Improving Birth Outcomes in West Virginia

A Report on the Percentage of Very Low Birth Weight (VLBW) infants delivered at facilities for high-risk deliveries and neonates

Ann Dacey, Nurse Coordinator
West Virginia Perinatal Partnership
WVU National Center of Excellence in Women's Health

Mary Boyd, MD, FAAP, President
WV Chapter, American Academy of Pediatrics

May, 2011

With special thanks to:

Gary L. Thompson
State Registrar of Vital Statistics
West Virginia Department of Health and Human Resources
Bureau for Public Health

Tom Light
WV Health Statistics Center
West Virginia Department of Health and Human Resources
Bureau for Public Health

Cris Britton, Database Specialist
Martha Mullett, MD, MPH, Director
West Virginia University School of Medicine
Birth Score-Developmental Risk Screen and Newborn Hearing Screening System

This report explores the occurrence of babies weighing less than 1500 grams born at West Virginia Hospitals without regard to residence states of mothers. Improving the number of very low birth weight babies born at Level III hospitals may improve the infant mortality rate among babies who are born in West Virginia hospitals. This report examines the quality of obstetric care in WV hospitals and therefore does not does not explore the incidence of West Virginia babies less than 1500 grams born at out of state hospitals. It does not explore the infant mortality rates at individual hospitals.

Improving Birth Outcomes in West Virginia

Background

For more than 30 years, guidelines for perinatal regionalization have recommended that very low birth weight [VLBW] infants be born at highly specialized hospitals, most commonly designated as level III hospitals. Despite these recommendations, some regions continue to have large percentages of VLBW infants born in lower-level hospitals[1, 2].

VLBW babies are those with birth weights less than 1500 grams which is approximately 31 weeks gestation. The American Academy of Pediatrics policy statement on neonatal care states that only Level III hospitals should care for infants less than 32 weeks gestation[3].

Since 1990, the Healthy People Objectives for 2000, 2010, and 2020 have included the goal: to ***increase the proportion of very low birth weight (VLBW) infants born at level III hospitals or subspecialty perinatal centers to 90.0 percent[4].***

In 2008 the National Quality Forum (NQF) endorsed a series of 17 quality measures for perinatal care. One of these quality measures states that infants less 1500g should be delivered at a hospital with a Neonatal Intensive Care Unit[5].

Recent Research

Much research has demonstrated the benefits of delivering high-risk infants in settings that have the technological capacity to care for them. Specifically, research has shown that VLBW infants have lower death and morbidity rates when they are delivered at level III hospitals, which are equipped to care for very small infants. To ensure that high-risk pregnant women have access to appropriate levels of obstetric care, many states have implemented perinatal regionalization strategies and protocols for the transfer of high-risk women to level III facilities (for delivery). Evidence, however, indicates that these systems may be eroding as health care networks and financing systems change. The proportion of VLBW infants who are delivered in the level III obstetric hospitals best equipped to provide appropriate neonatal care should be measured to monitor the continuing effectiveness of these systems and the appropriateness of the level of care delivered to high-risk pregnant women and infants[6].

In 2010, researchers from CDC/DRH, the Rollins School of Public Health, Emory University, and the University of Maryland, School of Medicine conducted a meta-analysis of published research on *risk-appropriate* care in the US. The major finding from this work indicates that VLBW and very preterm

---

[1] *Medscape Medical News* (Lowry, F. Preemies Not Born in Specialized Level III Hospitals More Likely to Die) http://www.medscape.com/viewarticle/727799

[2] Committee on Perinatal Health. Toward improving the Outcome of Pregnancy: Recommendation for the Regional Development of Maternal and Perinatal Services. White Plains, NY: March of Dimes National Foundation, 1976.

[3] Committee on Fetus and Newborn, **Levels of Neonatal Care**, Pediatrics 2004 114: 1341-1347

[4] http://www.cdc.gov/nchs/data/hp2000/hp2k01.pdf

[5] National Quality Forum (NQF). *National Voluntary Consensus Standards for Perinatal Care 2008: A Consensus Report.* Washington, DC: NQF; 2009.

[6] http://www.healthypeople.gov/document/html/volume2/16mich.htm#_edn52

infants born outside of level III hospitals are at an increased likelihood of neonatal death or death prior to discharge from the hospital[7].

The results of this review confirm a primary premise on which perinatal regionalization systems are based: ***high risk infants have higher mortality rates when born outside hospitals with the most specialized levels of care, the authors conclude.*** Although they represent less than 2% of U.S. births, 55% of infant deaths occur among VLBW infants. Strengthening perinatal regionalization systems in states with high percentages of VLBW and very preterm (VPT) infants born outside of level III centers could potentially save thousands of infant lives every year[8].

In 2007, VLBW births in West Virginia represented only 1.6% of all births, but they accounted for 43.6% of <u>all</u> infant deaths.

Place of Birth of VLBW Infants Born in WV between 2000 and 2009

This report explores the occurrence of babies less than 1500 grams born at West Virginia Hospitals without regard to residence states of mothers. Improving the number of very low birth weight babies born at Level III hospitals may improve the infant mortality rate among babies who are born in West Virginia hospitals. This report does not explore the numbers of VLBW West Virginia babies born at out of state hospitals and it does not explore the infant mortality rates at individual hospitals.

The graphs and charts on the following pages were developed with the assistance of Gary L. Thompson, State Registrar of Vital Statistics and Tom Light of the WV Health Statistics Center using the standard measurement formula:

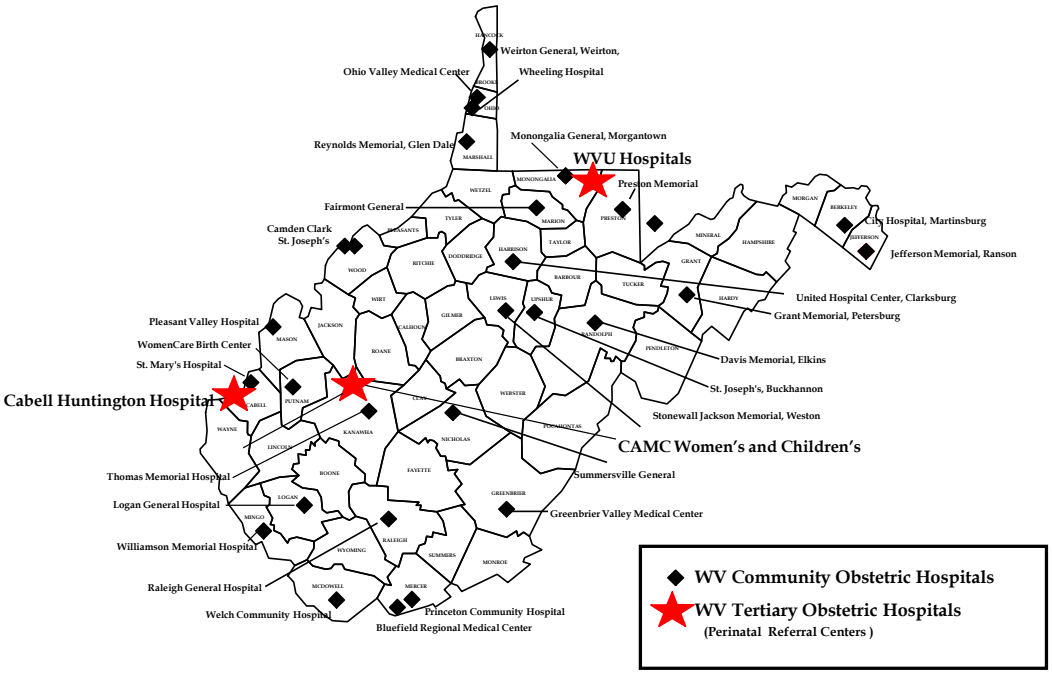
$$\frac{\#\ <1500\ \text{gram infants born at Level III facilities}}{\text{Total}\ \#\ <1500\ \text{gram infants born}} \times 100$$

NOTE: Less than ten percent of VLBW babies should be born at non-Level III hospitals. The green lines on some of the charts are placed so the reader can easily see the percentages of birth occurrences that are not achieving the goal.

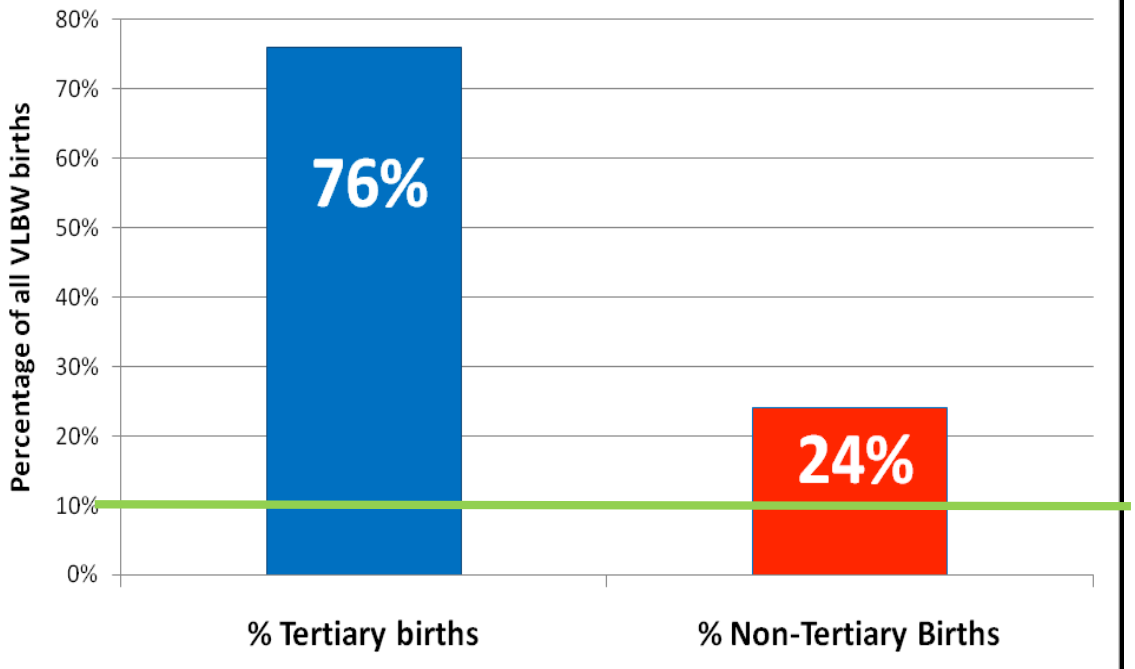
[7] *Journal of the American Medical Association* (Lasswell SM, Barfield WD, Rochat RR, Blackmon LR. Perinatal Regionalization for Very Low-Birth-Weight and Very Preterm Infants—A Meta-analysis, *JAMA* 2010; 304.9: 992-1000).

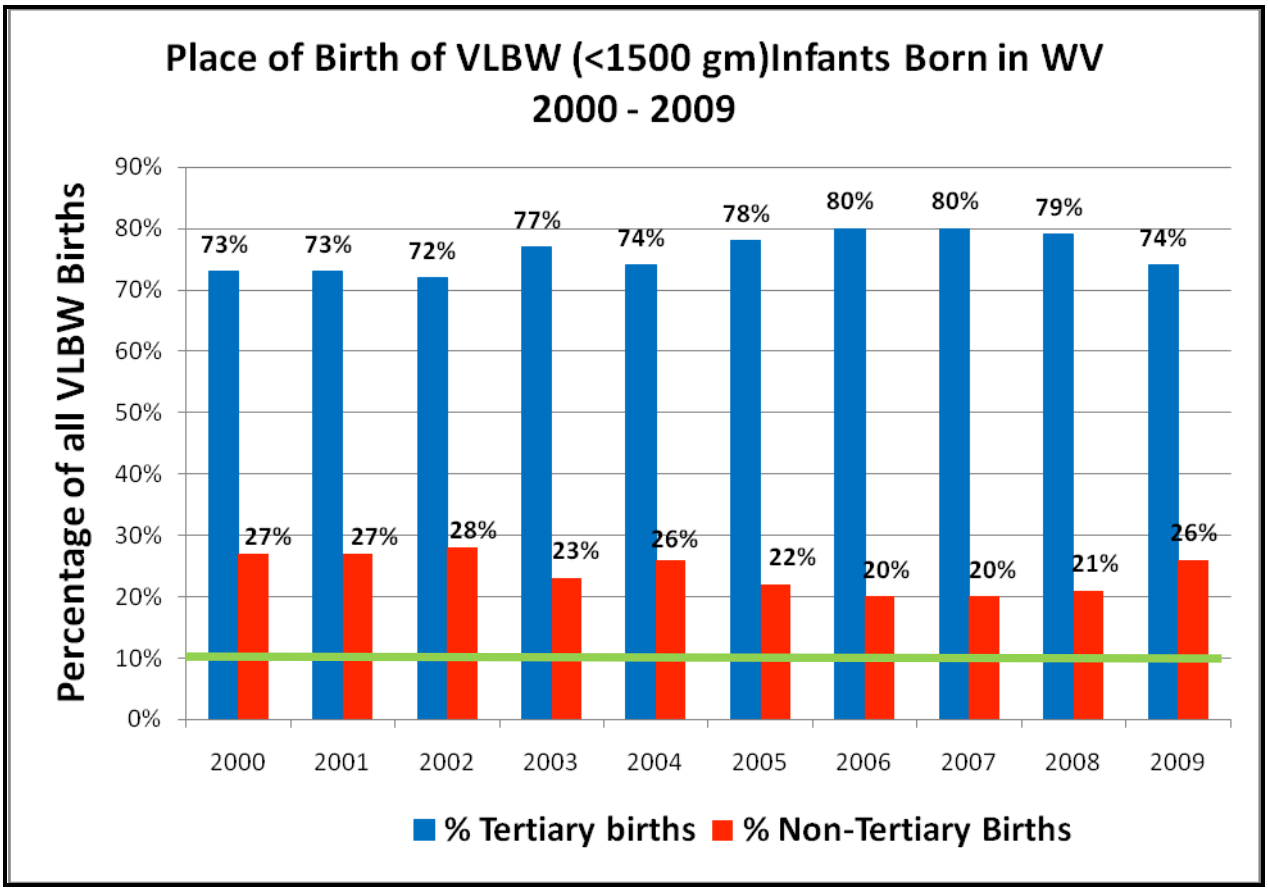
[8] *Medscape Medical News* (Lowry, F. Preemies Not Born in Specialized Level III Hospitals More Likely to Die) http://www.medscape.com/viewarticle/727799

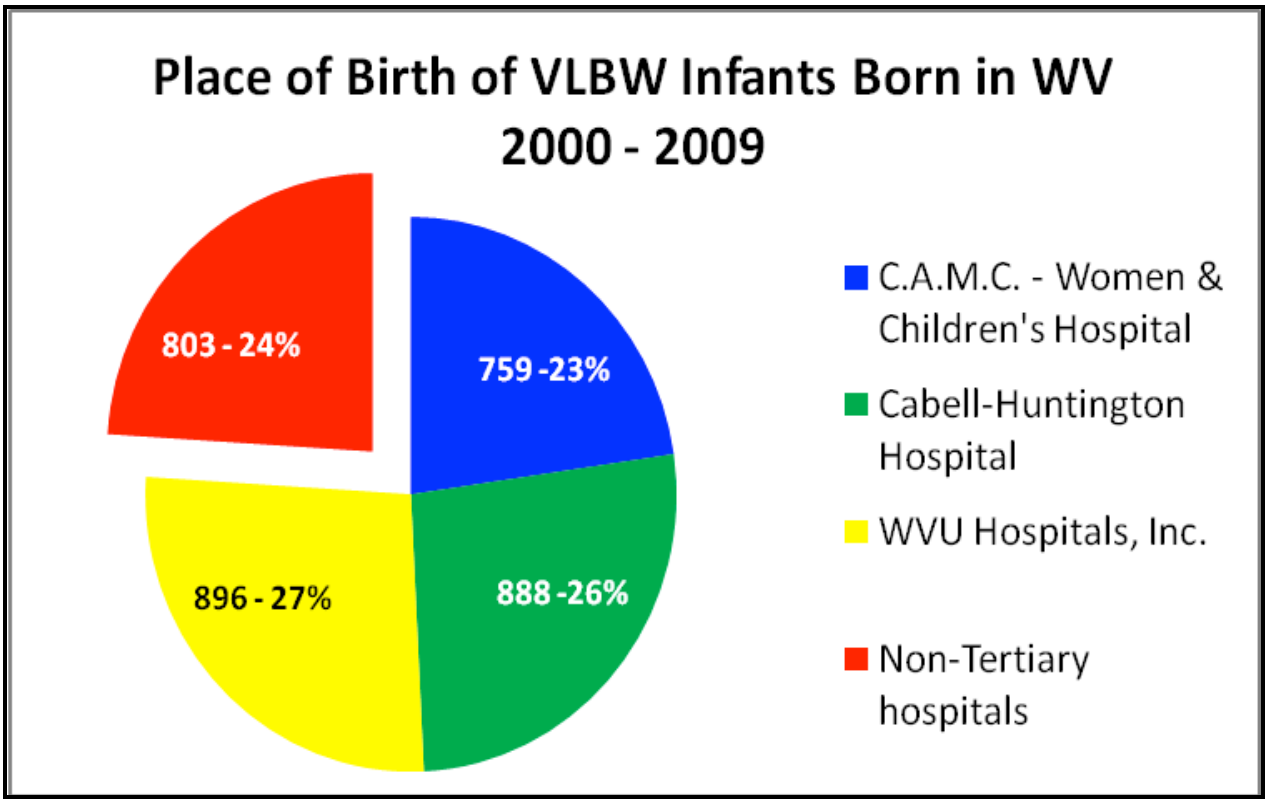
Locations of WV Birthing Facilities, 2010

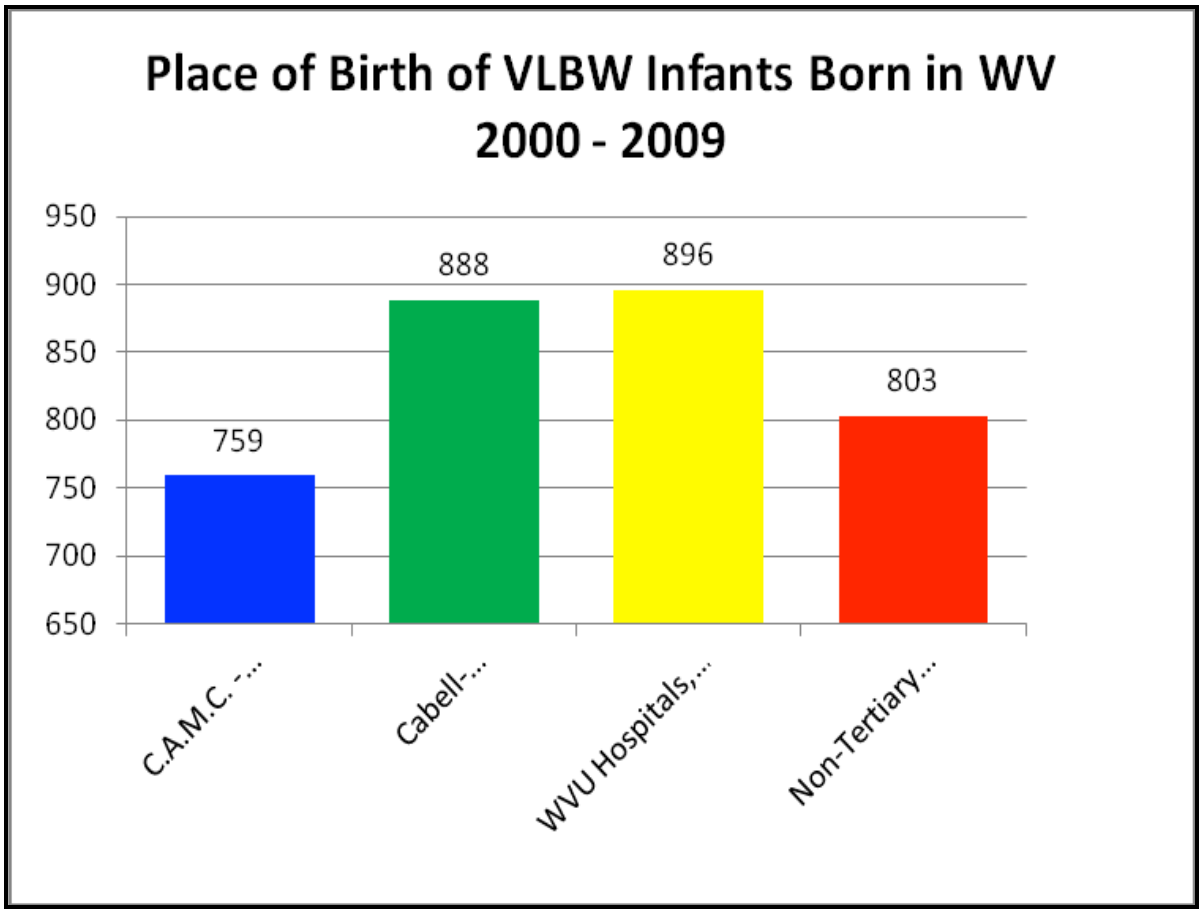


Place of Birth of VLBW Infants Born in WV 2000 - 2009




Place of Birth of VLBW (<1500 gm)Infants Born in WV
2000 - 2009
Percentage of all VLBW Births
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
73%
73%
72%
77%
74%
78%
80%
80%
79%
74%
27%
27%
28%
23%
26%
22%
20%
20%
21%
26%
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
% Tertiary births
% Non-Tertiary Births

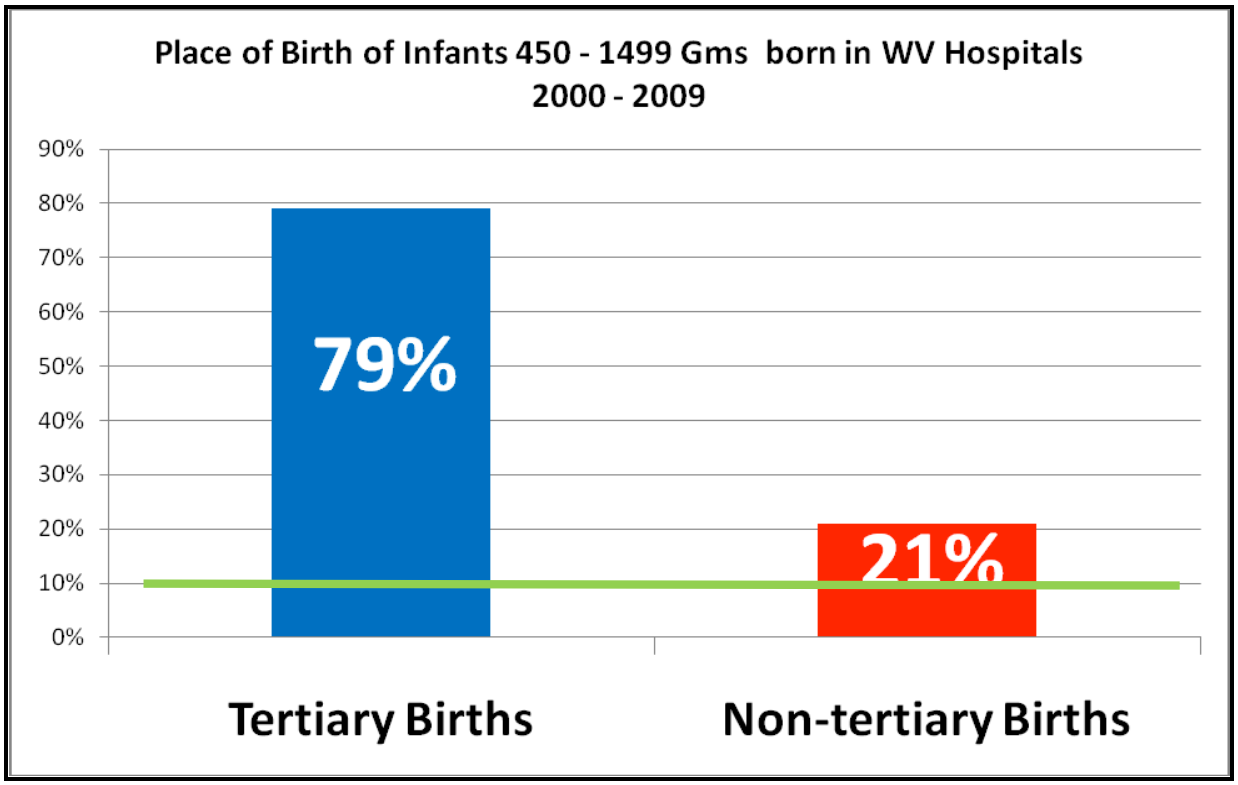

Place of Birth of VLBW Infants Born in WV
2000 - 2009
803 - 24%
759 -23%
896 - 27%
888 -26%
C.A.M.C. - Women & Children's Hospital
Cabell-Huntington Hospital
WVU Hospitals, Inc.
Non-Tertiary hospitals

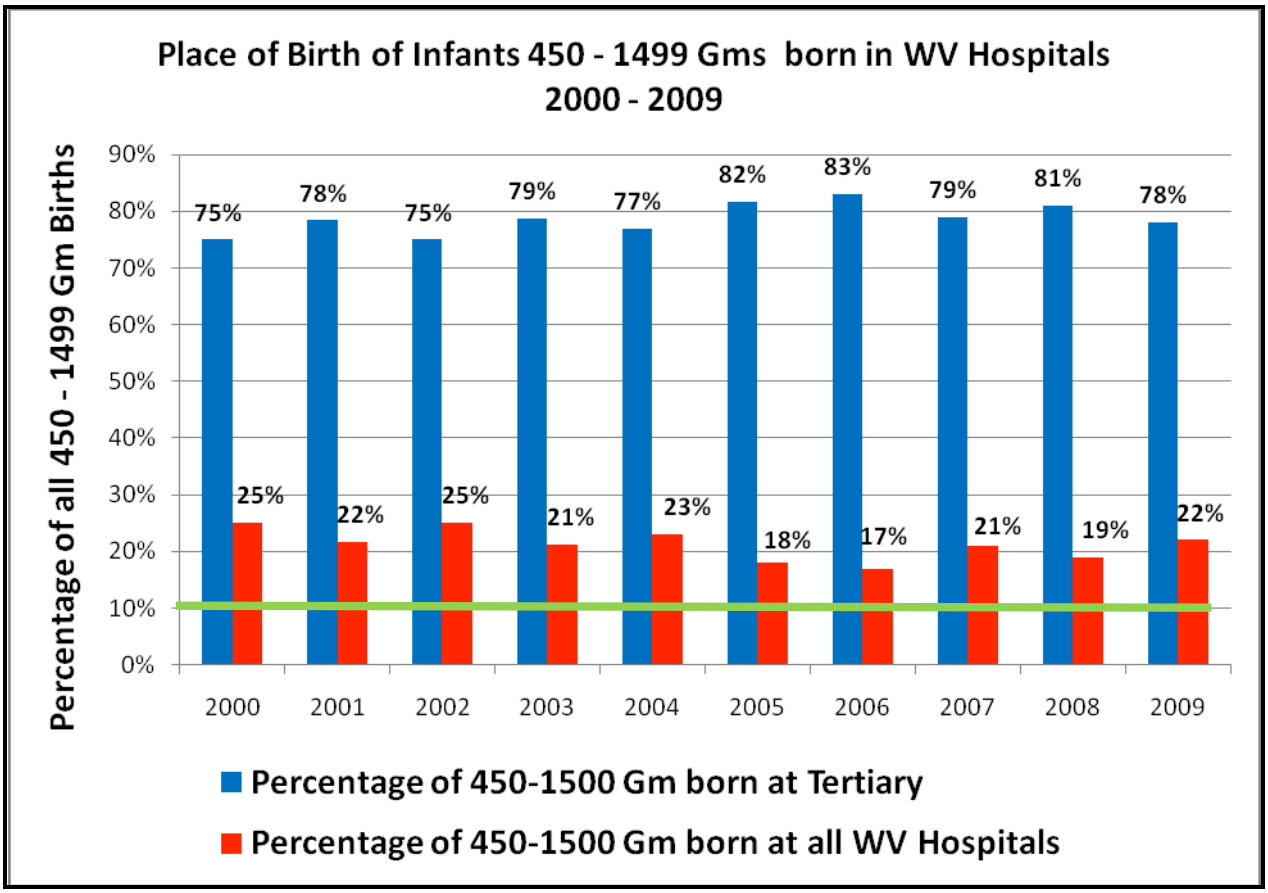


Place of Birth of VLBW 450 – 1499 Gram Infants Born in WV between 2000 and 2009

To account for the argument that mothers may not have been transported because of very early gestational age the following graphs and charts were developed using the modified measurement formula below. Graphs of these births follow. (Neonatal resuscitation indicators for infant resuscitation now include infants more than 23 weeks and birth weight more than 400 grams.)

$$\frac{\text{\# 450 - 1499 gram infants born at Level III facilities}}{\text{Total \# 450 - 1499 gram infants born}} \times 100$$


Place of Birth of Infants 450 - 1499 Gms born in WV Hospitals
2000 - 2009
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
79%
21%
Tertiary Births
Non-tertiary Births


Place of Birth of Infants 450 - 1499 Gms born in WV Hospitals
2000 - 2009
Percentage of all 450 - 1499 Gm Births
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
75%
25%
78%
22%
75%
25%
79%
21%
77%
23%
82%
18%
83%
17%
79%
21%
81%
19%
78%
22%
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Percentage of 450-1500 Gm born at Tertiary
Percentage of 450-1500 Gm born at all WV Hospitals

Discussion

It is clear from these statistics that West Virginia is not achieving the goal of 90% of very low birth weight babies being born at tertiary care centers. West Virginia has three Level III or tertiary care centers but only one of them has a maternal transport team. There is no statewide Maternal Transport Team available to all community hospitals in West Virginia. Therefore it is difficult to get mothers to Level III facilities if they are in preterm labor or have a medical problem that requires delivery of an infant less than 1500 grams.

West Virginia's three Tertiary Care centers are located at teaching hospitals in Charleston, Huntington, and Morgantown and each is associated with a school of medicine. Huntington's tertiary care center is located at Cabell-Huntington Hospital and affiliated with Marshall University School of Medicine. Charleston's tertiary care center is located at CAMC Women and Children's Hospital and affiliated with WVU School of Medicine. Morgantown's tertiary care center is located at WVU Children's Hospital and also affiliated with WVU School of Medicine's main campus.

Each of West Virginia's tertiary perinatal centers has 24-hour perinatal consultation, a high-risk prenatal clinic, a high-risk labor and delivery unit, a neonatal intensive care unit, and a 24-hour neonatal transport team. Neonatal transport teams travel from the tertiary care centers to referring hospitals to stabilize and transport sick babies to their NICUs. Neonatal transport teams have been in place at the three tertiary care centers since the mid-1970s.

In addition to their neonatal transport team, Cabell-Huntington Hospital has had a maternal transport team in place continuously since 1977 utilizing both ground and air transport. Similar to the neonatal transport teams, Cabell-Huntington Hospital's maternal transport team travels to referring hospitals to assess and transport the high risk mothers back to its labor and delivery floor. The other two Level III centers do not have maternal transport teams and referring hospitals have to rely on community ambulance services and their own RNs to transport mothers. Administrators at the other two tertiary centers have cited cost as the factor which prohibits them from deploying a maternal transport team.

To achieve the national goal at least 90% of West Virginia births occurring in Level III Tertiary Care Centers, WV leaders need to examine statistics more closely to evaluate why more of these high-risk infants are not being delivered at Level III hospitals. Obstacles to maternal transport need to be studied. Consideration must be given to implementing a quality assurance measure for hospitals to improve and/or meet this objective. A cost/benefit analysis of should be considered. A good start would be a Quality Improvement Initiative asking non-tertiary hospitals to review all births of infants less than 1500 grams that occur at their facilities. This is a quality improvement indicator suggested by the American Academy of Pediatrics in *Guidelines for Perinatal Care*[9].

[9] ***Guidelines for Perinatal Care,*** 6th Edition, co-published and endorsed by the American Academy of Pediatrics and American College of Obstetricians and Gynecologists. 2007.

Recommendations

Background information for many of the recommendations in this section was outlined by the *Subcommittee on Perinatal Consultation, Transport, and Outreach Education* of the 2007 Perinatal Partnership. The full report is available on the partnership's website[10].

The West Virginia Perinatal Partnership 2010 study of place of delivery of Very Low Birth Weight Babies found that the State has not yet met the goal set in 1990 that at least 90% of VLBW infants should be born in qualified tertiary facilities. To reach this goal, it is proposed that the Perinatal Partnership initiate a VLBW Quality Initiative project. This initiative would include the following Partner organizations and professionals:

Non-tertiary perinatal hospitals and providers
Tertiary perinatal hospitals and providers
State Government Organizations

- Health Statistics Center, WV Bureau for Public Health
- Office of Maternal Child and Family Health (OMCFH)
- State Trauma and Emergency Medical System (STEMS)
- WV Health Care Authority (WVHCA)
- Representatives of WV Legislature, Legislative Oversight Commission on Health and Human Resources Accountability.
- WV March of Dimes (WVMOD)

Very Low Birth Weight Quality Initiative Proposal

Goal I: to meet the goal set in 1990 by Healthy People 2000 to increase the proportion of very low birth weight (VLBW) infants born at level III hospitals or subspecialty perinatal centers to 90 percent. Between 2000 and 2009 only 76% of VLBW infants were born in Level III hospitals. In 2009 only 74% VLBW babies were born in Level III hospitals.

VLBW babies are those with birth weights less than 1500 grams which is approximately 31 weeks gestation. The American Academy of Pediatrics policy statement on neonatal care states that only Level III hospitals should care for infants less than 32 weeks gestation[11].

1. Study incidence of where VLBW babies are born
2. Study mortality difference of location of birth
3. Study cost difference of location of birth
4. Study needs of non-tertiary hospitals
    a. Ask all non-tertiary hospitals to review care of all mothers who gave birth to infants <1500 grams
        i. How long was the mother at the non-tertiary hospital before she gave birth to a baby weighing less than 1500 grams?
        ii. Was there an attempt to transport the mother?
5. If so what factors prevented her transport?
    a. Study factors would help non-tertiary hospitals improve their rate of maternal transfer
6. Identify the barriers to maternal transports recognized at community hospitals.
7. Identify the barriers to maternal transports recognized at tertiary centers.
8. Study intent for maternal transport

[10] http://wvperinatal.org/transport.htm
[11] Committee on Fetus and Newborn, **Levels of Neonatal Care**, Pediatrics 2004 114: 1341-1347

    a. Provide all non-tertiary hospitals transport log books to hospitals for tracking of maternal and newborn transports including attempts to transport.
9. Educate providers on importance of transporting mothers to tertiary centers
    a. Encourage non-tertiary providers to consider maternal transport at the limits of viability when the question of infant viability is unknown (i.e. 23 – 25 weeks gestation)
    b. Develop guidelines for medical consultation for tertiary providers who provide support to non tertiary providers considering maternal transport.
    c. Design and put into place a process so that referring providers receive regular updates and information on mothers and babies that they have transferred to a tertiary center.
    d. Design and put into place a process so that obstetric providers receive regular information on the health status of the infants born after mothers have been transported to tertiary centers.
10. Establish method and process for ongoing measure and review of progress toward goal.

Goal II: To assure that infants are cared for in the most appropriate medical setting as close to the infants family home community - to allow for family bonding, education of family on caring for infant, and for reattachment to infants' medical care providers within his/her home community for continuous follow-up care.

1. Establish a referral process for tertiary providers to transport mothers and babies back to referring hospitals when the need for tertiary care has passed
    a. Study the policies that need to be put into place so that babies are returned appropriately closer to home
    b. How do we build the capacity of community hospitals to care for the infant once it is eligible for less than NICU care
    c. Study educational needs for staff at those hospitals that have agreed to take babies back for convalescent care after NICU admissions.
    d. Study payment and or policy issues that keep the infant from reverse transfer?
2. Establish method and process for ongoing measure and review of progress toward goal.