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Evaluating Risk-Appropriate Perinatal Care in Nevada

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EVALUATING RISK-APPROPRIATE PERINATAL CARE IN NEVADA

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Abstract

In the United States, (U.S.) technological advancement and increased accessibility to health care resources have not deterred the increasing maternal morbidity and mortality rates (CDC, 2022). In 2019, 754 maternal deaths were reported; in 2020, 861 deaths were reported. In a span of one year, the maternal mortality rate increased by 14% (CDC,2022). American Indian/Alaska Native and Black birthing people are 2 to 3 times more likely to die from a pregnancy-related cause than White birthing people (CDC, 2019). 80% percent of all pregnancy-related deaths can be prevented (CDC, 2022). Risk-appropriate care is a strategy used to improve perinatal care. Delivery of risk-appropriate care is dependent on a maternity hospital or birthing facility's availability of technology, equipment, and staffing capable of providing the appropriate care based on the patients' medical risks (Ryan, 1976). Currently, risk-appropriate care has not been assessed in maternity hospitals and birthing facilities in the State of Nevada. This project served to assess the level of risk-appropriate care through the implementation of the CDC Levels of Care Assessment (LOCATe) tool.

Keywords: risk-appropriate care, CDC LOCATe Tool, Levels of Care, perinatal regionalization

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Dedication

This project is dedicated to my children, Alexandra, Isaiah, Jonah, and Jacob. It is an honor that you call me mom. To my husband, Michael Guerrica; thanks for being my navigator, my photographer, and my DJ on this adventure we call life. Finally, I dedicate this project to the patients that have trusted me in their care. The work I do is because of their inspirational stories, their resilience, and for the differences they make in my life.

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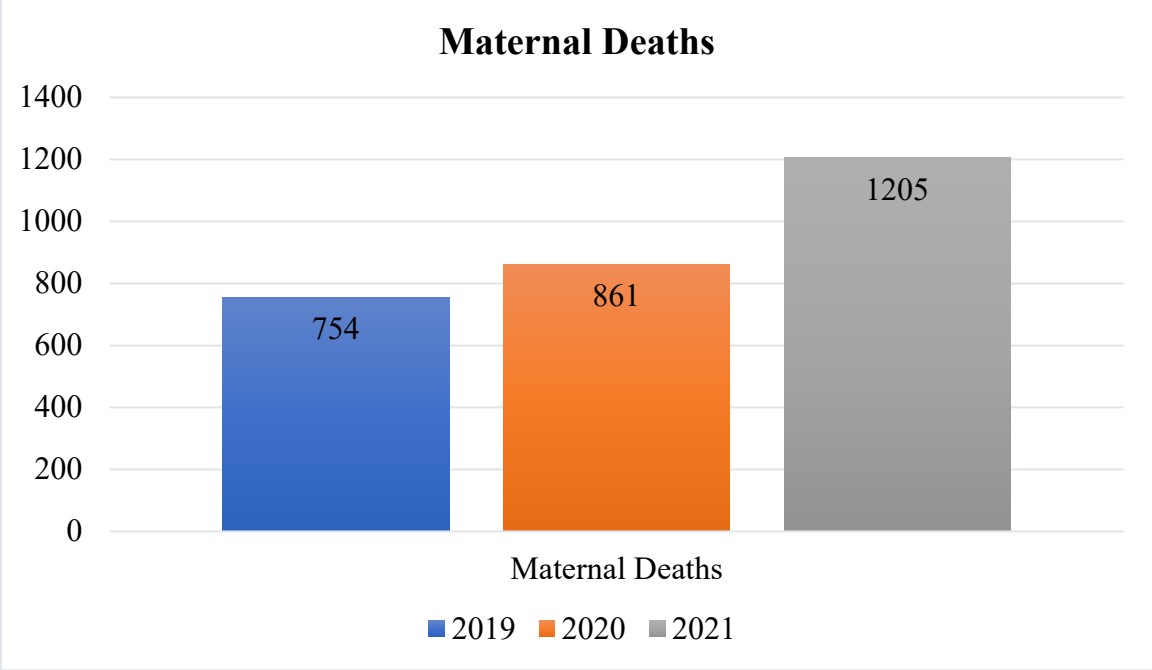
Chapter I

Introduction

Despite technological advancements and availability of resources, maternal morbidity, and mortality rates in the United States (U.S.) are increasing (Centers for Disease Control [CDC], 2023). In 2019, 754 maternal deaths were reported, in 2020, 861 deaths were reported, and most recently, in 2021, 1,205 deaths were reported. From 2020 to 2021, the maternal mortality rate increased by 16% and from 2019 to 2021, the maternal mortality rate increased by 23% (See Figure 1, CDC, 2023). American Indian/Alaska Native and Black birthing people are 2 to 3 times more likely to die from a pregnancy related cause than White birthing people (CDC, 2019). Over 80% of all pregnancy related deaths can be prevented (CDC, 2022).

Figure 1: Maternal Deaths 2019-2021



U.S. states and national territories, health departments, professional organizations, hospital systems, and maternity health providers have made ongoing efforts to reduce maternal mortality. Several strategies to improve perinatal care have been researched, implemented, and utilized with ongoing success. Some of these efforts include the creation of state Perinatal Quality Collaboratives (PQCs), Maternal Morbidity and Mortality review committees, maternal health and safety bundles standardizing care delivery, and hospital transport protocols (King et al., 2020). Perinatal regionalization and risk-appropriate care are long standing strategies aimed at decreasing perinatal morbidity and mortality rates. Risk-appropriate care is a strategy used to ensure that patients at high-risk receive care in a facility well-equipped and staffed to provide the most appropriate care based on the patient's needs. Perinatal regionalization is the referral of high-risk pregnant people or infants to a regional facility equipped to provide the most appropriate care (Ryan, 1976).

The state of Nevada has emerged as a conundrum to the public discourse regarding maternal care. Currently, levels of neonatal care are formally identified to provide care to high-risk neonates. However, identification of medical facilities capable of caring for high-risk birthing people experiencing high risk medical needs has yet to be formalized. This proposed DNP project intended to investigate risk-appropriate care of birthing people in Nevada through the implementation of the Centers for Disease Control (CDC) Levels of Care Assessment (LOCATe) Tool.

Discussion of Phenomena of Interest

In the 1930s, births occurred more frequently in the hospital setting increasing the use of routine medicalized interventions (Hall, 2019). Although promotion of hospital-based birth was intended to improve birth outcomes, perinatal morbidity and mortality rates were higher than

anticipated and a significant need to address the issue was identified. In 1976, the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP), along with the March of Dimes, collaboratively produced the publication Toward Improving the Outcome of Pregnancy (TIOP) (Ryan, 1976). Through collaborative efforts, the concepts of perinatal regionalization with designations of levels of care and identified risk-appropriate care as a strategy to improve maternal and neonatal care outcomes were introduced. TIOP is the foundational guideline for the current American Academy of Pediatrics (AAP) Levels of Neonatal Care policy statement and the American College of Obstetrics and Gynecology (ACOG) and Society of Maternal Fetal Medicine (SMFM), Levels of Maternal Care Consensus statement.

Risk-appropriate care delivery is dependent on a maternity hospital or birthing facility's availability of technology, equipment, and staffing capable of providing the appropriate care based on the patients' medical risks (Ryan, 1976). Perinatal regionalization classifies facilities into four categories or levels of care based on the availability of services, personnel, and medical equipment within the facility. Level I designated facilities provide care and services for uncomplicated maternity patients; level II facilities provide care for complicated, high-risk maternity care patients; level III facilities provide services for complete maternity and neonatal intensive care services; and level IV facilities are identified as regional care facilities, where high-risk people can receive the highest level of care for an unexpected or highly anticipated obstetrical event. The higher levels of care incorporate and build from the capabilities of the lower levels of care (Obstetric Care Consensus, 2019). Although the designation of levels of care are similar, neonatal, and maternal levels of care may be different within the same facility (Obstetric Care Consensus, 2019).

Through perinatal regionalization and risk-appropriate care, improved neonatal outcomes demonstrated the significance of standardized definitions and care services provided at appropriate facilities with corresponding levels of neonatal care (Barfield, et al., 2012). Regionalization of neonatal care has been proven to improve neonatal morbidity and mortality rates, as such regionalization of maternity care is a viable strategy capable of decreasing maternal morbidity and mortality (Handley, 2022). Currently, levels of care categories are assigned to neonatal units with some states now recognizing maternal levels of care based on the risk-appropriate care provided (Vladutiu, et al., 2020). Nevada does not currently recognize maternal levels of care.

The Maternal Levels of Care Obstetrical Care Consensus, like the Neonatal Levels of Care guideline, establishes levels of care based on the availability of personnel, medical equipment, and specialty service availability on-site. However, designated maternal levels of care are separate from neonatal levels of care and can be completely different in the same facility. For example, a birthing person with a history of severe cardiovascular disease at 37 weeks gestation with an uncomplicated pregnancy can give birth in a facility with a Level I nursery. However, the most appropriate facility to render care for the birthing person should have cardiac intensive care services immediately available for possible emergent maternal cardiac care complications. The Levels of Maternal Care guideline also emphasizes standardized definitions and guidelines for improving care and recommends high-risk patients obtain risk-appropriate care at the appropriate facilities as demonstrated in the given example (Obstetric Care Consensus, 2019).

Problem and Significance

In Nevada, hospitals with neonatal intensive care units (NICUs) are formally identified by the level of care provided through certification, licensing, and credentialing through the state. Despite an established process to designate NICU levels of care, the process to implement the assessment of maternal levels of care provided in maternity hospitals and birthing facilities throughout the state has not yet been pursued. Birthing people with high-risk pregnancies and comorbidities would benefit from care in medical centers adequately equipped to manage their care (Easter, 2019).

Purpose

The purposes of this DNP project included:

1. Implementation of the CDC LOCATe Tool in all Nevada maternity hospitals and birthing facilities.
2. Evaluation of facility participants' self-reported levels of care compared to the CDC LOCATe assessed level of care.
3. Identification of the current rate of risk-appropriate care delivered in Nevada maternity hospitals and birthing facilities.

Chapter II

Review of the Literature

Risk-appropriate Care

Risk-appropriate care is a strategy used to ensure high-risk birthing people and neonates receive care in a maternity hospital or birthing facility well equipped and appropriately staffed to meet their critical care needs. The second component of risk-appropriate care entails nurses and health care providers identifying and referring a high-risk birthing person or neonate to a regional facility with the capacity to provide appropriate critical care services if critical care services are unavailable at that facility (Barnea, et al., 2021; DeSisto, et al.; 2020; Handley, et al., 2021, Kroelinger & Okoroh, et al., 2019; Kroelinger, et. al, 2021; Kunz, et al, 2020, Madni, 2021; Schlichting, et. al, 2020, Van Otterloo, & Connelly, 2018).

Risk-appropriate care is synonymous with levels of care. According to the AAP Levels of Neonatal Care and the ACOG/SMFM Maternal Levels of Care guidelines, levels of care are assigned based on the maternity hospital or birthing facilities' capacity to provide risk-appropriate care (Obstetric Consensus 2019, AAP, 2012). Levels of risk-appropriate care were first defined and established for high-risk neonates (Ryan, 1976). In the state of Nevada, NICU levels of care are formally identified. Maternal levels of risk-appropriate care have yet to be formally assessed or identified in the State of Nevada.

Perinatal Regionalization

Perinatal regionalization or regionalized systems of perinatal care was first described in 1976 in the ACOG, SMFM, AAP, and March of Dimes collaborative publication, Towards Improving Outcomes in Pregnancy (Ryan, 1976). Regionalization of perinatal care is a system approach to improving perinatal care by directing, coordinating, and referring care of high-risk

patients to the appropriate maternity hospitals or birthing facilities within a geographic region. To be deemed appropriate, these facilities should be capable of providing risk-appropriate care. Historically, perinatal regionalization was introduced in the U.S. in the 1980s and with the purpose of improving neonatal outcomes and decreasing the incidence of morbidity and mortality. Over the years, perinatal regionalization has been shown to improve outcome for very low birth weight infants (Bronstein, et al. 2019; Bizzarro, 2019).

Currently, perinatal regionalization and risk-appropriate maternal levels of care have not been formally identified in the state of Nevada. The CDC LOCATe Tool is used to assess the level of maternal care provided in maternity hospitals and birthing facilities. The tool is best completed by hospital leadership or personnel most familiar with staffing, availability of medical equipment, and specialty care available within their facility. (Madni, 2021; Schlichting, et al., 2020).

CDC LOCATe Tool

The CDC Levels of Care Assessment Tool was developed by the CDC, to assess health care facilities providing perinatal services (CDC, 2022). The goal of the CDC LOCATe Tool is to provide a high-level standardized assessment of both neonatal and maternal levels of care (CDC,2022). While not comprehensive in assessing all aspects of clinical guidance, results from the CDC LOCATe Tool can be used to engage stakeholders and create necessary changes to improve overall perinatal health (Catalano, et. al, 2017, CDC, 2019, Easter, 2019, Kroelinger & Goodman, 2020, Srinivas, et al., 2019, Vladutiu, et. al, 2020). Utilization of the results of completed CDC LOCATe Tools is also beneficial in promoting interprofessional collaboration and coordination of care between regional areas (Catalano, et. al, 2017, Vladutiu, et. al 2020, Easter, et. al, 2019, Zahn, 2018). In identifying the levels of care of participating facilities, those

facilities performing at a higher level can help to be a resource for facilities that provide a lower level of care. The results of the CDC LOCATe Tool establish the level of risk-appropriate care provided by participating facilities, identifies knowledge gaps and opportunities to create or implement health care bundles and quality improvement measures. Limitations of the CDC LOCATe Tool include willingness of hospital staff to participate in the survey, responses to the tool are self-reported and respondents may overestimate the availability of medical equipment and staffing in the participating facility (Catalano, et al, 2017, Easter et. al, 2019, Zahn, et al, 2018).

Nursing Implications

Nurses employed in maternity hospitals and birthing facilities are at the bedside, providing direct care to the maternal-child dyad from admission to discharge. Nursing leaders and nurses working in maternity hospitals and birthing facilities have knowledge of the daily workflow involving patients, nursing staff, ancillary departments, and nursing units within their respective facilities. The CDC LOCATe Tool contains questions regarding availability of equipment, staffing, and other similar facility services. Completion of the CDC LOCATe Tool is a task best suited for individuals with an understanding of their facilities workflow and capabilities (CDC, 2022). Results from the CDC LOCATe Tool can help nursing leaders invoke change, create educational programs, and improve perinatal outcomes (Gillespie, et. al, 2021) and can also help legislators and other community leaders create opportunities or develop programs to improve perinatal care outcomes.

Needs Assessment

To identify the maternal levels of care in the state of Nevada, the CDC LOCATe Tool was implemented. The following needs assessments were identified.

Population Identified

The population of interest for this project included maternity hospitals and birthing facilities providing care to birthing people within the State of Nevada. In 2020, the population of people capable of giving birth, aged 15-44, was 613,820 (U.S. Census Bureau, 2022). The fertility rate in Nevada was 54.8 births per 1000 birthing people aged 15-44 years of age with a total of 33,653 births that occurred in 2020 (CDC, 2022).

There are 18 maternity hospitals and birthing facilities located in various regions throughout the state of Nevada, Table 1 (*see Appendix A*) and Table 2 (*see Appendix B*). Of the 18 facilities, 11 are located in the Southern Nevada region and 7 are located in the Northern Nevada region. Nevada hospitals provide services to a diverse demographic of patients. From 2018 through 2020 of all live births 37.6% were to birthing people identified as Hispanic, 36.7% were white, 14.1% were black, 0.9% were American Indian/Alaska Native, and 8.9% were Asian/Pacific Islander. Additionally, 4.7 % of live births were to birthing people under the age of 20, 50.3% were to birthing people ages 20-29, 41.4% were to birthing people ages 30-39 years old, and 3.6% were to birthing people ages 40 and older (Peristats, 2022). Of all the births in the state of Nevada between 2017 - 2018, 53,510 births were in Clark County in Southern Nevada and 10,553 were in Washoe County of Northern Nevada (Nevada Department of Health and Human Services, 2019).

Project Sponsor and Key Stakeholders.

This doctoral project was a requirement of the Doctor of Nursing Practice degree and was sponsored by the University Nevada Las Vegas, School of Nursing. Key stakeholders included:

- Patients that receive care in maternity hospitals or birthing facilities

- Hospital facility administrators and staff involved in the coordination of care and transport of patients requiring higher levels of care and in ability to recognize if their facility is not equipped to deliver risk-appropriate care.
- Owners of accredited birth centers because their birthing facility is classified as a risk-appropriate facility for patients that have little or no obstetrical or medical risks.
- Nevada Department of Public Health in their role for coordinating care in rural areas and implementing policy changes to improve community health and access to care.
- Insurance health plans because of their role in reimbursement of costs incurred from transport of patients to facilities capable of providing risk-appropriate care.
- Policy makers creating laws to improve quality of health and develop health care programs.
- Perinatal care providers (obstetricians, maternal fetal medicine specialists, midwives, women's health providers, neonatologists, pediatricians, family medicine providers) to identify patients that might need a higher level of care at birth due to high-risk comorbidities.
- Maternal nonprofit organizations, community birth advocates, Nevada Maternal and Child Health Advisory Board, Nevada Maternal Mortality Review Committee, and the Nevada Maternal, Child, and Adolescent Health Coalition (MCH) to help evaluate effectiveness and/or outcomes of births occurring in hospitals and ensuring appropriate level of care is received.

Organizational Assessment

This project was presented to the Nevada Maternal and Child Health Advisory Board in May of 2022. The Nevada Maternal Child Health Advisory Board is comprised of nine

multidisciplinary participants appointed by the State Board of Health and two nonvoting members of the Legislative Commission with one member from the Senate and one from the Assembly (DPBH, 2022). Members of the Nevada Maternal and Child Health Advisory Board verbalized interest in the implementation process and assisted with the provision of some contact information for hospital leaders throughout the state. During the May 2022 meeting, the CDC representative presented educational materials and answered questions regarding Levels of Maternal Care and implementation of the CDC LOCATe Tool to help assess risk-appropriate care. An update and follow up information regarding the implementation process was provided to the Nevada Maternal and Child Health Advisory Board at the August 2022 meeting.

All identified maternity hospitals and birthing facilities in the state were invited to participate in the implementation process. Contact information of hospital leadership was obtained. Communication was initiated and a solicitation to participate email was created and sent, Figure 2 (*see Appendix C*). Participants that completed the CDC LOCATe Tool provided self-assessment information through REDCap. After completion of the CDC LOCATe Tool, analysis of the data was completed by the CDC representative and a level of care was assigned to the participating facilities. The information from LOCATe was not intended for use as an official designation or verification of maternal level of care. However, facilities and participants may use the information obtained from the survey to request a formal assessment and survey to be conducted through the ACOG and The Joint Commission's Maternal Levels of Care Verification Program.

Assessment of Available Resources

A Memorandum of Understanding, Figure 3 *(see Appendix D)*, between the Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health

Promotion, Division of Reproductive Health and Board of Regents, Nevada System of Higher Education on behalf of the University of Nevada, Las Vegas was drafted and submitted by the DNP committee chair with resulting approval. The CDC provided technical assistance throughout the implementation process of the CDC LOCATe Tool. Data collected from the CDC LOCATe Tool was analyzed and the level of maternal and neonatal care was assigned to the participating facilities. The data was deidentified and participating facilities were provided with their facility information individually.

The Center for Health Information Analysis for Nevada (CHIA) is a research center at University of Nevada, Las Vegas. Researchers seeking information about utilization patterns, health status, and related issues can request and obtain reported data from hospital inpatient, outpatient, and ambulatory surgical centers (Nevada Division of Healthcare, Financing and Policy [DHCFP], n.d.). This project intended to use CHIA data for a post assessment analysis to examine the rate of risk-appropriate care and any relationship of risk-appropriate care and disparities in care.

Professional relationships with Obstetrical Medical Directors, members of professional organizations such as American College of Nurse Midwives Nevada Chapter and the Nevada Advanced Practice Nurses Association, and professional relationships with former colleagues in local facilities were utilized for outreach assistance in contacting key participants in hospitals in Nevada.

Team Selection and Formation

The DNP student under the mentorship of Dr. Jennifer Vanderlaan implemented the CDC LOCATe Tool. The DNP committee included Dr. Susan VanBeuge, Dr. Angela Silvestri-Elmore, Dr. James Alexander, and Dr. Jay Shen. Dr. Carla DeSisto, the CDC representative, was a key

participant and provided technical assistance throughout the implementation process. A statistician from CHIA was consulted and was asked to help conduct data analysis at the completion of the implementation of the CDC LOCATe Tool.

Committee

The committee for the proposed project was comprised of the DNP student, DNP project chair, and DNP project committee members. The DNP project committee included 2 members from the school of nursing, one member from the school of Public Health, and one member from the school of medicine who was also the Chief of Obstetrics and Gynecology. Additional participants of the committee included a statistician and CDC representative. Each member's proposed role was defined as:

- The DNP student, as the project lead, developed a project proposal by the end of the Spring 2019 semester; was identified as the LOCATe "champion" and coordinated communication and efforts made by participating facilities.
- The DNP project chair guided and acted as a mentor for the DNP student through the project proposal, attainment of Institutional Review Board (IRB) approval, and through completion of the project.
- The DNP committee reviewed the project proposal and attended the proposal defense.

Project Economic Analysis

Severe maternal morbidity is the result of unexpected or unintended life-threatening complications that occur with pregnancy or birth (CDC, 2021). Consequences of severe maternal morbidity can result in short term or long-term health issues and in some rare instances are linked to maternal death. For every 1 maternal death there are approximately 50-100 episodes of severe maternal morbidity (Ahn, et al., 2020). The cost of maternal morbidity and mortality

impact families both emotionally and financially. Severe maternal morbidity and mortality cost the U.S. tens of billions of dollars annually. The projected cost of maternal morbidity of all births from conception through age 5 is $32.3 billion (O, Neil, et al., 2021). In 2021, there was a total of 440 cases of severe maternal morbidity which translates to a rate of 204.8 cases per 100,000 births (Wenziger, C., 2022). The maternal mortality rate was 108.6 deaths per 100,000. The mortality rate in the U.S. overall is 23.8 deaths per 100,000 births (CDC, 2022).

Scope of Project

The scope of this project was to implement the CDC LOCATe Tool to identify the levels of maternal care provided in maternity hospitals and birthing facilities in Nevada and examine the current rate of risk-appropriate care. This project was not intended to provide a formal designation of maternal level of care.

Mission, Goals, and Objective Statements

Mission

The mission of this project was to improve access of risk-appropriate obstetrical care by identifying the maternal levels of care provided by maternity hospitals and birthing facilities in the state of Nevada by the end of 2023.

Goals and Objectives

Goal 1: By September 30, 2022, I contacted all key participants at each maternity hospital and birthing facility. This was demonstrated by email confirmation of participation and documented log in to the REDCap system. Email communication and initial log in to REDCap helped ensure that participants were properly enrolled and able to complete the CDC LOCATe Tool.

Objective 1: The first objective was to identify and contact key participants to educate and inform them about Maternal levels of care and request participation in responding to the CDC LOCATe Tool.

Goal 2: By December 2022, 100% of the facilities were anticipated to participate in the LOCATe implementation. Success of the goal would have been demonstrated by achieving a 100% response rate to the CDC LOCATe Tool. 100% participation and response rate would help accurately define the levels of maternal care provided in Nevada maternity hospitals and birthing facilities.

Objective 2: The second objective was to collect data from participants and prepare for data analysis of collected data.

Goal 3: By May of 2023, final data analysis of CDC LOCATe Tool responses should be completed, levels of maternal care, and risk-appropriate care received in Nevada should be reported. Success of this goal will be demonstrated by final submission of DNP project defense. The final report will be disseminated and shared with all key stakeholders to help create policy changes and improve overall maternal health in Nevada.

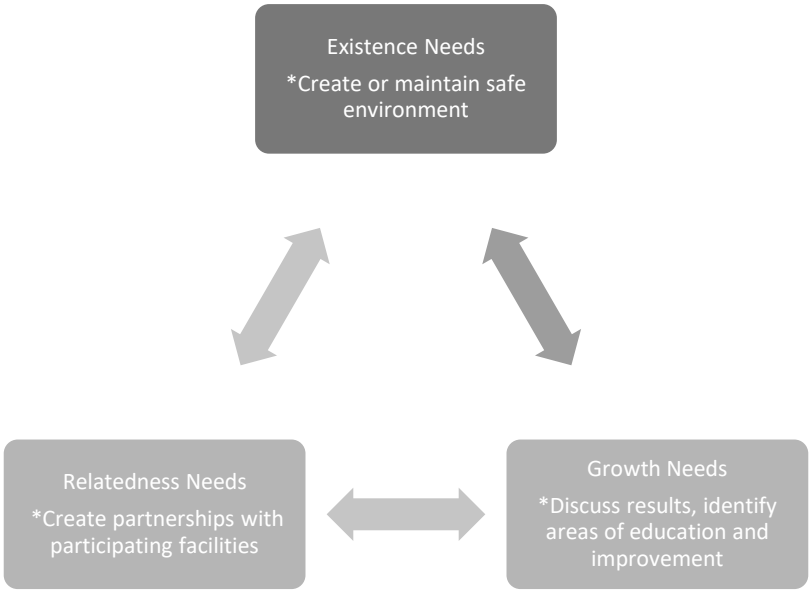
Objective 3: The third objective is to report the levels of maternal care and risk-appropriate care in maternity hospitals and birthing facilities in Nevada.

Chapter III

Theoretical Underpinnings

Alderfer's Existence, Relatedness, and Growth (ERG) theory was selected to support the theoretical framework for this project. Clayton Alderfer's ERG theory of motivation is an adaptation of Maslow's Hierarchy of Needs. Maslow's five sets of needs, physiological, safety, love, esteem, and self-actualization are consolidated into three core human needs categories in ERG theory (Alderfer, 1969). These categories include existence (E), relatedness (R), and growth (G). Maslow's safety, physiological, and material desires are recategorized into Alderfer's existence category; interpersonal processes including esteem needs that are derived from the response of others are fit into the relatedness category; and needs representing autonomous self-fulfilling activities are categorized in the growth needs category (Alderfer, 1969). In ERG theory, the concepts of desire and satisfaction attainment are synonymous with motivation. Unlike Maslow's Hierarchy of Needs, individuals can have needs in multiple categories simultaneously (See Figure 4: ERG Theory).

Figure 4: ERG Theory



Existence Needs

Creating a culture of patient safety remains a top priority for health care professionals and hospital administrators alike. During the recruitment stage of the project, stakeholders and potential participants will be engaged in discussions about maternal morbidity and mortality in Nevada. In addition, maternal levels of care to improve safety and maternal outcomes and the role of the CDC LOCATe Tool will be introduced. Information received from completion of the CDC LOCATe Tool from all the identified maternal hospitals and birthing facilities helps provide a thorough understanding of the maternal and neonatal care capabilities in the area (Catalano, 2017). Appealing to stakeholders and potential participants desire to improve safety for birthing people in Nevada helps satisfy the existence need.

Relatedness Needs

Relatedness needs are based on social interactions with others and maintenance of interpersonal relationships (Aldefer,1969). Once participants have committed to actively engaging in completion of the CDC LOCATe Tool, minimizing respondent burden will be promoted through encouragement of participation by multiple people in various roles of leadership or who are involvement with day-to-day operational activities of the maternity unit or birthing facility. Completion of the CDC LOCATe Tool can be performed by maternity and obstetrics directors, nurse managers, labor and delivery coordinators, and medical directors (Madni, 2021). Facilities are also encouraged to use a minimum number of two individuals to review the answers of the CDC LOCATe Tool prior to submission (Zahn, 2018). Engagement of participants to complete the CDC LOCATe Tool as a team promotes the relatedness need of ERG.

Growth Needs

Growth needs of ERG are related to self-fulfillment and personal growth. At an organizational level, self-fulfillment may be achieved when appealing to participants' desires to achieve safety measure goals. Also, the organization's ability to achieve personal growth can be actualized through improved maternal outcomes. Throughout the implementation process, participants will be offered opportunities to ask questions about the CDC LOCATe Tool. Results of the LOCATe tool will be shared as quickly as possible. The results of the CDC LOCATe Tool can help guide quality improvement efforts and create opportunities to implement safety protocols.

Chapter IV

The proposal for the DNP project is described in detail within this chapter. Topics discussed in this chapter include the setting; population of interest and recruitment; timeline including relevant activities, project tasks, instruments, and procedure for implementation; instruments; personnel resources; risks and threats; and the marketing plan. Finally, the chapter concludes with the evaluation plan of outcomes.

Project Proposal

Setting

According to the Census Bureau (2022), as of July of 2021, there were approximately 3,143,991 people that called the State of Nevada home. Nevada is divided into 17 counties with the most populous being Clark County, home of the well-known city of Las Vegas. An estimated 2.5 million people reside in Clark County, with the remaining 750,000 thousand residents of Nevada dispersed throughout the remaining 16 counties. The State of Nevada, located in the western region of the United States, is the 7th largest state in total area of land, with 85% percent federally owned. Despite the size of the state, Nevada is one of the most sparsely settled (Britannica.com, 2022). The population density for Nevada is estimated to be 28.64 residents per square mile (U.S. Census Bureau, 2022), making Nevada one of the top 10 states with the lowest population density in the U.S. In 2020, the population of people capable of giving birth aged 15-44 was 613,820 (U.S. Census Bureau, 2022).

Sample

The population of interest for this project were leaders from maternity hospitals and birthing facilities located in the state of Nevada.

Eligibility Criteria

Data from Nevada CHIA was planned for use to evaluate birth outcomes, maternal population characteristics such as race/ethnicity, age, health insurance type, and gravida/parity. All identified maternity hospitals and birthing facilities located and reporting to the state of Nevada were selected and invited to participate in the completion of the CDC LOCATe Tool. Participation was on a voluntary basis only.

Exclusion Criteria

For this project, licensed and/or credentialed acute care hospitals were excluded from recruitment and participation if there was no designated maternal/child unit and if there were less than 15 annual deliveries performed onsite. Nellis Airforce Base provides maternity services through Mike O'Callaghan Military Medical Center 99th Medical Group. This hospital was excluded from participation given that it is a federal hospital facility. Medical equipment, personnel, and data collected on site are owned and/or managed by the federal government and statistical data is not reported to the State. All identified maternity hospitals and birth centers were invited to participate. Participation in the project was voluntary. Missing data from participants resulted in exclusion from the project.

Measures and Instruments

Items planned for measurement in this project included the level of risk-appropriate care of maternity hospitals and birthing facilities in Nevada and risk-appropriate care received by birthing people. To evaluate disparity, race and ethnicity of birthing people, insurance status, and geographic regions of locations where people birthed were planned for measurement. To measure risk-appropriate care, evaluation was planned for comparison of birthing people receiving critical care services compared to all birthing people in need of critical care services. In this project, risk-

appropriate care was defined as the correlation of critical care services received to services provided within the maternity hospital or birthing facility. Hospitals with critical care services were identified using the Department of Health and Human Services Nevada Division of Public and Behavioral Health (DPBH) Find a Health Facility search site. Risk-appropriate care was measured by the identification of service level coding produced by the CDC LOCATe Tool. The CDC LOCATe Tool is an online survey based on the 2019 ACOG/SMFM Obstetric care Consensus Guideline titled, Maternal Levels of Care. The most current version, V9.2, of the CDC LOCATe Tool was used for this project. The questions within the CDC LOCATe Tool were categorized according to the ACOG/SMFM Obstetric Care Consensus Guideline and focused on the criteria used to identify the level of care. Information regarding the algorithm used to score the surveys is service marked and is not sharable.

The CDC Severe Maternal Morbidity (SMM) events is a list of 21 severe maternal morbidity indicators and corresponding diagnostic codes from the 10th edition of International Classification of Diseases (ICD-10) (CDC, 2021). Table 3 (*see Appendix E*) lists the codes pertaining to delivery type, maternal comorbidity conditions, and perinatal outcomes. For this project, the CDC SMM event was planned for use to identify serious complications of pregnancy or delivery. Additionally, to assess delivery of risk-appropriate maternal care in Nevada, the information relating to the number of birthing people with preexisting health conditions, conditions developed during pregnancy, and birthing outcomes would have been obtained from hospital discharge summaries, admission records, and birth reports from CHIA.

The project intended to incorporate race and ethnicity categories as defined by the Office of Management and Budget (OMG) standards on race and ethnicity (census.gov, 2022). The categories planned for measurement included White, Black or African American, American

Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander. Birthing people self-identified in these categories would have been evaluated for risk-appropriate care received. Evaluation of risk-appropriate care received by classification of insurance status was planned. Insurance status of birthing people would have been identified through CHIA data from admission records. Risk-appropriate care of birthing people based on geographic location was planned for evaluation. The County Map of Nevada, developed by the Nevada Department of Taxation would have been utilized to identify geographic locations of birthing people receiving care in Nevada (NV.gov, 2017).

Data Sources

Multiple data sources were planned for use in this project and are listed in Table 4 (*see Table 4*). CHIA data planned for analysis included deidentified patient data from admission records, birth reports, and discharge summaries. Topics of interest included health characteristics of pregnant people including age, race/ethnicity, income status, education background, health insurance status, gravida, parity, and weeks of gestation at delivery.

Data from completed LOCATe Tools were analyzed by the representative from the CDC and the maternal level of care of participating facilities were identified and reported. Information obtained from the LOCATe Tool and from CHIA were used to analyze the Level of Maternal Care Received by birthing people in Nevada. Completion of the LOCATe Tool was performed by nurses and/or designated respondents from participating maternity hospitals and birthing facilities. All patient and hospital identifiers were removed during the data analysis and evaluation process. When the CDC LOCATe Tools were scored by the CDC and the level of maternal care identified, data from participating facilities were individually and collectively

evaluated comparing perceived level of maternal care and actual level of care. The levels of maternal care provided by each facility were planned for further analysis and comparison.

Table 4

Variables and Data Sources

Variable	Data Source
Hospitals with Critical Care Services	Nevada Division of Public and Behavioral Health (DPBH) Finda a Facility Search Site
Maternal Level of Care	Completed CDC LOCATe Tools
Maternal High-Risk Conditions	10th edition of International Classification of Diseases (ICD-10) Codes Centers for Health Information Analysis for Nevada (CHIA): Admission Records
Serious Complications of Pregnancy or Delivery	CDC Severe Maternal Morbidity (SMM) Events ICD-10 Codes CHIA: Delivery Records, Discharge Summaries
Race/Ethnicity: White Black or African American American Indian or Alaska Native Asian Native Hawaiian or Other Pacific Islander	Office of Management and Budget Standards of Race and Ethnicity
Insurance Status	CHIA: Admission Records
Geographic Locations	Nevada Department of Taxation County Map of Nevada

Analytic Plan

The performance of data analysis for the project would have been completed by the statistician from CHIA. Additionally, Chi-square analysis would have been used to compare perceived levels of maternal care with the assessed level of care for each of the participating facilities. Descriptions of risk appropriate care by geographic region, race-ethnicity, birth-outcomes, and insurance sources were planned for use to identify disparities. Comparison of rates of risk-appropriate care were planned. When the timeline was adjusted for a low response rate, and CHIA data was no longer available beginning January of 2023, data from the Nevada Hospital Association Survey and publicly available Nevada department of health data was planned for use in analysis.

Project Tasks and Timeline

Gantt Charts were provided listing the following tasks and illustrating the expected dates for completion. The project tasks included the following:

Table 1

GANTT Chart: Summer Semester 2022

Task	Week														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Develop educational module											x	x	x	x	x
Attend Maternal and Child Health Advisory Board Meeting	x														x
Obtain IRB approval						x	x	x	x	x	x	x			
Put Survey on REDCAP												x	x	x	x
Contact Hospital Representatives								x	x	x	x	x	x	x	x

Table 2

GANTT Chart: Fall Semester 2022

Task	Week														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Invitations Email Sent	x														
LOCATe open for Responses	x	x	x	x	x	x									
Office Hours	x	x	x	x	x	x									
Submit Data to CDC							x								
Preliminary Results to Hospitals								x	x						
Correction Period								x	x	x	x	x	x		
Final Data to CDC														x	
Final Results Received															x

Procedure

1. Prior to implementation, the CDC LOCATe Tool was presented to the Nevada Maternal and Child Health Advisory Board in May of 2022. The presentation to the Board was intended for informational purposes and to help identify stakeholders interested in participation or in assisting with identification of appropriate contact personnel at all Nevada maternity hospitals and birthing facilities.
2. Outreach efforts were made via email, in person, or through other marketing and networking efforts to help increase motivation and participation in completion of the CDC LOCATe Tool. Marketing efforts included an emailed PDF version of the CDC LOCATe Tool to provide participants ample amounts of time to begin filling out the

survey prior to the activation of the survey link. In addition to the PDF version of the CDC LOCATe Tool, participants were provided a copy of the ACOG/SMFM Levels of Maternal Care guidelines to use as a reference and for clarification of terms contained in the tool. Networking efforts included speaking with Medical Directors and/or nurses with professional relationships with nursing or hospital leadership personnel.

3. Historically, respondents completing the CDC LOCATe Tool overestimate their perceived level of maternal care provided due to varying reasons such as lack of understanding of Level of Maternal Care guidelines or terminology used within the survey (Madni, et al., 2021). Once the REDCap Survey was made available to the participants, open "office hours" were provided to participants every Friday afternoon from 3pm to 5pm. During open office hours, participants would have been given the opportunity to call in or schedule a teleconference meeting to discuss content of the CDC LOCATe Tool survey, clarify information of language used, and or answer any generalized questions regarding the survey.
4. As the surveys were submitted to the CDC the plan was to share preliminary results and participants would have been provided opportunities to make corrections and resubmit their data.

Monitoring and Evaluation Plan

Monitoring

- Contact to hospital representatives started by September 2, 2022.
- Email invitations for CDC LOCATe Tool participation were sent to hospital representatives by September 9, 2022.
- REDCap CDC LOCATe Tool opened for responses until October 21, 2022.

- Data collected from CDC LOCATe Tool was submitted to CDC by October 28, 2022.
- CDC analysis was completed by November 4, 2022.
- CDC results were shared with participants by November 11, 2022.
- Participants were provided an opportunity to submit corrections by December 9, 2022.
- Final CDC Analysis completed by December 16, 2022.
- Final results were shared with participants by December 23, 2022.

Evaluation

The evaluation of the project was documented and ongoing. Completion of the CDC LOCATe Tool was monitored and recorded weekly, inactivity of participants was documented and listed, follow-up reminder emails with pending due dates for submissions, my contact information and information regarding availability of virtual office hours for consultation and/or assistance with the CDC LOCATe Tool were sent.

Other planned areas of evaluation included:

- Percentage of participating facilities
- Average length of time taken to complete tool before and after corrections.
- Percentage of participating facilities completing changes after initial submission.
- Common questions or concerns regarding the CDC LOCATe Tool or verbiage contained in the CDC LOCATe Tool.
- Percentage of facilities utilizing virtual office hours.

Responses from participants will be recorded as they were received, and report briefings created and shared after the evaluation was completed by the CDC. Completed CDC reports were compiled and were planned for final analysis with CHIA data. Check-in points with faculty mentor occurred regularly to record challenges and barriers to project completion.

Resources and Support

- The CDC LOCATe Tool, and the scoring of the CDC LOCATe Tool, was provided without cost from the CDC.
- Access to REDCAP was provided through UNLV and was used to deploy the tool.
- The time incurred by me, the DNP student and project coordinator, was considered part of the graduate study course.
- Carla DeSisto, PhD, MPH, an epidemiologist working in the Maternal Health and Chronic Disease Team for the Division of Reproductive Health with the CDC provided educational resources and engagement materials through the CDC LOCATe Tool implementation process.
- Support was received from individuals or groups such as, the Nevada Maternal Child Health Advisory Board, obstetrician/gynecologist, nurses, Certified Nurse Midwives, and/or Advanced Practice Nurses, willing to encourage participation and promote engagement from leadership within maternal hospitals or birthing facilities.

Risks and Threats

Identification of the risks and threats associated with the process of completion and the anticipated outcomes of the CDC LOCATe Tool helped direct project planning and organization prior to the project implementation. Minimizing the risks and controlling the threats were planned to help maintain the integrity of the project through all stages. Results of the project may identify discrepancies in perceived, reported, and identified risk-appropriate care. The anticipated threats to the project involved the inclusion of self-reported data, willingness of participation by respondents, inability to maintain deidentified data, inaccurate ICD-10 code assignments, and geographical locations of the facilities.

Self-reported data may not accurately capture the reality of the participant's health care environment. Delegated respondents may not be entirely involved with the day-to-day activities of the maternity floor particularly if those respondents are members of hospital quality assurance committees or the administration team. Designated participants willingness or unwillingness to complete the tool appropriately might also result in incompletion or over exaggeration of submitted responses. Self-reporting data with inaccurate recording of responses will result in inaccurate data collection and reporting.

An additional threat to the project pertains to the ability to maintain deidentified data for potentially smaller data sets. One aim of the project was to evaluate race and ethnicity and actual maternal level of care of the facility where care was provided. The inclusion of this data would help assess potential or actual disparities in care. However, if few birthing people self-identify in a specific race and ethnicity category, maintaining patient anonymity might be compromised. The maintenance of deidentified data is of utmost importance to protect patients and patient information, therefore hospitals would have been assigned numerical values known to myself and to the primary investigator. Careful consideration would be given to selected categories used and in cases of smaller data sets, application of aggregate data would have occurred.

ICD-10 diagnosis codes help identify medical conditions and diagnoses that might require higher level of intervention for complications that might occur during labor and/or childbirth. Inaccurate reporting of ICD-10 codes may result in a failure to capture certain medical conditions or comorbidities. As a result, inaccurate assessment of levels of maternal care provided by each maternity hospital and birthing facility might occur. Use of the CDC SMM Events List and ICD-10 Codes may help mitigate the potential for inaccurate assessment of risk-appropriate care.

Geographical locations of facilities may affect implementation of the CDC LOCATe Tool. Although the tool is a web-based survey, rural facilities might encounter technical issues related to poor internet services or access to properly functioning equipment. Rural facilities might have limited resources or no designated level of neonatal care resulting in failure to identify the hospital as an appropriate candidate for participation. A missed opportunity to participate might result in a failure to provide resources, educational opportunities for the staff, and in the creation of protocols such as in helping expedite maternal transfers to a hospital where risk-appropriate care can be provided.

The risk of the project outcomes may have the potential to adversely affect or reduce patient access to care. Data collected and reported may lead to the closing of smaller or lower performing maternity units. For facilities reporting lower numbers of annual births, lack of funding combined with increased costs of care for birthing people might be fiscally crippling. Rather than correct or improve quality of care provided to targeted patient populations, hospital systems might feel pressured to close maternity units and invest in other specialty services. Closing maternity units or poorly performing hospitals has the potential to further reduce access to care. Potential participants were informed that results of the CDC LOCATe Tool were confidential and all information submitted to the CDC was deidentified. Potential participants were also informed that their results would only be shared with them.

Dissemination Plan

As the CDC LOCATe Tool was completed, respondents from participating facilities were provided with a report of their individual results. General results of the completed CDC LOCATe tool were planned for sharing with leaders of the Nevada Maternal Child Health Advisory Board. Scholarly publications are planned for submission to the American College of

Midwives and the Association of Women's Health and Neonatal Nurses Association journals. Presentations are planned for UNLV graduate research presentations for alumni and other UNLV students, with local representatives, and maternal child health care workers in order to discuss findings and implications for future research and funding related to this project.

Financial Plan

This project was completed through the UNLV school of nursing as partial fulfillment of the requirements for the Doctor of Nursing Practice degree.

Institutional Review Board

An application for expeditious review was submitted to the IRB. According to Federal regulatory statues 45 CFR 46, this project did not meet the definition of 'research with human subjects' and was deemed exempt from needing approval from The University of Nevada, Las Vegas Institutional Review Board, included in Figure 1 (*see Appendix F*).

Chapter V

Project Summary

Although the implementation of the CDC LOCATe Tool to assess risk-appropriate care has worked for many states and perinatal jurisdictions, the voluntary participation strategy for implementation did not work in the state of Nevada. This chapter summarizes the results of the project including findings from the implementation, interpretation of the results, and the overall evaluation of the project to help guide future research and projects.

Adherence to Plan

At the induction of the project, 18 hospitals and 1 free standing birth center were identified. Shortly after implementation began one Northern hospital unexpectedly ceased their operation of maternal/child services. Of the remaining facilities, 11 facilities were in the Southern Nevada region with the remaining 7 facilities spread across Northern Nevada. Of the 7 Northern Nevada hospitals, four were designated as rural facilities (*see Table 1 and Table 2*).

Preparation Phase. Per protocol, an internet search was used to verify the accuracy of the list of maternity hospitals. Contact information (name of an administrator or maternity manager, email address, and phone number) was obtained for all facilities. I contacted professional acquaintances within my network of colleagues, and they also provided contact information of leadership personnel including names, business phone numbers, and email addresses. Information packets were prepared for distribution to all facilities. All facilities in the Northern Nevada region were visited and I physically delivered an information packet. All but two hospitals in the Southern Nevada region were visited and received a physical information packet, all facilities received the same material sent as electronic documents via email. Follow up voice messages were left requesting a call back and/or to schedule an in-person or telephone

meeting to discuss assessment of maternal levels of care and the CDC LOCATe Tool. Email messages explaining the CDC LOCATe Tool, dates of implementation and my contact information were also provided to all identified leaders.

Month One. Per protocol, the survey was distributed by email to all hospital contacts. Visits were made to the maternity unit at every Northern Nevada hospital during the week of September 4 through September 11 and information packets were delivered. Questions were answered and contact information was updated when necessary. Hospital contacts received reminder weekly emails to complete the survey.

Month Two. Weekly reminder emails continued. Each hospital representative was contacted by phone, messages were left offering support, contact information, and requesting information for any changes to contact information, updates were made accordingly. At the end of the six-week initial survey completion period only two hospitals and one birth center had completed the survey. The decision was made to extend the survey completion period for three weeks with continued attempts at weekly contact.

Month Three. At the end of the survey extension, one additional hospital had completed the survey. After conversation with the research team at the CDC, the decision was made to make one final push for survey completion. New emails were drafted, and all contact emails were verified or updated as needed.

Month Four to Project End. The final survey results were submitted to the CDC for scoring as planned. Due to the lack of voluntary survey completion, the planned analysis was deemed not possible. Results were reviewed and reports were prepared for the participants.

Results

As the surveys were completed, the CDC representative was contacted for data submission and initial analyses, however, the representative informed the investigators that all data should be analyzed together rather than individually. Of the 18 facilities invited to participate in the voluntary completion of the CDC LOCATe Tool, leaders from 4 facilities completed the CDC LOCATe Tool in its entirety. Due to the low response rate, the decision was made to extend the submission date to allow more time for other facilities to submit their completed CDC LOCATe Tools. With the extension of the submission date, leaders from the remaining facilities were again contacted and informed of the extension. No further data was collected. In January of 2023, CHIA transitioned to a new contractor and data was no longer available for use as intended.

Sample Description

There are a total of 18 maternal hospitals and birthing facilities (*see Table 1 and see Table 2*) located throughout the state of Nevada. Of all maternity hospitals and birthing facilities identified, 17 are privately owned and 1 facility is publicly owned. facility. Of the 4 participating facilities, 3 are privately owned, and 1 is publicly owned. Of all maternity hospitals and birthing facilities, 3 do not possess Joint Commission accreditation. Of the three non-Joint Commission accredited facilities, 2 are accredited through a different accrediting body. Of the 4 participating facilities, 2 are Joint Commission Accredited. In the Northern Nevada region, there are 7 maternity hospitals. Four of the 7 hospitals are considered rural facilities.

In the Southern Nevada region, there are 3 large, privately owned hospital systems, 1 free standing birth center, and 1 community hospital. Hospital System A is a religious based organization with several free-standing emergency rooms, surgical centers, clinics, and hospitals.

Hospital System B and C are for profit organizations also with several free-standing emergency rooms, surgical centers, clinics, and hospital facilities. Within hospital system A's organization, there are 2 hospital facilities that provide perinatal services. Hospital System B is a for profit organization with multiple free standing emergency room facilities, surgical centers, clinics, and hospitals. Within System B's organization there are 5 facilities that provide perinatal care, 1 of which is in northern Nevada and 4 of which are in the Southern Nevada area. Hospital System C is also a for profit organization that owns several free-standing emergency rooms, surgical centers, clinics, and hospitals. Within Hospital C's organization, there are 3 hospitals that offer perinatal services. The hospitals within each system all report greater than 500 deliveries in a year. In each hospital system there is at least 1 maternity hospital that also provides Level III neonatal intensive care services. All hospitals in the state of Nevada have a minimum of a Level II neonatal intensive care unit. In the Northern Nevada region, there is 1 facility designated as a trauma center and in Southern Nevada, there are 3 hospitals designated as trauma centers. Levels of care are also assigned to facilities caring for trauma patients. Level I trauma centers are able to provide care to people with severe injuries (American College of Surgeons, 2014). Of all the maternity hospitals and birthing facilities in Nevada, only 1 hospital can provide Level 1 trauma care.

Participants of the CDC LOCATe Tool are divided equally with 2 participants from Northern Nevada and the remaining 2 participants from Southern Nevada. Characteristics of maternity hospitals in Nevada are provided in Table 7 (*see Table 7*). There is insufficient data to identify differences between facilities that did or did not complete the survey.

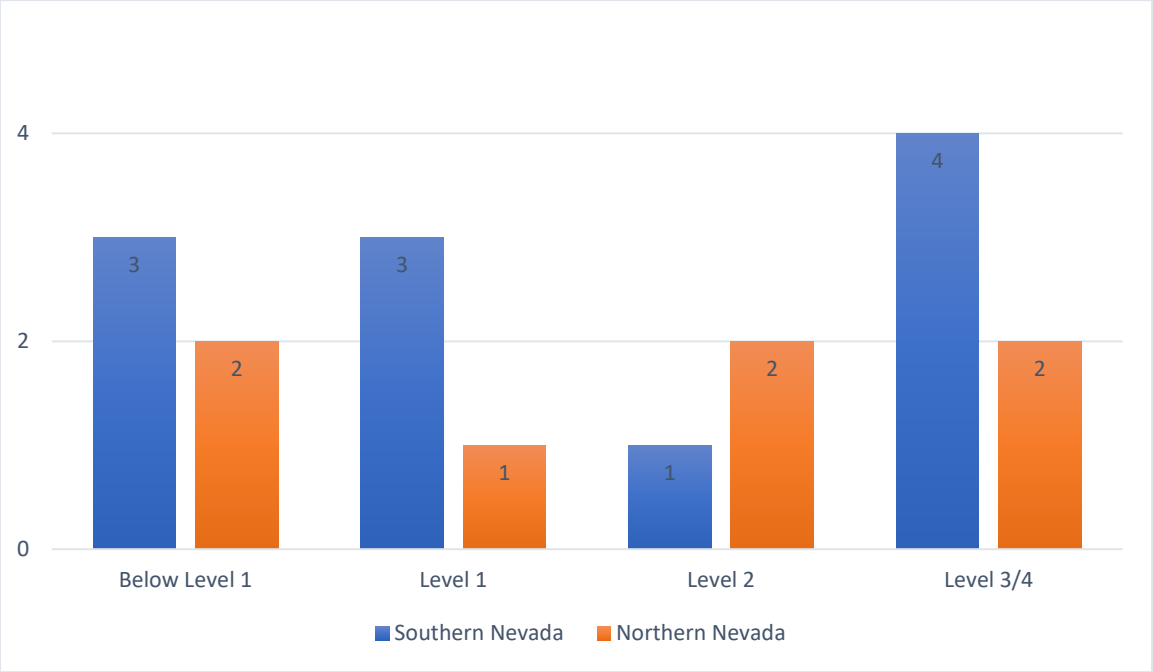
Table 7:
Description of Maternity Hospitals in Nevada

Characteristic	Completed Survey n=4	Did not Complete Survey n=14
Hospital Ownership		
Private	3	14
Public	1	0
Joint Commission	2	13
Accredited		
Hospital Location		
Rural	2	5
Urban	2	9
Births per year		
Less than 100	1	1
101-500	2	1
More than 500	1	12

Of all the facilities invited to participate in the CDC LOCATe Tool completion, 4 facilities have completed the process. Due to insufficient data, there were no identifiable differences identified between facilities that did or did not complete the survey. Due to the absence of completed surveys, the Level of Care in each hospital was estimated and based on data included in the American Hospital Association Annual Survey from 2018. This method of estimation cannot differentiate between levels III and IV. Based on this estimation, 5 (27.8%) hospitals are below level I, 4 (22.2%) are level I, 3 (16.7%) are level II, and 6 (33.3%) are level III or IV. Full results are available in Figure 6 (*see Figure 6*). Due to the age of the data used to estimate hospital level of care, analysis of current risk-appropriate care could not be completed.

Figure 6

Estimated Maternal Levels of Care[1]



1 information analyzed with Nevada Hospital Association Data and Easter article.

Potential for Improvement in Nevada with Risk-Appropriate Care

Reduction in Morbidity and Mortality

In 2021, there were a total number of 33,140 live births that were reported in the state of Nevada and the fertility rate was 54.8 births per 1,000 birthing individuals aged 15 to 44 years of age (DBHS, 2022). The fertility rate in Nevada dropped from 2020 to 2021, but the severe maternal morbidity rate and maternal mortality rate increased. Table 8 (*see Table 8*) lists birth data from 2020 and 2021 and includes rates or maternal death and severe maternal mortality. From 2020 to 2021, there were a total number of 79 cases of maternal deaths. Members of the Nevada Maternal Mortality Review Committee evaluate cases of severe maternal morbidity and maternal mortality and assesses the preventability of maternal death (DBHS, 2022). Both Nevada

Maternal Mortality Review Committee and the CDC have identified that up to 84% of maternal deaths were preventable (DBHS, 2022; CDC, 2022). Implementation of the CDC LOCATe Tool to assess levels of risk-appropriate care has been identified as a strategy to reduce severe maternal morbidity and mortality. Through the identification of risk-appropriate perinatal care, maternity hospitals and birthing facilities will be able identify their ability to provide care for high-risk pregnant people, create educational opportunities for staff, and encourage collaborative efforts to improve care delivery thereby impacting and reducing incidences of severe maternal morbidity and maternal mortality.

Table 8

Birth Data 2020-2021

2020	United States	Nevada
Number of Live Births	3,613,647[1]	33,590[6]
Birth Rate*	55.7 per 1,000[1]	57 per 1,000[6]
Severe Maternal Morbidity	54,750**	551[4]
Severe Maternal Morbidity Rate	144 per 10,000 hospitalizations**	180.3 per 10,000 hospitalizations[4]
Maternal Deaths	861[4]	40[4]
Maternal Death Rate	23.8 per 100,000 live births[4]	119.1 per 100,000 live births[4]
2021	United States	Nevada
Number of Live Births	3,664,292[2]	33,140[7]
Birth Rate*	56.3 births per 1,000[2]	54.8 per 1,000[7]
Severe Maternal Morbidity	N/A**	618[5]
Severe Maternal Morbidity Rate	N/A**	205.6 per 10,000 hospitalizations[5]
Maternal Deaths	1,205[3]	39[5]
Maternal Death Rate	32.9 per 100,000 live births[3]	116.4 per 100,000 live births[5]

Note. 1 CDC Births in the United States, 2020
2 CDC Births in the United States, 2021
3 CDC Maternal Mortality Rates in the United States, 2021
4 Nevada Maternal Morbidity and Mortality Report, 2020
5 Nevada Maternal Morbidity and Mortality Report, 2021
6 Nevada Birth Registry, Nevada Resident Births by Medicaid, 2020
7 Nevada Birth Registry, Nevada Resident Births by Medicaid, 2021
*Per women/birthing people
**CDC, 2020 U.S. SMM data reported 2014

Reduction in Healthcare Costs

Ther occurrence of severe maternal morbidity (SMM) and mortality negatively impacts the health and well-being of birthing people, their babies, and their families. Preventing maternal deaths includes the identification of maternal risk factors that can potentially result in poor maternal outcomes and severe maternal morbidity. If not appropriately addressed severe maternal morbidity can lead to maternal death. As the cost of care continues to increase, complications resulting in severe maternal morbidity or mortality associated with birth also create a financial and economic burden for both families and for the State.

In Table 9, associated costs of uncomplicated and complicated births for both commercially and Medicaid insured individuals are listed (*see Table 9*). Black, et al., (2021) report the estimated costs for uncomplicated childbirth for commercially insured individuals at $23,795. With severe maternal morbidity factored in, the total cost is 47% higher at $50,212 (*see Table 9*). For patients receiving Medicaid coverage, the cost of an uncomplicated birth is estimated at $9,652 and with severe maternal morbidity factored in, the cost is 36% higher at $26,513. Thus, the approximate cost of SMM is $26,513 to $50,212.

Incidences of severe maternal morbidity contribute to increased costs of care. In 2021, 618 cases of severe maternal morbidity were reported in Nevada which equates to $16,385,034 to $31,031,016 in associated costs of care. Prevention of severe maternal morbidity would result in an overall reduction of 494 cases. In reducing occurrences of SMM, Nevada's Total Cost Savings equates to approximately $13,097,422 to $24,804,728.

Table 9

Cost of Delivery (2016)[1]

Insurance	Cost of Care	Cost of Care with Severe Maternal Morbidity/Mortality
Commercially Insured	$23,795	$50,212
Medicaid Insured	$9,652	$26,513

[1]Black, et al. (2021)

Project Evaluation

The mission of this project was to improve access of risk-appropriate care by identifying the levels of maternal care provided by maternity hospitals and birthing facilities in the state of Nevada by the end of 2022. The mission of this project has not been met in its entirety. Out of 18 maternity hospitals and birthing facilities, 4 facilities completed the CDC LOCATe tool.

Despite a low response rate, leaders from the responding facilities benefited from the knowledge of the level of risk-appropriate care they provide. Recognition of the facilities capacities and limitations may compel leaders to create quality improvement measures such as implementation of patient safety protocols, providing updated education to staff, and modifications of policies and procedures that reflect current evidence-based practices. Respondents to the CDC LOCATe Tool will be able to improve access of risk-appropriate care to their local communities receiving care from their facilities.

With a low number of participants, this project demonstrated that voluntary participation in the implementation and completion of the CDC LOCATe Tool to assess risk-appropriate care and identify Maternal Levels of Care in Nevada was not an effective strategy. The next step will be to evaluate the feasibility of other strategies for implementing maternal levels of care

assessment. These strategies include State health policy changes requiring maternity hospitals and birthing facilities to obtain official maternal levels of care designation for regulatory purposes, State provision of monetary incentives to complete levels of care assessment with increased reimbursement for risk appropriate care, and State provision of resources such as personnel to help hospital leaders complete the CDC LOCATe Tool.

Lessons Learned

Perinatal regionalization is an identified strategy used to decrease perinatal morbidity and mortality rates (CDC,2022). Throughout the Unites States, several states and regions have implemented the CDC LOCATe tool and have successfully identified levels of care for both maternal and neonatal populations. Successful implementation in other States occurred over time and with the assistance of a large, invested group of people. In the state of Nevada, implementation of the CDC LOCATe tool was not met with the same reception as other states have described in the existing literature (Vladutiu, et al, 2020). Despite persistence and continued efforts to contact and meet with leaders face to face, the voluntary completion of the CDC LOCATe Tool was met with very few participants. Future attempts at implementation may be achieved as a collective effort with people from various state agencies, coalitions, or groups of students from local colleges and universities interested and invested in the improvement of perinatal health. Multiple champions through the implementation process may result in increased participation.

Several challenges were encountered throughout the implementation process. Through the preparatory stages, identification of maternity hospitals and birthing facilities throughout the state was difficult and not readily accessible. Although the Find a Facility search exists through the State of Nevada's website, there is no current documentation identifying all maternity

hospitals or birthing facilities throughout the State. Additionally, identification of leaders and individuals with responsibility or proper authority and knowledge to complete the CDC LOCATe tool was difficult to obtain. People working through the Nevada Public Health department did not share their information despite my ask. Once the appropriate hospital personnel were identified from face-to-face meetings and through my personal network of colleagues, follow-up via emails or telephone calls were made to ensure that the contact list remained up to date. At the completion of the project, the contact list was shared with the personnel from the Nevada Public Health Department. In the future, authorized parties interested and volunteering their personal time in reattempting to implement the CDC LOCATe Tool should be able to work with closely with personnel from the Nevada Public Health Department and the list of maternity hospitals and birthing facilities at minimum should be shared with the interested parties.

Numerous nursing leaders voluntarily vacated their director or managerial roles resulting in changes in contact and personnel in charge resulting in the necessity to reexplain and describe the project. When meeting in person with nursing leaders, statements were made by various leaders that they were “too busy” but would consider completing the CDC LOCATe tool if time permitted. In consideration of time and potentially reduced resources, I offered assistance to all leaders. I also requested appointment times to discuss the CDC LOCATe Tool and/or to assist with the completion of the CDC LOCATe Too. I ensured that my contact information was easily accessible to nursing leaders and provided school email address and personal phone number on networking business cards and in all documents both electronic and paper that were provided to all invited participants. Nursing leaders were also encouraged to request assistance in completing the tool. Nursing leaders from various hospitals within a large hospital system requested more

information and invited me to attend their obstetrical department meeting. Medical Directors, administrative personnel, and nursing leadership from 4 southern Nevada facilities were in attendance. After information was presented to the leaders, I sent follow up communication via email and telephone, with further contact discontinued by the nursing leaders. Patient care and the immediate needs of the staff should always take precedence, however despite the student's persistent communication efforts, nursing leaders would not provide any response or communication to the student.

In sharing information about the CDC LOCATe Tool, two nursing leaders shared that they hired and paid a company to complete a levels of care assessment. The CDC LOCATe Tool is vetted and is copyright protected. The nursing leaders were informed of the violation and when asked to name the company providing the services, no information was given. These incidences were reported to the CDC representative. Of the two hospitals that paid for the levels of care assessment, one hospital has elected to pursue the official Joint Commission designated maternal levels of care. Lack of communication and transparency from hospital leaders will need to be considered for future attempts at implementation of the CDC LOCATe Tool. Staffing and resource allocation in a hospital may not be adequate for voluntary completion of the CDC LOCATe Tool. It is alarming that hospital leaders have used a company that is profiting from the use of a non-validated level of care assessment on their facilities. The non-validated level of care assessment tool may not adequately assess the maternal level of care provided by the hospital thus over or underestimating the hospital's available resources or ability to provide risk-appropriate care.

Discussion of Project

Summary

The CDC LOCATe tool provides a standardized assessment of a maternity hospital or birthing facility with the level of risk appropriate care that the facility is able to provide. Although the CDC LOCATe tool does not provide a formal level of care designation, participants utilize the information to identify quality improvement measures, implement patient safety checklists, develop perinatal transport protocols, or create changes to improve perinatal care. However, the benefits of the CDC LOCATe Tool are best actualized when all maternity hospitals or birthing facilities within a state or region participate and complete the CDC LOCATe Tool. This project aimed to implement the CDC LOCATe tool through a voluntary participation strategy. This strategy was not effective in Nevada.

Although an attempt was made to implement the CDC LOCATe tool, hospital leaders were not motivated to voluntarily complete the tool. Completion of the CDC LOCATe Tool to identify maternal levels of care could be achieved through required Joint commission accreditation or through policy changes and modifications to current Nevada statutes addressing Neonatal levels of care. Although one facility is voluntarily seeking formal Joint Commission designation of Maternal levels of care, there are maternity hospitals and birthing centers that are not Joint Commission accredited (See Table 1 and 2). Consideration should be given to policy changes promoting the implementation of the CDC levels of maternal care assessment. Current Nevada statutes define Neonatal levels of care. Health policy can be directed at changing current statutes to include maternal levels of care thereby enhancing or improving utilization of other strategies currently in place in the State of Nevada.

Interpretation and Integration with Literature

In prior studies (Madni, et al., 2021, DeSisto, et al., 2023) respondents of the LOCATe tool have reported an overestimation of their perceived level of care when compared to the CDC LOCATe Tool assessed level of care. In Madni's (2021) study, of the 418 facilities with non-missing data, 46.4% of respondents self-reported a higher level of care than what was LOCATe assessed. Of the 4 respondents to the Nevada CDC LOCATe tool, 2 of the respondents self-reported a higher level of maternal care than the CDC LOCATe assessed level of maternal care.

In most instances, the variance in self-reported level of care and LOCATe assessed level of care is a result of a reported discrepancy in available personnel and services (Madni, et al., 2021). Overestimation of the level of care can be problematic. Facilities that perceive the ability to provide a higher level of risk-appropriate care may not be properly equipped to provide a higher level of care (Madni, et al., 2021). The discrepancies in self-reporting and LOCATe reported levels of care demonstrate the importance of identifying maternal levels of care in maternal hospitals and birthing facilities in Nevada.

The U.S. maternal morbidity and mortality rates are on the rise in the United States (CDC, 2021). Nevada's maternal morbidity and mortality statistics have also mirrored the trends of increasing maternal morbidity and mortality rates of the U.S. over the past few years. The general fertility rate in the United States is 56.3 births per 1,000 birthing individuals 15 to 44 years of age (CDC, 2022). In prior years, Nevada's maternal morbidity and mortality rate was lower than the national rate (Office of Analytics, 2022). Unfortunately, Nevada's mortality rate has increased, and Nevada continues to perform poorly in several health care areas including overall perinatal care (Office of Analytics, 2022). Other areas where Nevada performs poorly include:

1. Prenatal care in the first trimester

2. Primary cesarean section rate

3. Infant mortality rate

4. Preterm birth

Perhaps the most significant findings of Nevada's maternal morbidity and mortality rate are the disparities in outcomes amongst the demographic of birthing people. Birthing people of color have been reported to experience higher rates of maternal morbidity and mortality (Office of Analytics, 2022). The assessments produced from CDC LOCATe Tool alone cannot correct the disparities, but findings from the implementation of the LOCATe tool and reported assessments or risk-appropriate care can help begin conversations regarding necessary changes to improve maternal outcomes. This information can also help the State uncover the extent of disparities in care. Future research should be considered in implementation of the CDC LOCATe tool as a strategy to reduce maternal mortality. Future consideration should also be considered in evaluating disparities and risk appropriate care once maternal levels of care have been identified.

Implications for Nursing Practice

Nurses working in perinatal health can help improve maternal and neonatal outcomes both directly and indirectly. Nursing leaders can impact systemic changes in their health care facilities by identifying quality improvement measures, to help with learning gaps, improving staffing ratios, and through implementing evidence-based practices. The nursing process entails assessment, diagnosis, planning, implementation, and evaluation. As the state of Nevada attempts to address and correct severe maternal morbidity and mortality, without the completion of the CDC Levels of care Assessment Tool, we are still missing the assessment component of this process. Before changes can be made, nurses can help identify the extent of the contributing

factors of maternal morbidity and mortality by assessing the capabilities of their facilities. The first step in fixing a problem is to first identify that there is a problem. The recent data reporting of increased U.S. Maternal morbidity and mortality rates is alarming and unacceptable. Nevada's own reporting of maternal mortality mirrors that of the U.S. and although on a smaller scale, one maternal death is one death too many, especially when data shows that 80% of maternal deaths can be prevented (CDC,2022). As nurses, we should work collectively and collaboratively to help make a positive contribution to improving maternal outcomes in Nevada.

Utilization and Dissemination

Future Scholarly Activity

Despite my efforts to implement the CDC Levels of Care Assessment Tool to assess risk-appropriate perinatal care in the state of Nevada, potential for future scholarly activity remains viable. Prior research has identified discrepancies in participant's perceived level of risk-appropriate care when compared to CDC LOCATe assessed level of risk-appropriate care. This discrepancy means that some facilities may not have the capacity to provide risk-appropriate care. In this project, participants followed a similar pattern with perceived level or risk-appropriate care discordant with LOCATe assessed level of care. Without an appropriate assessment of levels of care in all maternity hospitals and birthing facilities, we are unable to identify if lack of service, equipment, or personnel contributes to the causes of severe maternal morbidity.

In this project, nursing leaders were the greatest barrier in achieving full participation for the implementation of the CDC LOCATe Tool to assess risk-appropriate care. Future scholarly work might include evaluation of nurses' perspectives of voluntary participation in implementation projects. A qualitative study utilizing a focus group with nurse leaders might

help future scholars identify leadership styles that contribute to voluntary participation in implementation projects. Another possibility is assessing willingness of participants to participate in the study by adding additional questions into the CDC LOCATe Tool to identify any barriers nursing leaders may have encountered.

Hospitals leaders invited to participate in the CDC LOCATe Tool have paid a company to assist them in assessment of their maternal level of care. One can only speculate that hospitals may seek to protect their information and choose not to share their data with well-intentioned volunteers from the community. Further consideration should be given to groups of students or people in lieu of an individual student should reimplementation be attempted. Alternative hospital staff, familiar with the operations of the maternal/child unit, should be considered when requesting to participate in the completion of the CDC LOCATe Tool. Hospital administrators or quality assurance personnel may elect to delegate the task to the maternal/child staff, but multiple people in leadership positions within the maternity hospitals or birthing facilities should be contacted and asked to participate in the implementation of the CDC LOCATe Tool.

Ideally, the CDC LOCATe Tool should be completed by all maternal hospitals and birthing facilities within the state. Information collected from completed CDC LOCATe Tools can help inform the State of Nevada of areas in need of improvement or of facilities truly capable of providing risk-appropriate perinatal care. Although the CDC LOCATe Tool does not provide an official designation of the maternal levels of care, identification of maternal levels of care can help facilities identify quality improvement measures, implement patient safety checklists, develop perinatal transport protocols, or create changes to improve perinatal care and decrease the incidence of severe maternal morbidity that can potentially lead to maternal mortality. Should hospitals remain resistant to participating in assessment of levels of risk-appropriate care,

future scholarly activities may consider comparison of CDC LOCATe Tool criteria and Trauma Center Levels of risk-appropriate care to help identify availability of resources and protocols in place.

Plans for Dissemination

Updated information was provided to members of the health department. No further requests for information were received. Policy changes should be considered to help identify maternal levels of care and to ensure that Nevada's birthing population is able to receive adequate risk-appropriate care. Results of this project will be considered for submission for both presentations at national professional organization conferences and for peer-reviewed journal publications.

Appendix A

Table 1: Northern Nevada Birthing Facilities

Facility Name	Type of Facility	Location: City/County	Number of NICU Beds	NICU Level	Joint Commission Accreditation	Number of Deliveries (2018)	Total Number of Beds
Carson Tahoe Regional Medical Center	Hospital	Carson City Carson City	N/A	II, III	No	961	211
Northern Nevada Sierra Medical Center	Hospital	Reno Washoe	12	II	Yes	N/A	158
Renown Regional Medical Center	Hospital	Reno Washoe	39	III	Yes	4487	808
Banner Churchill Community Hospital	Hospital	Fallon Churchill	N/A	I	Yes	344	25
Humboldt General Hospital	Hospital	Winnemucca Humboldt	N/A	I	No	366	67
Northeastern Nevada Regional Hospital	Hospital	Elko Elko	N/A	I	Yes	511	75
William Bee Rierie Hospital	Hospital	Ely White Pine	N/A	I	Yes	126	25

Appendix B

Table 2: Southern Nevada Birthing Facilities

Facility Name	Type of Facility	Location: City/County	Number of NICU Beds	NIUC Level	Joint Commission Accreditation	Number of Deliveries (2018)	Total Number of Beds
Centennial Hills Hospital and Medical Center	Hospital	Las Vegas Clark	18	II, III	Yes	828	234
Henderson Hospital	Hospital	Henderson Clark	8	III	Yes	N/A	170
Summerlin Hospital and Medical Center	Hospital	Las Vegas Clark	52	II, III	Yes	743	485
Spring Valley Hospital and Medical Center	Hospital	Las Vegas Clark	30	II, III	Yes	849	430
Mountain View Hospital	Hospital	Las Vegas Clark	24	II, III	Yes	1707	425
Sunrise Hospital and Medical Center	Hospital	Las Vegas Clark	72	II, III	Yes	2700	834
Southern Hills Hospital and Medical Center	Hospital	Las Vegas Clark	15	II, III in progress	Yes	673	265

St. Rose Dominican Hospital Siena Campus	Hospital	Henderson Clark	26	III	Yes	3473	326
St. Rose Dominican Hospitals San Martin Campus	Hospital	Las Vegas Clark	6	II	Yes	1221	147
University Medical Center	Hospital	Las Vegas Clark	40	II, III	Yes	2069	541
Serenity Birth Center	Free Standing Birth Center	Las Vegas Clark	N/A	N/A	N/A	N/A	2

Appendix C

Figure 2: Sample Letter

September 19, 2022

Hospital/Birthing Facility Name

Maternal/Child Department

XXXX Street Name

City, NV 89107

To Whom It May Concern:
My name is Janice Enriquez. I am a DNP Student at UNLV and will be implementing the CDC Levels of Care Assessment Tool (LOCATe) in Nevada. My purpose for this correspondence is to request your participation in completing the CDC LOCATe Tool.

The CDC LOCATe will be made available as an online survey through REDCap. The information from the CDC LOCATe will provide your hospital with an objective measure of the maternal and neonatal levels of care. As part of the CDC LOCATe implementation, the CDC will evaluate the responses and feedback will be provided about your facility. Additionally, the information from the Tool can be used by your facility to obtain the formal maternal level of care designation through the Joint Commission.

Within this folder I have included my Power Point slides presented at the most recent Maternal & Child Health Advisory Board (MCHAB) meeting from August 5, 2022, a printed copy of the REDCap Survey, the ACOG and SMFM Obstetric Care Consensus: Maternal Levels of Care, and the AAFP Policy Statement: Levels of Neonatal Care for your review.

If I can provide you with any additional information or if you are ready to participate in the completion of the CDC LOCATe Tool, please feel free to contact me at EnriqJ3@unlv.nevada.edu. I appreciate your time and hope that you have a wonderful day.

Sincerely,
Janice Enriquez, MSN, APRN, CNM, WHNP-BC
DNP Student, University of Nevada, Las Vegas

Appendix D

Figure 3: Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING
Between
Centers for Disease Control and Prevention, National Center For Chronic Disease Prevention and Health Promotion, Division of Reproductive Health and Board of Regents, Nevada System of Higher Education on behalf of the University of Nevada, Las Vegas concerning Implementation of CDC LOCATe

Purpose

This Memorandum of Understanding (MOU) sets forth the terms and understanding between the Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), Division of Reproductive Health (DRH) (hereinafter referred to as "CDC") and Board of Regents, Nevada System of Higher Education on behalf of the University of Nevada, Las Vegas (hereinafter referred to as "UNLV"), to implement the CDC Levels of Care Assessment Tool (LOCATe).

Background

The CDC developed LOCATe to provide a simple tool that assists states and other juridisctions in monitoring risk-appropriate care. LOCATe produces standardized assessments of maternal and neonatal care capabilities of facilities. CDC LOCATe is based on the most recent guidelines and policy statements issued by the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, and the Society for Maternal-Fetal Medicine. In order to benefit public health outcomes CDC and UNLV seek to collaborate on using CDC's LOCATe to assess maternal and neonatal care in Nevada as well as partner on other related activities described here related to improving neonatal and maternal care.

Aims

To the extent government resources and appropriations allow, and as consistent with applicable federal law, CDC will conduct the following activity along with UNLV:

1) Use CDC LOCATe to assess levels of maternal and neonatal care of the hospitals in Nevada.

CDC and UNLV will be jointly responsible for Aim 1. CDC will provide technical assistance as needed and as resources allow. To the extent CDC has custody and/or control of the LOCATe data, CDC will maintain such information as confidential and/or proprietary to the full extent allowable under applicable law.

Approach

CDC will create a version of LOCATe in SurveyMonkey/REDCap for UNLV and share with the UNLV point of contact. UNLV will implement LOCATe, including monitoring and receiving responses for its hospitals. This data will be de-identified by UNLV and then shared with CDC via an encrypted file. CDC will apply the algorithm developed to assess a maternal and neonatal level of care for each participating hospital. Upon completion of the assessment, a copy of final analytic files will be provided back to the point of

contact identified as the UNLV Data Owner. A copy of the de-identified analytic files will be retained by CDC, for reference and in compliance with applicable federal records laws and regulations and until UNLV indicates they have completed work on their Aims. The LOCATe data is not owned by CDC. The jurisdiction is responsible for the integrity of the LOCATe data. UNLV retains ownership of their LOCATe data.

Use/Name of Logo
The use of the CDC's logo on materials and publications can only be used with express permission from CDC. Requests for such use will be handled on a case by case basis.

INTELLECTUAL PROPERTY
Nothing in this MOU, nor any act or omission, shall be interpreted as the conveyance or release by CDC, or UNLV of any rights, title, or interest in and to the intellectual property of any party. UNLV agrees that the materials provided by CDC are public domain materials. Health and Human Services (HHS) and CDC retain the right to use the content and materials that HHS and CDC provide for government purposes, including the right to share with collaborators or requestors. Any report, article, or other paper or product prepared by employees of the Federal Government as part of their official duties is, under the U.S. Copyright Act, a "work of the United States Government" for which copyright protection under Title 17 of the United States Code is not available.

NO ENDORSEMENT OR AGENCY
Nothing in this MOU shall be interpreted as a direct or indirect endorsement by any party or any of its affiliates or subsidiaries. UNLV agrees not to perform any action publicly or privately which may reasonably lead any party to interpret such action as an endorsement. Any violation of this provision shall be deemed a material breach of this MOU. Neither this MOU nor any event shall be construed as creating any agency, partnership, or other form of joint enterprise among the MOU parties.

UNLV will not use the name of HHS, or any component agencies, including CDC, except in factual publicity. Factual publicity includes dates, times, locations, purposes, and agendas, even those unrelated to the subject matter of this MOU. Such factual publicity shall not imply that the involvement of HHS or CDC serves as an endorsement of the general policies, activities, or products of UNLV; where confusion could result, publicity should be accompanied by a disclaimer to the effect that no endorsement is intended. UNLV will clear all publicity materials related to this MOU and the materials it covers with CDC to ensure compliance with this paragraph.

LEGAL AUTHORITY AND STIPULATIONS
CDC's participation in activities referenced is subject to the availability of appropriations, resources, and in conformance with CDC public health priorities. Nothing in this MOU shall obligate HHS or CDC to any current or future expenditure of resources in advance of the availability of appropriations from Congress.

This MOU is authorized under sections 301(a) and 317K of the Public Health Service Act (42 U.S.C. §§ 241(a) and 247b-12.)

CDC as a federal agency, must comply with federal laws including the Freedom of Information Act (FOIA), 5 U.S.C. 552; Privacy Act, 5 U.S.C. 552a; and other applicable federal statues or regulations regarding the collection, maintenance, and disclosure of information in its custody and control.

CDC will employ all reasonable efforts to maintain the data UNLV provides, that is considered by UNLV to be "confidential" and/or "proprietary", and is labeled as such by UNLV, with such efforts to be no less than the degree of care employed by CDC to preserve and safeguard CDC's own information. CDC will not disclose such confidential and/or proprietary data to anyone except CDC employees or personnel (including CDC contractors) who have a need for the data unless required by applicable law. In accordance with FOIA, upon receiving a third party request for the data, CDC will afford UNLV the opportunity to review the data for public release and formally object to its release.

CDC's role in this MOU is one of collaborator and will not be participating in any influential capacity in the internal, business affairs of UNLV. CDC provides technical assistance to organizations and state and local health departments in order to fulfil CDC's public health mission to improve maternal care. CDC's technical assistance under this MOU does not imply an endorsement of any particular facilities.

FUNDING

Nothing in this MOU shall be deemed as a commitment or obligation of CDC or UNLV funds. Opportunities for additional collaborative projects must be reviewed and supported under separately executed MOUs or other appropriate mechanisms. Each Party will bear any and all costs and expenses with regard to its personnel assigned to this project.

LIABILITY

Each party shall be responsible for its own acts and the results thereof and shall not be responsible for the acts of the other parties and the results thereof. Each party therefore agrees that it will assume all risk and liability to itself, its agents or employees, for any injury to persons or property resulting in any manner from the conduct of its own operations and the operations of its agents or employees under this MOU, and for any loss, cost, damage, or expense resulting at any time from any and all causes due to any act or acts, gross negligence, or the failure to exercise proper precautions, of or by itself or its agents or employees, while conducting activities under and pursuant to this MOU. The Government's liability shall be governed by the provisions of the Federal Tort Claims Act, [28 U.S.C. 2671-80 (1976)].

GOVERNING LAW

This MOU shall be governed by applicable federal law.

ENTIRETY

This MOU constitutes the entire agreement between the parties with respect to the subject matter hereof. This MOU supersedes any prior agreements, understandings, negotiations, or discussions

between the parties with respect to the subject matter hereof. This MOU may not be amended or changed except by written instrument duly executed by each of the parties.

EFFECTIVE DATE
This MOU will become effective on the date ("Effective Date") of the last signatory to the MOU.

REVISIONS/AMENDMENTS
It is understood and agreed that the parties may revise or modify this MOU by written amendment hereto, provided such revisions or modifications are mutually agreed upon.

TERMINATION
This MOU is entered into voluntarily by all parties, and may be modified by mutual written consent of authorized officials for the UNLV and CDC. This MOU may be terminated by either party within thirty (30) days advance written notice. In the absence of a mutual agreement by authorized officials from each UNLV and CDC to continue to further this partnership, this MOU shall end on December 30, 2023.

Approval

The undersigned concur with this agreement.

	3/24/22	Jean Y. Ko -S5 Digitally signed by Jean Y. Ko -S5 Date: 2022.03.29 14:46:24 -04'00'	
Brad R. Woods, Ph.D. Executive Director and Research Integrity Officer Office of Research Integrity Board of Regents, Nevada System of Higher Education on behalf of the University of Nevada, Las Vegas	Date	Jean Ko, Ph.D. CDR, US Public Health Service Lead, Maternal Health and Chronic Disease Team Division of Reproductive Health Centers for Disease Control and Prevention	Date

Appendix E

Table 3: Severe Maternal Morbidity Indicators and ICD-10 Codes

Adapted from CDC and Nevada Maternal Mortality and Server Morbidity Report

Classification	Severe Maternal Morbidity Indicator	ICD-10 Procedure Code
Diagnosis	Acute myocardial infarction	121.xx, 122.x
Diagnosis	Aneurysm	171.xx, 179.0
Diagnosis	Acute renal failure	N17.x, O90.4
Diagnosis	Adult respiratory distress syndrome	J80, J95.1, J95.2, J95.3, J95.82x, J96.0x, J96.2x, R09.2
Diagnosis	Amniotic fluid embolism	O88.1x
Diagnosis	Cardiac arrest/ventricular fibrillation	I46.x, I49.0x
Diagnosis	Disseminated intravascular coagulation	D65, D68.8, D68.9, O72.3
Diagnosis	Eclampsia	O15.x
Diagnosis	Heart failure/arrest during surgery or procedure	I97.12x, I97.13x, I97.710, I97.711
Diagnosis	Puerperal cerebrovascular disorders	I60.xx-I68.xx, O22.51, O22.52, O22.53, I97.81x, I97.82x, O873
Diagnosis	Pulmonary edema/Acute heart failure	J81.0, I50.1, I50.20, I50.21, I50.23, I50.30, I50.31, I50.33, I50.40, I50.41, I50.43, I50.9
Diagnosis	Severe anesthesia complications	O74.0, O74.1, O74.2, O74.3, O89.0x, O89.1, O89.2
Diagnosis	Sepsis	O85, O86.04, T80.211A, T81.4XXA, R65.20, A40.x, A41.x, A32.7
Diagnosis	Shock	O75.1, R57.x, R65.21, T78.2XXA, T88.2XXA, T88.6 XXA, T81.10XA, T81.11XA, T81.19XA
Diagnosis	Sickle cell disease with crisis	D57.0x, D57.21x, D57.41x, D57.81x
Diagnosis	Air and thrombotic embolism	I26.x, O88.0x, O88.2x, O88.3x, O88.8x

Procedure	Conversion of cardiac rhythm	5A2204Z, 5A12012
Procedure	Blood transfusion	30230H0, 30230K0, 30230L0, 30230M0, 30230N0, 30230P0, 30230R0, 30230T0, 30230H1, 30230K1, 30230L1, 30230M1, 30230N1, 30230P1, 30230R1, 30230T1, 30233H0, 30233K0, 30233L0, 30233M0, 30233N0, 30233P0, 30233R0, 30233T0, 30233H1, 30233K1, 30233L1, 30233M1, 30233N1, 30233P1, 30233R1, 30233T1, 30240H0, 30240K0, 30240L0, 30240M0, 30240N0, 30240P0, 30240R0, 30240T0, 30240H1, 30240K1, 30240L1, 30240M1, 30240N1, 30240P1, 30240R1, 30240T1, 30243H0, 30243K0, 30243L0, 30243M0, 30243N0, 30243P0, 30243R0, 30243T0, 30243H1, 30243K1, 30243L1, 30243M1, 30243N1, 30243P1, 30243R1, 30243T1
Procedure	Hysterectomy	0UT90ZZ, 0UT94ZZ, 0UT97ZZ, 0UT98ZZ, 0UT9FZZ, 0UT90ZL
Procedure	Temporary tracheostomy	0B110Z4, 0B110F4, 0B113Z4, 0B113F4, 0B114Z4, 0B114F4
Procedure	Ventilation	5A1935Z, 5A1945Z, 5A1955Z

Appendix F

Figure 5: IRB Approval

ORI-HS, Non-Committee Review

Notice of Excluded Activity

DATE: July 25, 2022

TO: Jennifer Vanderlaan
FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: UNLV-2022-314 Nevada LOCATe implementation
SUBMISSION TYPE: Initial

ACTION: No Human Subjects Research
REVIEW DATE: July 25, 2022
REVIEW TYPE: ADMINISTRATIVE REVIEW

Thank you for your submission of materials for this proposal. This memorandum is notification that the proposal referenced above has been reviewed as indicated in Federal regulatory statutes 45 CFR 46.

The Office of Research Integrity - Human Subjects has determined this request does not meet the definition of 'research with human subjects' according to federal regulations, and there is no further requirement for IRB review.

Any changes to this excluded activity may cause this request to require a different level of review, so please contact our office to discuss any anticipated changes.

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your project title and project ID in all correspondence.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

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Curriculum Vitae

Janice Enriquez, MSN, APRN, CNM, WHNP-BC, CLT, CBCN

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Professional Summary

Compassionate and committed Advanced Practice Registered Nurse with excellent communication and interpersonal skills, utilizing a transformative skill set to inspire creativity, promote productivity through collaboration, and expand provision of exceptional and meaningful patient care experiences.

Qualification Highlights

- Advanced Practice Registered Nurse with 20 years of health care experience in women's health and oncology as a Women's Health Nurse Practitioner, Certified Nurse Midwife, and Registered Nurse.
- Experienced clinical instructor educated learners at various stages in their careers; able to foster creativity and critical thinking skills throughout the learning experience.
- Offer alternative, yet important learning experiences that help create well rounded professionals, empower learners to assertively implement newly learned skills correctly and safely.
- Adept at promoting a learning environment that demonstrates trust, respect, and inclusivity for the learner in the role as a student, patient, and/or peer.
- Experienced relief charge nurse, able to evaluate skills and strengths of staff; flexible with continuously changing acuity levels; implement staffing adjustments; train and support newly graduated registered nurses; coordinate patient care between units; communicate with other leadership personnel if needed; communicate with other members of patients' care team quickly and efficiently.
- Patient advocate committed to providing high quality and efficient patient care at bedside, and through voluntary efforts with community outreach groups and Professional organizations.
- Committed to improvement of care for populations of interest, participate with Professional organizations' lobbying efforts at both local and national levels.
- Innovative and inspirational, able to identify areas of strength and improvement in delivery of care, collaborates and communicates with peers and colleagues to help improve and/or develop tools to ease impact of change.
- Dedicated to interprofessional collaboration, works closely with breast surgeons and peers; Implemented monthly Journal Club meetings, encourage communication among peers to facilitate participation and leading of monthly journal club meetings.
- Exceptional capacity to multi-task, currently working to implement protocol for Lymphedema Care and Quality Improvement Measures for Breast Screening.

Skills

- Repeatedly commended by patients, physicians, and supervisors for outstanding quality of care; received consistent mention in care-survey responses.
- Excellent communication skills
- Quick learner and adapts easily to new situations.
- Detail oriented and demonstrates astute judgement in critical clinical situations.
- Able to remain calm and focused in various types of critical situations.
- Provide personalized, patient and family centered, culturally competent care.
- Perform limited ultrasounds for pregnancy confirmation and assessment of fetal well-being.
- Perform well woman visits efficiently while still providing personalized care to each patient.
- Provide patient focused reproductive life planning and contraceptive counseling.
- Able to place and remove intrauterine and implantable contraceptive devices.
- Attending midwife for over 100 deliveries in hospital setting; able to identify and repair vaginal lacerations within scope of practice; able to request assistance for complicated labor management and/or birth.
- Able to interpret fetal heart tracings with ease and implement necessary resuscitative measures.
- Evaluate critical diagnostic findings and disclose results compassionately.

Professional Experience

- **New Beginnings OB/GYN**, Las Vegas, NV
  Advanced Practice Registered Nurse, January 2022 - present
- **OptumCare,** Las Vegas, NV
  Breast Care Advanced Practice Clinician, May 2019 – January 2022
- **Planned Parenthood of Orange and San Bernardino Counties**, Victorville, CA
  Clinician, October 2017 – April 2019
- **Women's Health Associates of Southern Nevada,** Henderson, NV
  Nurse Midwife/Women's Health Nurse Practitioner, February 2016 – September 2017
- **College of Southern Nevada,** Las Vegas, NV
  Clinical Instructor, January 2016 – August 2016
- **Beach Cities Midwifery,** Corona, CA
  Nurse Midwife/Women's Health Nurse Practitioner Intern, August 2015 – December 2015
- **Southern Hills Hospital**, Las Vegas, NV
  Labor and Delivery, Staff RN, 2006 – 2015
- **Sunrise Hospital & Medical Center**, Las Vegas, NV
  Labor and Delivery, Staff RN, 2002 – 2006
- **Fountain Valley Regional Hospital & Medical Center**, Fountain Valley, CA
  Oncology, Staff RN, 2001 – 2002

Volunteer Activities

- Vice-President, American College of Nurse-Midwives, Nevada Chapter, 2017
- Nevada Cancer Coalition Thrive Task Force
- Nevada Cancer Coalition Southern Nevada Breast Cancer Collaborative Task Force
- Nevada Medical Reserve Corps
- Oncology Nursing Certification Corporation, Item Writing Workshop 2022
- Created community fund raising event for March of Dimes 2016, 2017
- Created community event and clothing drive for Safe Nest 2017
- Las Vegas Rescue Mission
- The Just One Project

Education

- **Doctor of Nursing Practice, Candidate**
  University Nevada, Las Vegas, Las Vegas, NV ▪ Currently enrolled
  Expected date of completion June 2023
- **Masters of Science, Nursing**
  California State University, Fullerton, Fullerton, CA ▪ 2015
- **Bachelors of Science, Nursing**
  University of Phoenix, Las Vegas, NV ▪ 2006
- **Associates of Science, Nursing**
  Santa Ana College, Santa Ana, CA ▪ 2001
- **Associates of Arts, Sociology**
  Santa Ana College, Santa Ana, CA ▪ 1998
- **Associates of Arts, Liberal Arts**
  Santa Ana College, Santa Ana, CA ▪ 1998

Professional Organizations

- Member, American College of Nurse-Midwives
- Member, American Association of Nurse Practitioners
- Member, Nevada Advanced Practice Nurse Association
- Member, Nurse Practitioners in Women's Health
- Member, American Society for Colposcopy and Cervical Pathology
- Member, National League for Nursing

Awards & Recognition

Promise of Nursing, California State University, Fullerton, 2015
Humanitarian Award, California State University, Fullerton, 2015
Nevada Nurse Foundation Scholarship Recipient, Doctorate Program, 2023

License & Certifications

Licensure:	Registered Nurse, California	585177
	Registered Nurse, Nevada	RN40967
	Nurse Practitioner, California	95003332

Nurse Midwife, California	235761
Advanced Practice Registered Nurse, Nevada	APRN002119
Nevada Pharmacy Controlled Substance License	CS24279
DEA & NPI	Available on request

Certifications:

American Heart Association, Basic Life Support (BLS)
American Heart Association, Advanced Cardiac Life Support (ACLS)
American Midwifery Board Certification
National Certification Corporation, Women's Health Nurse Practitioner
Academy of Lymphatic Studies, Certified Lymphedema Therapist
American Council of Exercise, Certified Health Coach
American Council of Exercise, Weight Management Specialist
American Council of Exercise, Fitness Nutrition Specialist
Cancer Exercise Specialist
Oncology Nursing Credentialing Center, Certified Breast Care Nurse