM, FACOG
Kendra Folh, BSN, RNC-OB, CPHQ
Karin Fox, MD, M.Ed.
Patricia Heale, DNP, RNC-OB, C-EFM
Renee' Jones, DNP, RNC-OB, WHNP-BC
Suzanne Lundeen, PhD, RNC-OB, NEA-BC
Jamie Morgan, MD
Carroll Whittaker, MSN, RNC-OB, C-EFM

Appendix D. TexasAIM Obstetric Care & COVID-19

Table D-1. TexasAIM Obstetric Care & COVID-19 Webinars

Date	Topic	Attendees	Total Views (Live and Recorded)
3/20/2020	General Information/Simulation	291	497
3/27/2020	Anemia Protocols/ Transport/ Rural Hospitals	278	331
4/03/2020	Staff Wellness/Outpatient Care	256	311
4/10/2020	Neonatal Care/Simulation	220	286
4/17/2020	COVID-19 Q&A Panel	259	318
4/24/2020	Anesthesia/Critical Care	212	275
5/01/2020	Surge Planning	180	221
5/08/2020	Case Studies and Lessons Learned	187	224
5/15/2020	COVID-19 Q&A Panel	167	188
5/29/2020	Rural Hospitals Response to COVID-19	139	161
6/12/2020	Strategies for Reopening	115	141
9/04/2020	Disparities and COVID-19	96	108

Appendix E. TexasAIM Obstetric Hemorrhage Measures

Figure E-1. Alliance for Innovation on Maternal Health (AIM) Data Types

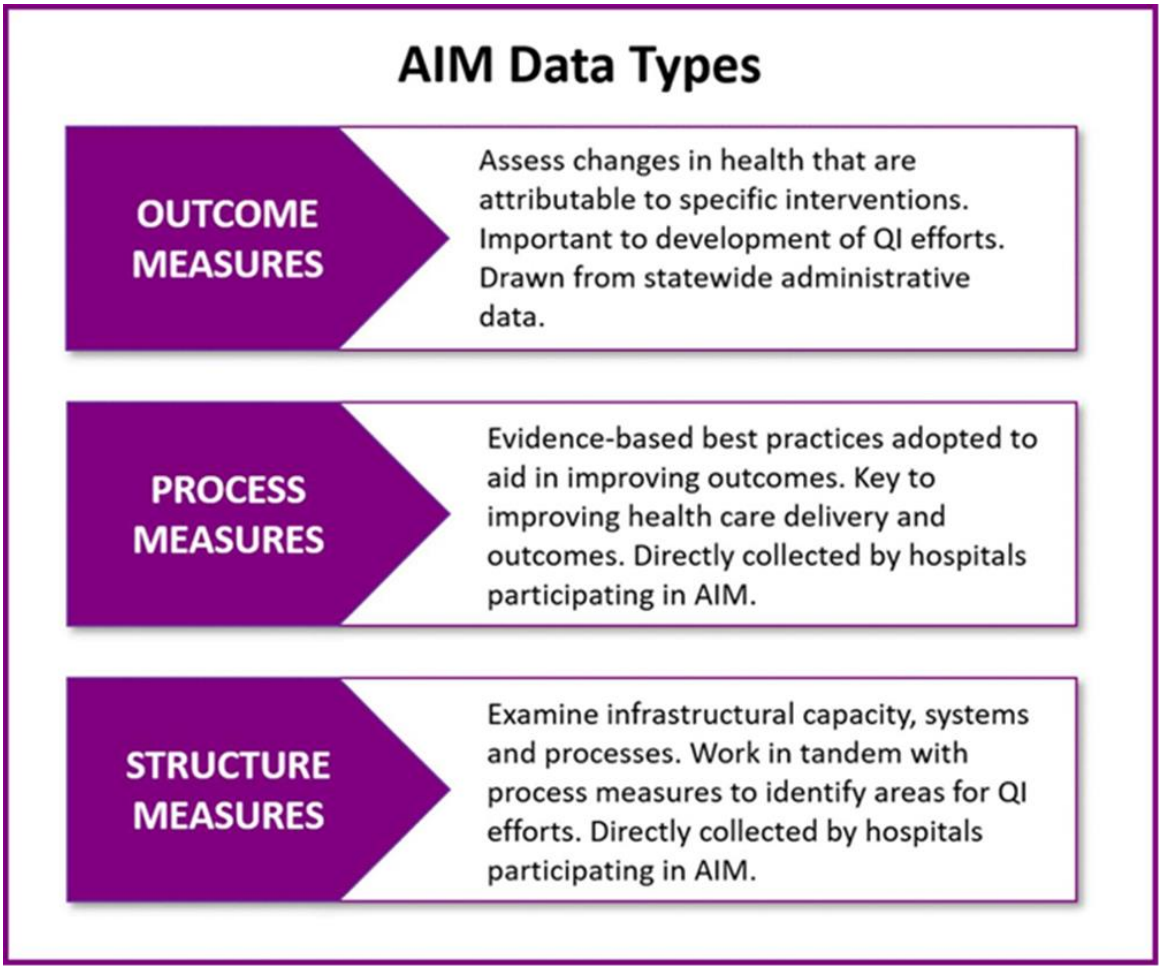


Table E-1. Obstetric (OB) Hemorrhage Measures Used in TexasAIM

Measure	Description
AIM OBH Structure 1: Patient, Family & Staff Support	Has your hospital developed OB specific resources and protocols to support patients, family, and staff through major OB complications?
AIM OBH Structure 2: Debriefs	Has your hospital established a system to preform regular formal debriefs after cases with major complications?

Measure	Description
AIM OBH Structure 3: Multidisciplinary Case Reviews	Has your hospital established a process to perform multidisciplinary systems-level review on all cases of severe maternal morbidity?
AIM OBH Structure 4: Hemorrhage Cart	Does your hospital have OB hemorrhage supplies readily available, typically in a cart of mobile box?
AIM OBH Structure 5: Unit Policy and Procedure	Does your hospital have an OB hemorrhage policy and procedure that provides a unit-standard approach using a stage-based management plan with checklists?
AIM OBH Structure 6: EHR Integration	Were some of the recommended OB hemorrhage Bundle processes integrated into your hospital EMR system?
AIM OBH Process 1: Unit Drills	P1a: How many OB drills were performed on your unit for any maternal safety topic? P1b: What were covered in the OB drills?
AIM OBH Process 2: Provider Education	P2a: What cumulative proportion of OB physicians and midwives has completed an education program on OB Hemorrhage? P2b: What cumulative proportion of OB physicians and midwives has completed an education program on OB Hemorrhage Bundle elements and the unit-standard protocol?
AIM OBH Process 3: Nursing Education	P3a: What cumulative proportion of OB nurses had completed an education program on OB Hemorrhage? P3b: What cumulative proportion of OB nurses has completed an education program on OB hemorrhage Bundle elements and the unit-standard protocol?
AIM OBH Process 4: Risk Assessment	What cumulative proportion of mothers had a hemorrhage risk assessment with risk level assigned, performed at least once between admission and birth and shared among the team?
AIM OBH Process 5: Quantified Blood Loss	What proportion of mothers had measurement of blood loss from birth through the recovery period using quantitative and cumulative techniques?

Measure	Description
AIM OBH Outcome 1: Severe Maternal Morbidity*	Denominator: All mothers during their birth admission, excluding ectopic pregnancies and miscarriages Numerator: Among the denominator, all cases with any Severe Maternal Morbidity (SMM) code
AIM OBH Outcome 2: Severe Maternal Morbidity (excluding cases with only a transfusion code) among All Delivering Women*	Denominator: All mothers during their birth admission, excluding ectopic pregnancies and miscarriages Numerator: Among the denominator, all cases with any non-transfusion (SMM) code
AIM OBH Outcome 3: Severe Maternal Morbidity among Hemorrhage Cases*	Denominator: All mothers during their birth admission, excluding ectopic pregnancies and miscarriages, meeting one of the following criteria: • Presence of an Abruption, Previa or Antepartum hemorrhage diagnosis code • Presence of transfusion procedure code without a sickle cell crisis diagnosis code • Presence of a Postpartum hemorrhage diagnosis code Numerator: Among the denominator, all cases with any (SMM) code
AIM OBH Outcome 4: Severe Maternal Morbidity (excluding cases with only a transfusion code) among Hemorrhage Cases*	Denominator: All mothers during their birth admission, excluding ectopic pregnancies and miscarriages, meeting one of the following criteria: • Presence of an Abruption, Previa or Antepartum hemorrhage diagnosis code • Presence of transfusion procedure code without a sickle cell crisis diagnosis code • Presence of a Postpartum hemorrhage diagnosis code Numerator: Among the denominator, all cases with any non-transfusion (SMM) code

Measure	Description
TexasAIM Plus THA OBH Process Improvement (PI) Measure 1	Percent of patients with a documented risk assessment for maternal hemorrhage completed on admission for the birth hospitalization
TexasAIM Plus THA PI Measure 2	Frequency of multi-disciplinary debrief sessions completed for obstetric hemorrhage of greater than 1,000 mL blood loss
TexasAIM Plus THA OBH PI Measure 3	Frequency of appropriate escalation initiated in response to maternal early warning signs
TexasAIM Plus THA OBH PI Measure 4	Frequency of documented multi-disciplinary review for patients admitted for a birth hospitalization who meet hospital's review criteria for screening for severe maternal morbidity
TexasAIM Plus THA OBH PI Measure 5	Rate of patients admitted for a birth hospitalization who receive transfusion of 4 or more units of Packed Red Blood Cells throughout the hospital stay

*DSHS reports outcome data into the AIM National Data Center portal using the Texas Hospital Inpatient Discharge Data File

Percent increase is the amount of increase in the percent of hospitals reporting a measure was in place from baseline to the most recently reported data. For structure measures (Table D-2), the baseline percentage was the percent of hospitals that reported a measure was in place by or before June 2018. At the time of this report, structure measures were most recently reported in August 2020. For process measures (Figures D-2 through D-7), which are reported quarterly, the baseline percentage was the percent of hospital reporting that the measure was in place for 90 percent or more of births during July-September 2018. The most recently reported data was either January-March 2020 or April-June 2020, depending on the hospital. Rate of reporting since March 2020 has been impacted by hospitals' capacity during their response to COVID-19.

TexasAIM Plus OBH LC Participant Structure Measures

Evidence of improved structures and processes for readiness, recognition and prevention, response, and reporting and systems learning for obstetric hemorrhage events.

Table E-2. TexasAIM Plus Learning Collaborative (LC) Structure Measures Reported to be in Place at Baseline and by August 2020 (percent and percent increase (improvement))

AIM OBH Structure Measure	In place at Baseline Pre-TexasAIM June 2018 (%)	In place by August 2020 (%)	Percent Increase/ Improvement (%)
Structure 1: Patient, Family & Staff Support-Hospital has developed OB specific resources and protocols to support patients, family and staff through major OB complications	21.1%	66.7%	216%
Structure 2: Debriefs-Hospital has established a system in your hospital to perform regular formal debriefs after cases with major complications	32.5%	95.6%	194%
Structure 3: Multidisciplinary Case Reviews-Hospital has established a process to perform multidisciplinary systems-level reviews on all cases of severe maternal morbidity (including women admitted to the ICU, receiving ≥4 units RBC transfusions, or diagnosed with a VTE	34.2%	95.6%	180%

AIM OBH Structure Measure	In place at Baseline Pre-TexasAIM June 2018 (%)	In place by August 2020 (%)	Percent Increase/ Improvement (%)
Structure 4: Hemorrhage Cart-Hospital has OB hemorrhage supplies readily available, typically in a cart or mobile box	69.3%	100%	50%
Structure 5: Unit Policy and Procedure-Hospital has an OB hemorrhage policy and procedure (reviewed and updated in the last 2-3 years) that provides a unit-standard approach using a stage-based management plan with checklists	36.8%	93.0%	153%
Structure 6: EHR Integration-Some of the recommended OB Hemorrhage Bundle processes (i.e. order sets, tracking tools) are integrated into hospital's Electronic Health Record system	36.0%	93.9%	161%

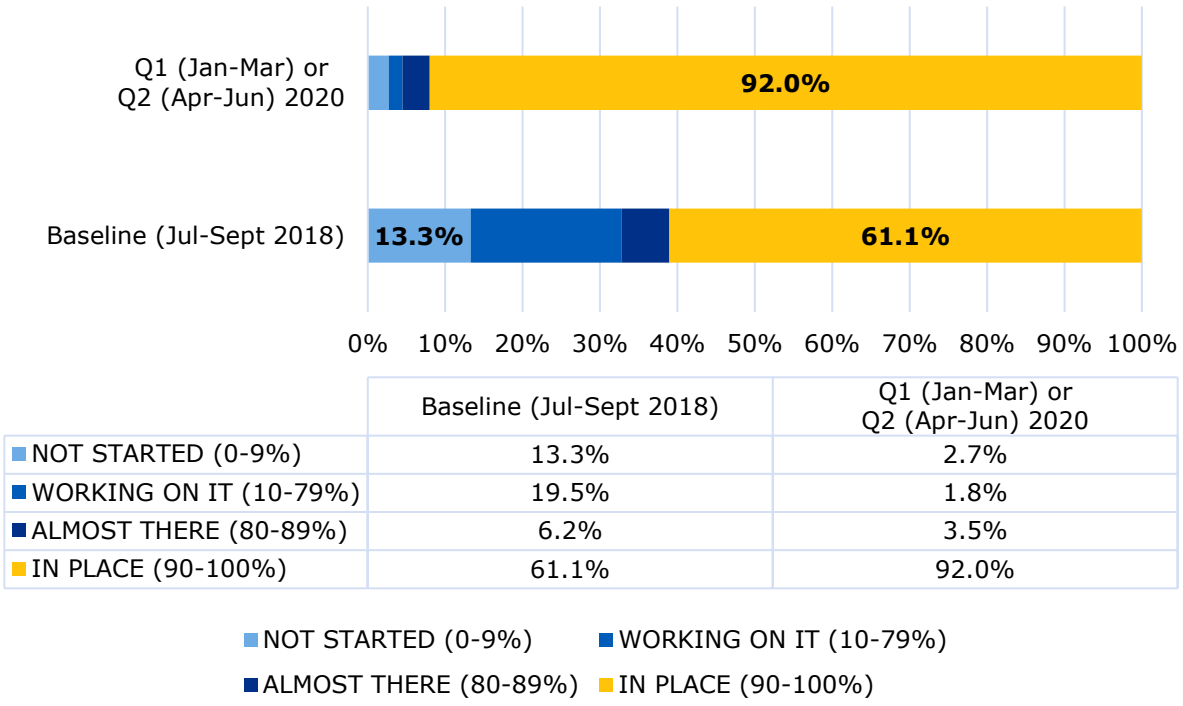
PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS).

DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 that accessed the portal to report on process measures for both Baseline (July-September 2018) and AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2 and reported completion status (in place; not in place) for one or more structure measures. **N=114.**

TexasAIM Plus OBH LC Participant Process Measures

Figure E-2. AIM OBH Process Measure 3a. Nursing Education-Hemorrhage: At the end of this quarter, what cumulative proportion of OB nurses has completed (within the last 2 years) an education program on Obstetric Hemorrhage?[19]

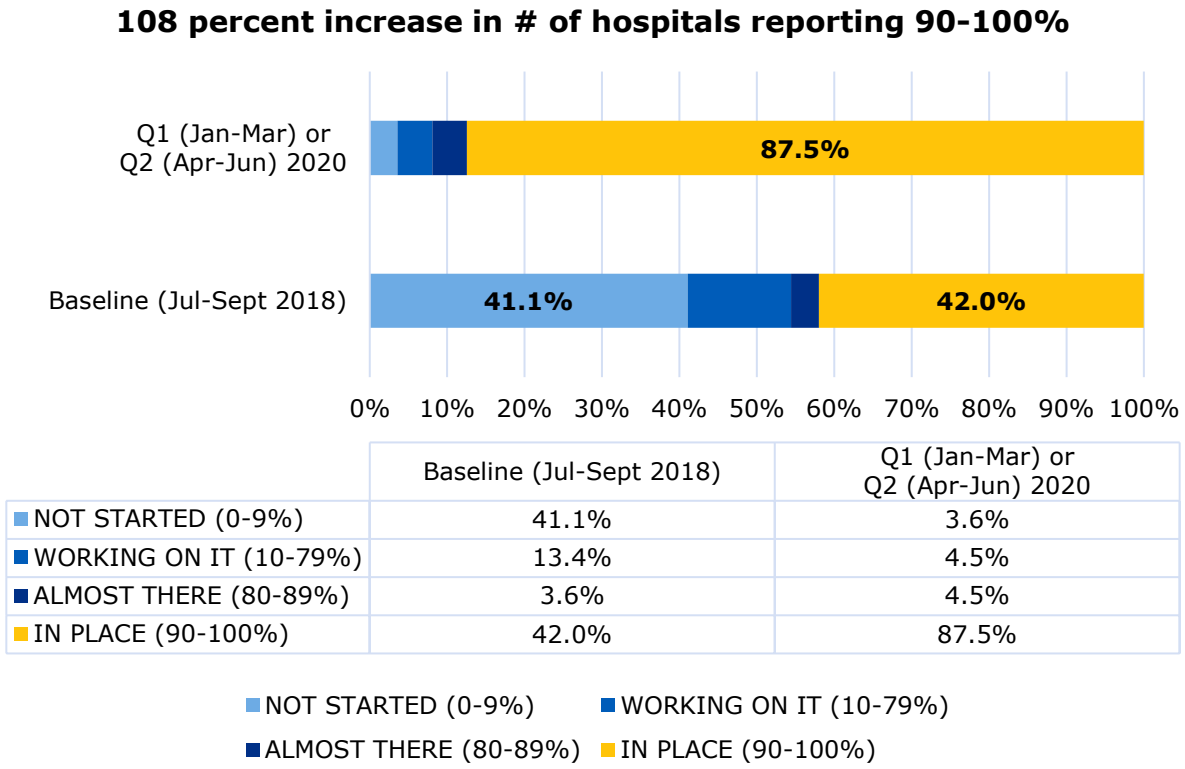


	Baseline (Jul-Sept 2018)	Q1 (Jan-Mar) or Q2 (Apr-Jun) 2020
NOT STARTED (0-9%)	13.3%	2.7%
WORKING ON IT (10-79%)	19.5%	1.8%
ALMOST THERE (80-89%)	6.2%	3.5%
IN PLACE (90-100%)	61.1%	92.0%

[19] PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS). DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas.

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 and reporting on measure for both Baseline (July-September 2018) AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2, April-June 2020 (Q2). Q2 data used where available; Q1 data used if Q2 data not reported. **N=113.**

Figure E-3. AIM OBH Process Measure 3b. Nursing Education-Protocol: At the end of this quarter, what cumulative proportion of OB nurses has completed (within the last 2 years) an education program on the Obstetric Hemorrhage Bundle elements and the unit-standard protocol[20]

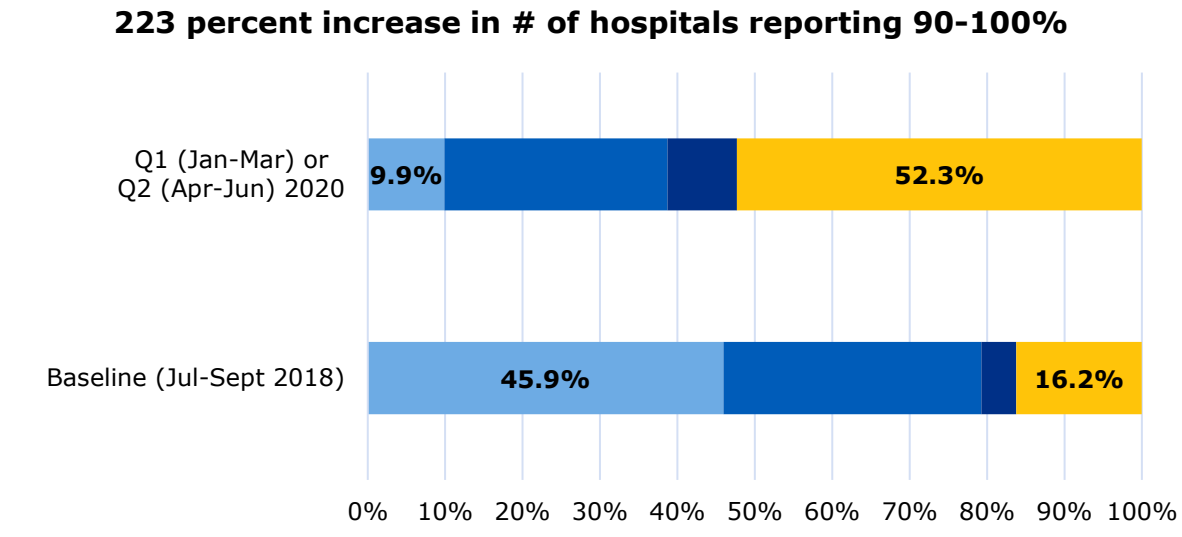


	Baseline (Jul-Sept 2018)	Q1 (Jan-Mar) or Q2 (Apr-Jun) 2020
NOT STARTED (0-9%)	41.1%	3.6%
WORKING ON IT (10-79%)	13.4%	4.5%
ALMOST THERE (80-89%)	3.6%	4.5%
IN PLACE (90-100%)	42.0%	87.5%

[20] PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS). DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas.

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 and reporting on measure for both Baseline (July-September 2018) AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2, April-June 2020 (Q2). Q2 data used where available; Q1 data used if Q2 data not reported. **N=112.**

Figure E-4. AIM OBH Process Measure 2a. Provider Education-Hemorrhage: At the end of this quarter, what cumulative proportion of OB physicians and midwives has completed (within the last 2 years) an education program on Obstetric Hemorrhage?[21]

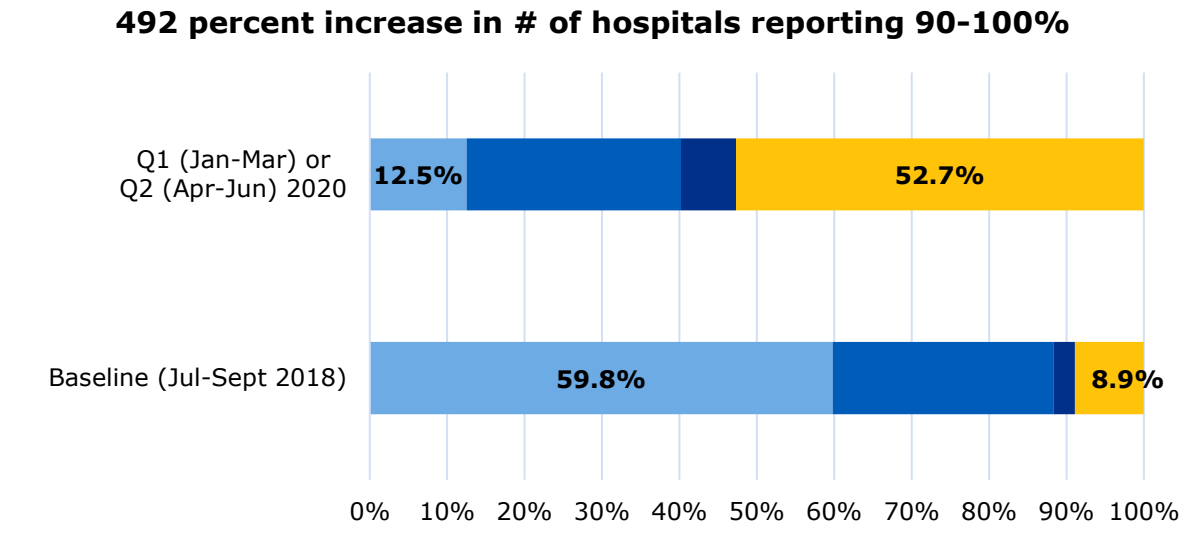


	Baseline (Jul-Sept 2018)	Q1 (Jan-Mar) or Q2 (Apr-Jun) 2020
NOT STARTED (0-9%)	45.9%	9.9%
WORKING ON IT (10-79%)	33.3%	28.8%
ALMOST THERE (80-89%)	4.5%	9.0%
IN PLACE (90-100%)	16.2%	52.3%

[21] PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS). DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas.

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 and reporting on measure for both Baseline (July-September 2018) AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2, April-June 2020 (Q2). Q2 data used where available; Q1 data used if Q2 data not reported. **N=111.**

Figure E-5. AIM OBH Process Measure 2b. Provider Education-Protocol: At the end of this quarter, what cumulative proportion of OB physicians and midwives has completed (within the last 2 years) an education program on the Obstetric Hemorrhage Bundle elements and the unit-standard protocol?[22]

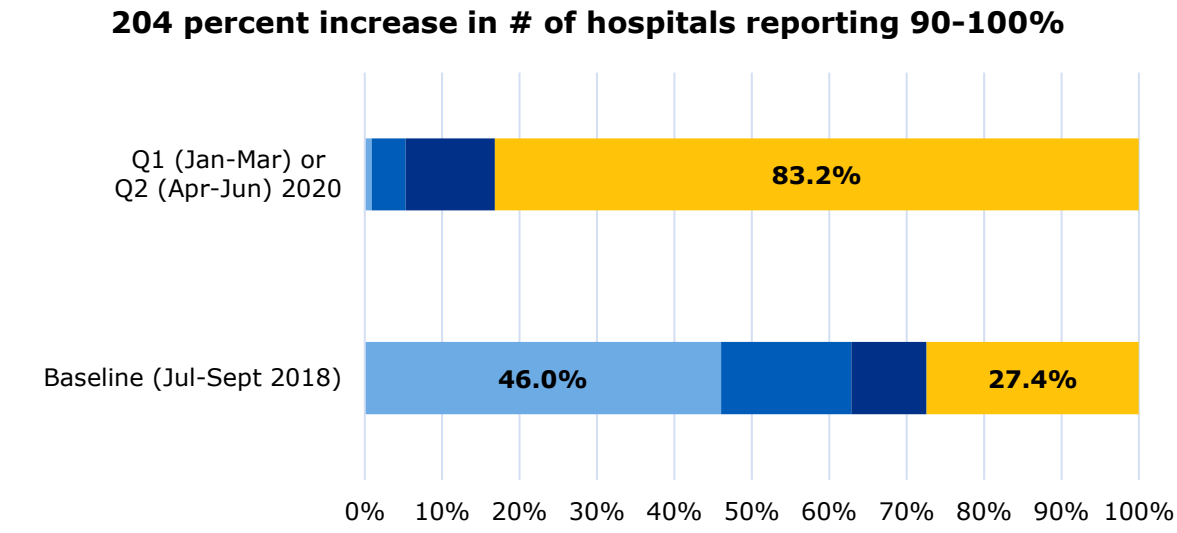


	Baseline (Jul-Sept 2018)	Q1 (Jan-Mar) or Q2 (Apr-Jun) 2020
NOT STARTED (0-9%)	59.8%	12.5%
WORKING ON IT (10-79%)	28.6%	27.7%
ALMOST THERE (80-89%)	2.7%	7.1%
IN PLACE (90-100%)	8.9%	52.7%

[22] PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS). DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas.

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 and reporting on measure for both Baseline (July-September 2018) AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2, April-June 2020 (Q2). Q2 data used where available; Q1 data used if Q2 data not reported. **N=112.**

Figure E-6. AIM OBH Process Measure 4. Risk Assessment: At the end of this quarter, what cumulative proportion of mothers had a hemorrhage risk assessment with risk level assigned, performed at least once between admission and birth and shared among the team?[23]

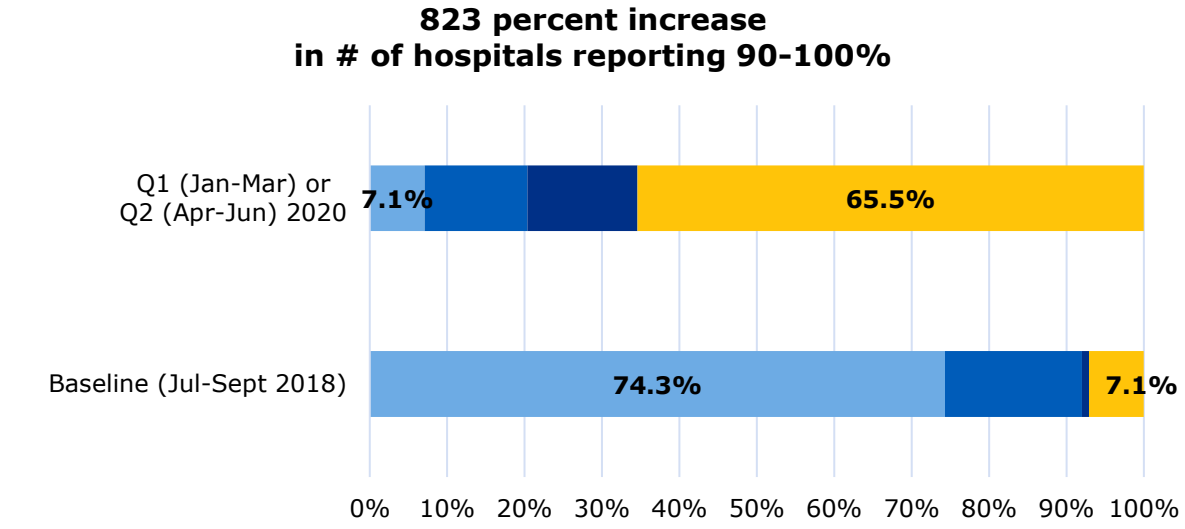


	Baseline (Jul-Sept 2018)	Q1 (Jan-Mar) or Q2 (Apr-Jun) 2020
NOT STARTED (0-9%)	46.0%	0.9%
WORKING ON IT (10-79%)	16.8%	4.4%
ALMOST THERE (80-89%)	9.7%	11.5%
IN PLACE (90-100%)	27.4%	83.2%

[23] PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS). DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas.

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 and reporting on measure for both Baseline (July-September 2018) AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2, April-June 2020 (Q2). Q2 data used where available; Q1 data used if Q2 data not reported. **N=113**.

Figure E-7. AIM OBH Process Measure 5. In this quarter, what proportion of mothers had measurement of blood loss from birth through the recovery period using quantitative and cumulative techniques?[24]



	Baseline (Jul-Sept 2018)	Q1 (Jan-Mar) or Q2 (Apr-Jun) 2020
NOT STARTED (0-9%)	74.3%	7.1%
WORKING ON IT (10-79%)	17.7%	13.3%
ALMOST THERE (80-89%)	0.9%	14.2%
IN PLACE (90-100%)	7.1%	65.5%

[24] PREPARED BY: Maternal & Child Health Epidemiology, Division for Community Health Improvement, the Department of State Health Services (DSHS). DATA SOURCE: AIM National Data Center Obstetric Hemorrhage Portal, Texas.

NOTES: Limited to hospitals enrolled in the TexasAIM Plus Obstetric Hemorrhage Learning Collaborative by or before November 2018 and reporting on measure for both Baseline (July-September 2018) AIM Calendar Year 2020 Quarter 1, January-March 2020 (Q1) and/or AIM Calendar Year 2020 Quarter 2, April-June 2020 (Q2). Q2 data used where available; Q1 data used if Q2 data not reported. **N=113.**

TexasAIM Plus OBH LC Participant Outcome Measures

DSHS determined the percentage rate of Severe Maternal Morbidity among Hemorrhage Cases Morbidity (excluding cases with only a transfusion code) across all hospitals enrolled in TexasAIM Basic or Plus OBH Program. To compare rates of SMM among hemorrhage cases during the TexasAIM Plus OBH Learning Collaborative "period of intervention" and prior to the launch of the Learning Collaborative (baseline) the rate of change between these periods was also calculated.

A "pre-TexasAIM" baseline rate of Severe Maternal Morbidity among Hemorrhage Cases Morbidity (excluding cases with only a transfusion code) was calculated using data for OBH delivery hospitalizations with discharge dates occurring from January 2016 through December 2017. A preliminary "period of intervention" Severe Maternal Morbidity among Hemorrhage Cases Morbidity (excluding cases with only a transfusion code) rate was calculated using data for OBH delivery hospitalizations with discharge dates occurring from October 2018 and through December 2019. The full "period of intervention" of the TexasAIM Plus OBH Learning Collaborative began with the first learning session cohort meetings in November and December 2018 and will continue through the end of December 2020. Data are not yet available for 2020.

Hospitals enrolled in TexasAIM by or before October 1, 2020, excluding those hospitals that had enrolled but subsequently closed their Obstetric service lines show a 14 percent decrease in the rate of *Severe Maternal Morbidity among Hemorrhage Cases Morbidity* between the intervention period and baseline.[25]

[25] The "period of intervention" is the period of collaborative learning, or from the date of the first Learning Session (LS) through the end of Action Period 3 (see Appendix D). LSs 1 for TexasAIM Plus Obstetric Hemorrhage Learning Collaborative Cohorts 1-5 were held in the months of November through December 2018. This corresponds with the Calendar Year 2018 reporting Quarter 4 (October-December 2018). While only TexasAIM Plus improvement teams received the Collaborative Learning intervention, data for all hospitals enrolled in TexasAIM Basic or Plus are included in the calculations for these rates.

Appendix F. "Early Adopter" Hospitals Implementing OB-OUD Bundle

- Baptist Medical Center
- Corpus Christi Medical Center
- Harris Health Ben Taub Hospital
- John Peter Smith Hospital
- Memorial Hermann - Greater Heights
- Parkland Hospital
- St. David's North Austin
- Seton Medical Center
- Shannon Medical Center
- University Hospital-University Health System, San Antonio

Figure F-1. Map of Pilot "Early Adopter" Hospitals Implementing Components of the AIM Obstetric Care for Women with Opioid Use Disorder Bundle