Late Preterm Births in Virginia

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Executive Summary: This report examines late preterm births in Virginia, drawing on data from 2018 to April 2024 sourced primarily from the CDC Wonder system. The findings highlight significant disparities in late preterm birth rates among racial groups, with Black Non-Hispanic populations experiencing higher rates than their White Non-Hispanic counterparts. Additionally, the analysis reveals that late preterm births frequently fall within the threshold for low birth weight, indicating a potential need for advanced medical intervention. Geographical variations in late preterm birth rates across Virginia's regions stress the importance of region-specific strategies and interventions. Pregnancy risk factors and abnormal conditions of the newborn emerge as notable comorbidities associated with late preterm births. Moreover, adverse outcomes stemming from cesarean deliveries and birth inductions are prevalent considerations in this context. Ongoing monitoring of these trends is essential for informing and evaluating the effectiveness of interventions aimed at reducing disparities and enhancing overall health equity.

Background

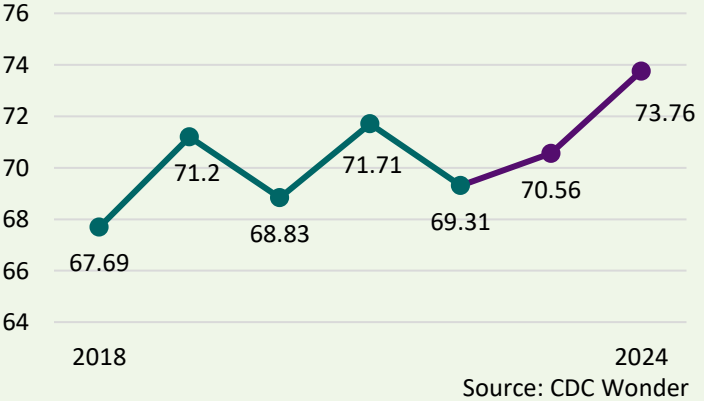
- Late preterm infants are those born between $34^{0/7}$ and $36^{6/7}$ weeks of gestational age, and they are the fastest-growing subset of neonates.[3]
- From 2018 to April 2024, late preterm births accounted for over 72% of all preterm births in Virginia, and about 7% of all births.[1]
- Main reasons for late preterm births include spontaneous preterm labor and/or spontaneous rupture of placental membranes.[2]
- Maternal risk factors for late preterm births include obesity, fertility treatments, multiple gestations, chronic comorbidities, and increasing maternal age.[3]
- Risk of infant mortality in late preterm births is higher than term births, but still much lower than extreme preterm infants, leading to late preterm infants often being overlooked in the hospital.[2]

Methods

The primary data source used in this report is the CDC Wonder system.[1] This site contains publicly accessible vital records (births and deaths) data that can be stratified and extracted to support health research. The data are from the Natality and Mortality Records for the period from 2018 to April 2024, as compiled from information provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Data from 2018-2022 are finalized, while data from 2023 to April 2024 are preliminary and subject to future changes. Additionally, inpatient discharge data were used to illustrate the geography of late preterm births in Virginia from 2018 to 2023.[8]

Preliminary data showing that late preterm birth rates are rising in 2024.

Late preterm birth rate per 1,000 live births.



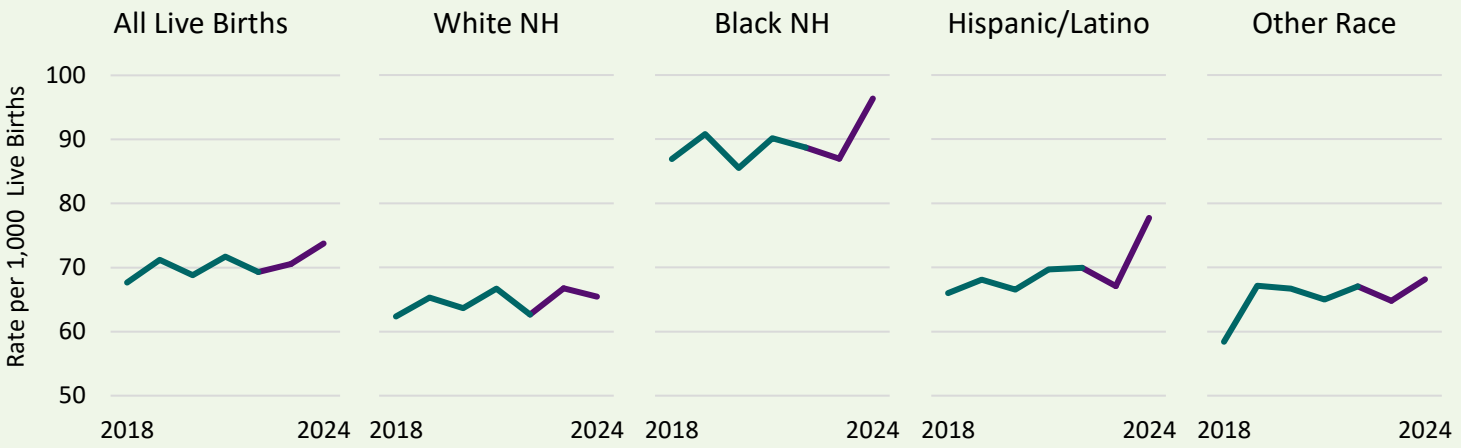
Source: CDC Wonder

*Preliminary data subject to change. 2024 data is not representative of a full calendar year, and analysis should be interpreted with caution.

Race

Most recent data show that late preterm births have the highest incidence in the black population in 2024 through April.

Late preterm birth rate per 1,000 live births, 2018 – April 2024.



*Preliminary data subject to change. 2024 data is not representative of a full calendar year, and analysis should be interpreted with caution.

Source: CDC Wonder

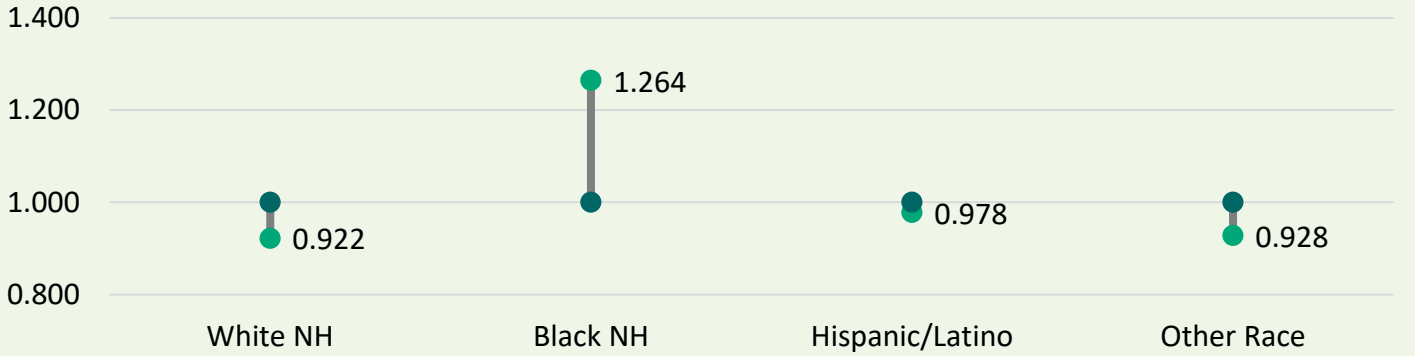
In Virginia, late preterm birth rates are notably higher among the Black Non-Hispanic (NH) population. From 2018 to April 2024, the overall incidence rate of late preterm births increased by approximately 8.96%, reaching 73.76 per 1,000 live births. The Black NH population experienced a more substantial rise of 10.86%, with rates climbing from 86.89 to 96.33 per 1,000 live births. In contrast, White NH births saw a 4.98% increase, from 62.36 to 65.47 per 1,000 live births.

Relative risk analysis reveals a 26.39% higher likelihood of late preterm births among the Black NH population, with a relative risk of 1.264 compared to the general population. Conversely, the White NH population has a 7.75% lower likelihood of late preterm births, with a relative risk of 0.922. Notably, Black births also exhibit a 37.02% higher risk of late preterm birth compared directly to just White births. Additionally, Hispanic/Latino and other race births demonstrate slightly lower risks for late preterm births than the total population.

These data suggest a need for targeted interventions and enhanced support mechanisms to address these disparities. The trends observed in Virginia mirror patterns in maternal and infant health across the United States, underscoring the necessity of monitoring and addressing the socioeconomic factors impacting health outcomes. Implementing strategies to reduce these disparities is crucial for improving overall maternal and infant health.

Black Non-Hispanic is the only racial group with an increased risk for late preterm births.

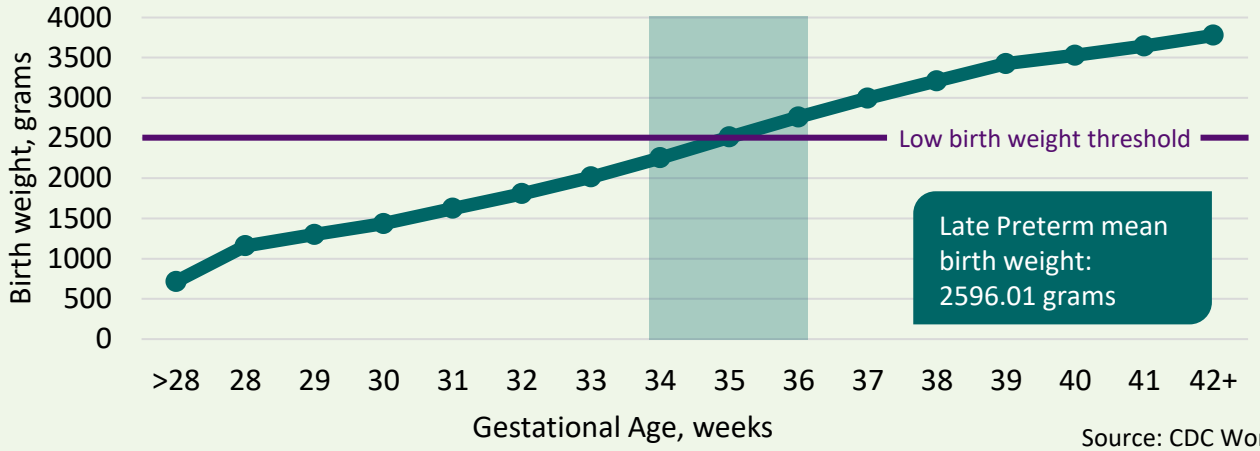
Relative risk for preterm birth by race, 2018 - April 2024.



Source: CDC Wonder

Late preterm births fall within the threshold for low birth weight.

Average birth weight by gestational age, 2018 – April 2024.
Late preterm births highlighted, 34-36 weeks.



Source: CDC Wonder

Premature birth is a leading risk factor for low birth weight, which is associated with a range of complications after birth, including low oxygen levels, feeding problems, infections, and respiratory distress.[6] The World Health Organization (WHO) defines "low birth weight" as infants with a birth weight of less than 2500 grams.[9]

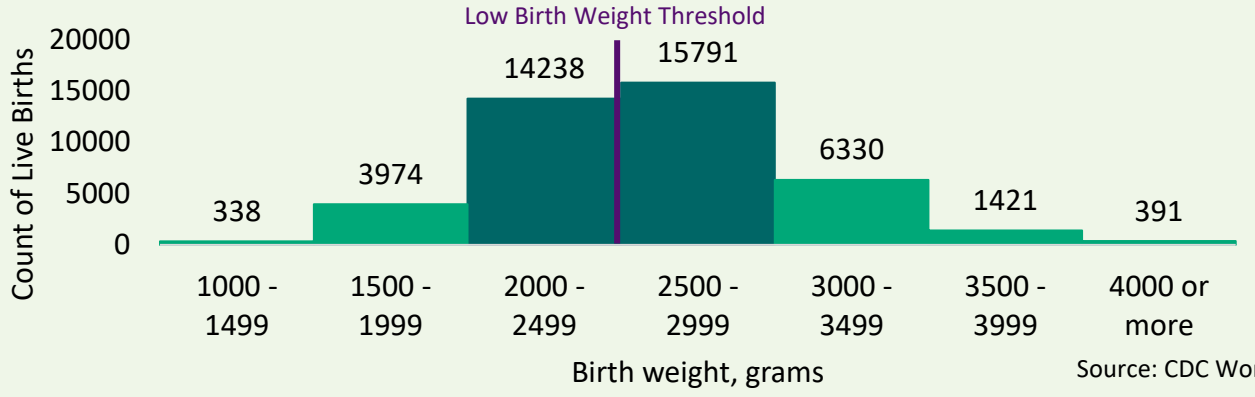
The first graph, above, illustrates the mean birth weight based on gestational age in weeks. It clearly demonstrates an upward linear relationship between birth weight and gestational age. The shaded region highlights gestational ages 34-36 weeks, marking the late preterm birth period. Late preterm births fall within the 2500-gram threshold for low birth weight, with the mean birth weight for late preterm births in Virginia from 2018 to April 2024 being 2596.01 grams.

The second graph, below, shows the weight distribution of late preterm births from 2018 to April 2024. The majority of late preterm births in Virginia fall between 2000 and 2999 grams. A significant proportion of these births fall both above and below the low birth weight cutoff. In fact, 43.66% of late preterm births can be classified as "low birth weight" per the WHO definition. This indicates the need for medical intervention for this cohort. Additionally, the substantial proportion of late preterm births that occur at a healthy weight may lead to hospitals overlooking these infants as potentially high-risk.

These trends highlight the importance of continued monitoring and tailored medical care for late preterm infants, ensuring that both low and healthy weight infants receive appropriate attention and intervention.

The majority of late preterm births have a birth weight between 2000 and 2999 grams.

Weight distribution for late preterm births, 2018 - April 2024.

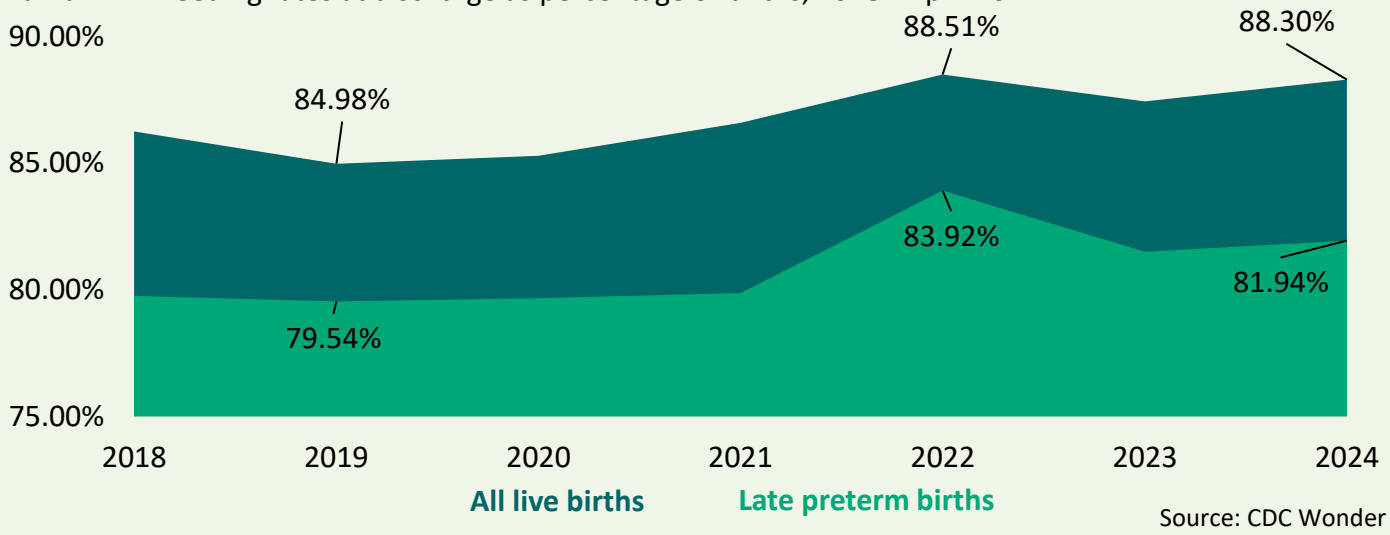


Source: CDC Wonder

Human Milk Feeding & Mortality

Human milk feeding rates are lower in late preterm births.

Human milk feeding rates at discharge as percentage of births, 2018 - April 2024.



Source: CDC Wonder

Human milk plays a vital role in the health and development of infants. Not only does it provide optimal nutrition, but it also contains important bioactive components, including essential hormones, pro- and prebiotics, antibodies, and many other elements crucial for infant development.[5] These components help set infants up for future success, with effects that can influence adolescence and even adulthood.

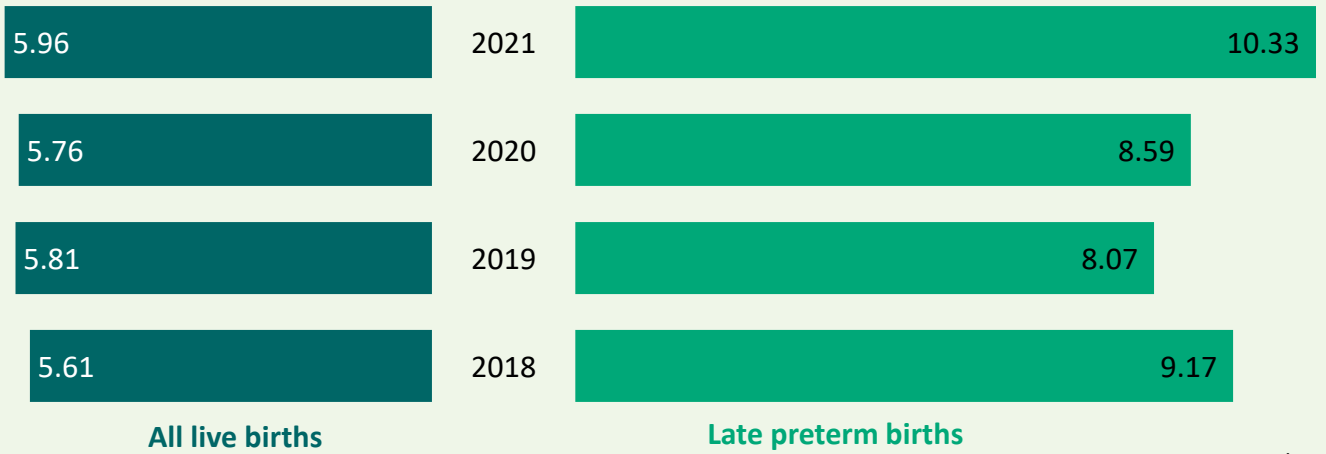
Late preterm infants need human milk as much as any other infant, yet data shows they receive lower rates of human milk feeding compared to the total population. The vital records data do not specify whether this feeding was exclusively human milk or the intended duration of milk feeding. Since 2018, human milk feeding rates have been increasing in both the total and late preterm populations.

The data also illuminated differences in infant mortality between the total population and late preterm births. From 2018 to 2021, late preterm births experienced nearly twice the rate of the overall infant mortality rate in all live births. This indicates that late preterm infants have an above average likelihood to face complications, abnormal conditions, and congenital anomalies.

Infant mortality reflects the combined impact of various factors, including maternal health, quality of and access to medical care, socioeconomic conditions, and public health practices. Late preterm infants are particularly vulnerable, and they often require specialized care. Addressing the needs of late preterm infants through targeted healthcare interventions can significantly improve their survival rates and long-term health outcomes.

Infant mortality is nearly double in late preterm births.

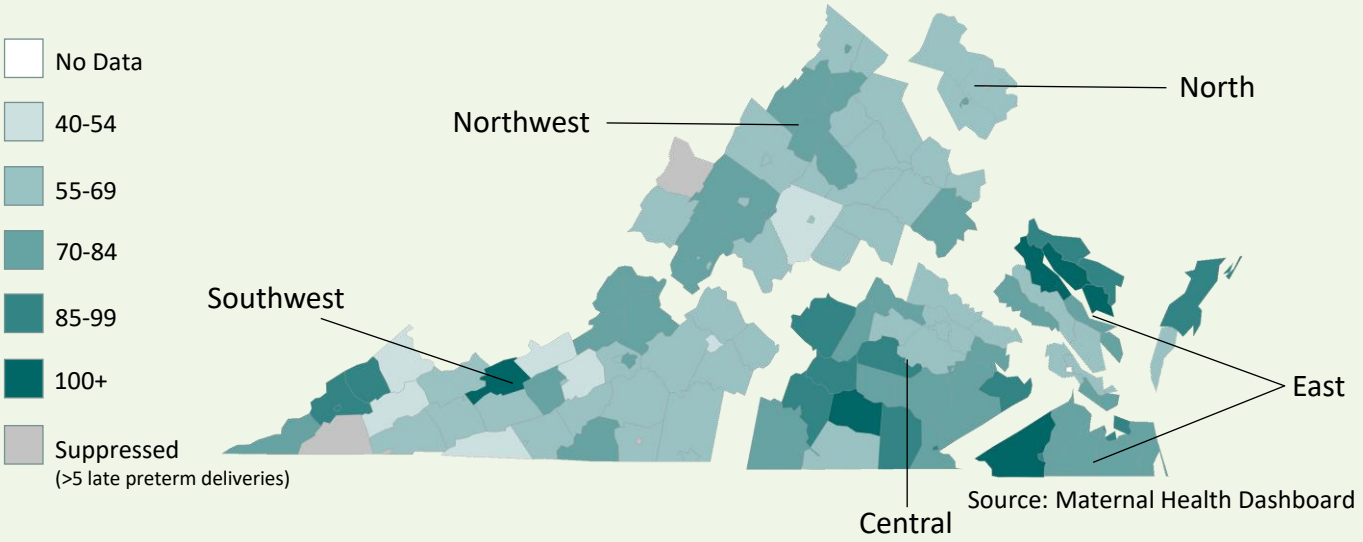
Infant mortality rate per 1,000 live births, 2018-2021.



Source: CDC Wonder

Geography

Incidence rates for late preterm births per 1,000 hospital deliveries, 2018-2023.



Source: Maternal Health Dashboard

Data on geographical differences in late preterm births were obtained from inpatient discharge data through the maternal health dashboard.[8] This dashboard, a collaborative tool used by the Virginia Neonatal Perinatal Collaborative (VNPC) and the Virginia Hospital and Healthcare Association (VHHA), helps identify perinatal trends. Unlike vital records data, which measure the population by live births, this data measures hospital deliveries, where each record represents a single birthing woman rather than a live-born infant.

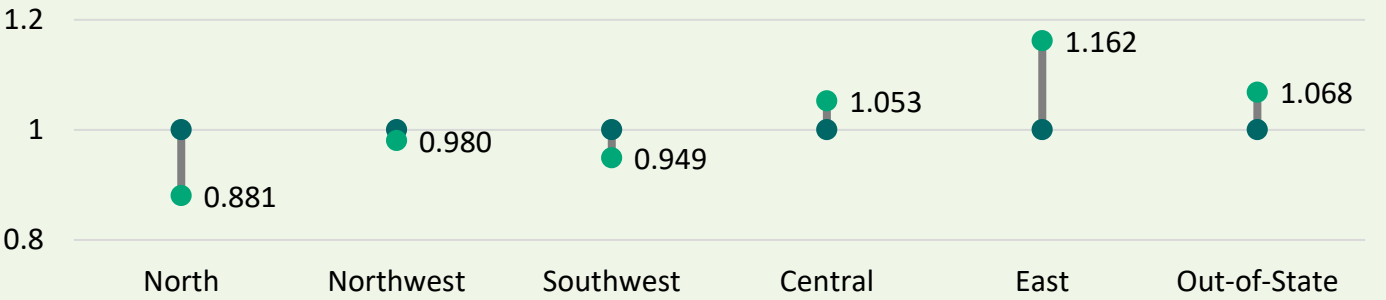
Virginia is divided into five main health planning regions as defined by the Virginia Department of Health (VDH, 2024). The map above highlights incidence rates for late preterm births per 1,000 hospital deliveries, shown by localities (counties and independent cities) with VDH regions floating. The map indicates that Central and East Virginia have the highest density of high incidence rates.

A relative risk analysis from 2018 through 2023 supports these trends. The Eastern region has the highest risk for late preterm births, being 16% more likely to experience a late preterm birth compared to the total population (relative risk of 1.162). The Central region follows, with a 5% higher likelihood of late preterm births (relative risk of 1.053). Conversely, the North, Northwest, and Southwest regions have lower risks of late preterm births than the total population. Specifically, the Northern region is about 12% less likely to have a late preterm birth (relative risk of 0.881).

These geographical differences stress the need for region-specific strategies and interventions to address the higher risks of late preterm births in Central and East Virginia. Monitoring these trends is essential for improving maternal and infant health outcomes across the state.

Northern Virginia has the lowest risk, and Eastern Virginia Has the highest risk for late preterm birth.

Relative risk for preterm birth by region, 2018 - 2023.

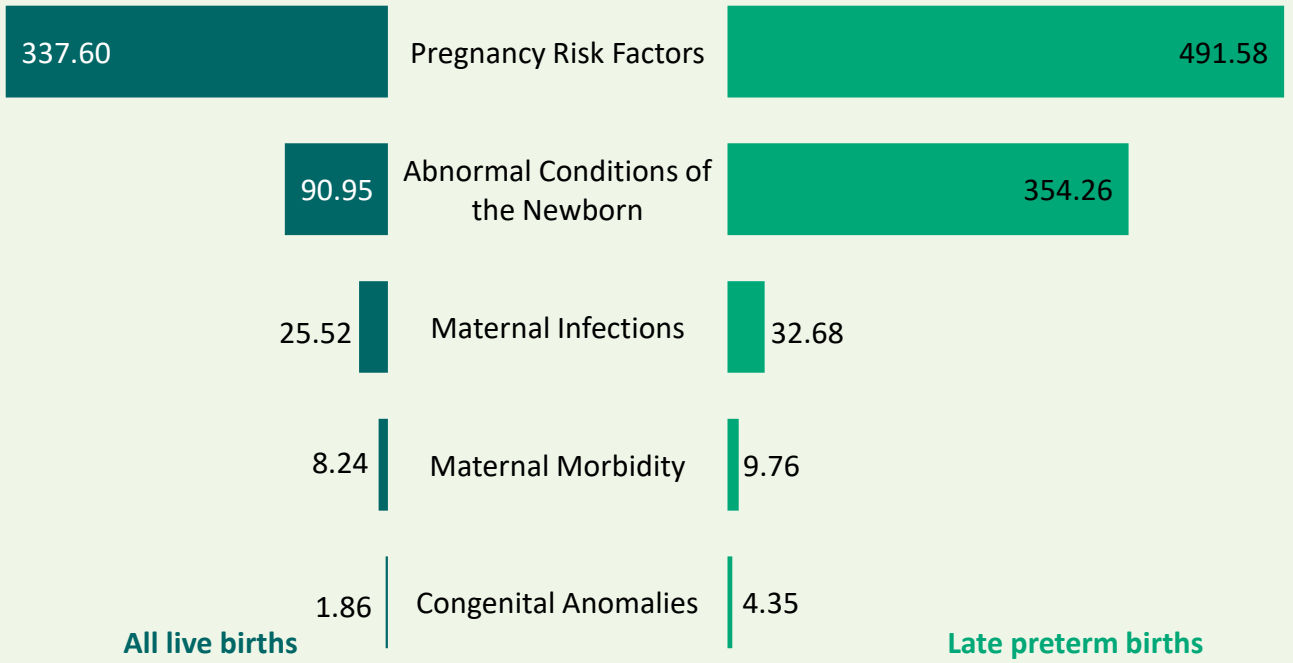


Source: Maternal Health Dashboard

Risk Factors

Pregnancy Risk Factors and Abnormal Conditions of the Newborn are the most frequent comorbidities with late preterm births.

Comorbidity rates per 1,000 live births, 2018 – April 2024.



Source: CDC Wonder

When considering the causes of late preterm births, it is important to account for the myriad of potential risk factors and comorbidities. The chart above illustrates the differences in comorbidity rates between all live births and late preterm births. The data show a significant increase in pregnancy risk factors and abnormal conditions of the newborn in late preterm births compared to all live births.

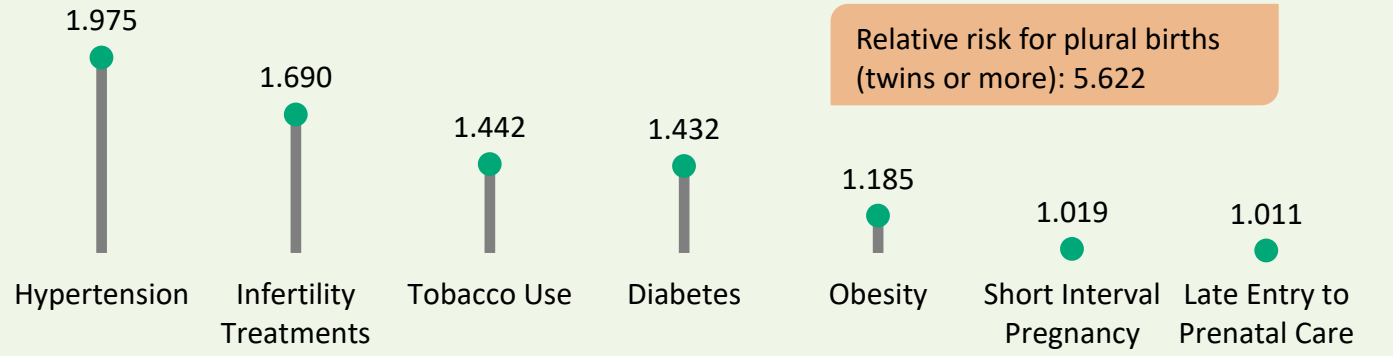
Pregnancy risk factors include conditions such as diabetes (pre-pregnancy and gestational), hypertension (pre-pregnancy and gestational), eclampsia, previous preterm births, use of infertility treatments, fertility-enhancing drugs, assistive reproductive technology, and previous cesarean deliveries. Detailed analysis further highlighting the differences between these risk factors is provided on the next page. Pregnancy risk factors are prevalent in nearly half of all late preterm births, with 491.58 per 1,000 live births being flagged. This represents a 45.6% increase from the rate observed in all live births, underscoring the importance of considering maternal factors when focusing on quality improvement projects for late preterm births.

Additionally, abnormal conditions of the newborn emphasize the need to consider neonatal factors in quality improvement projects for late preterm births. These conditions include assisted ventilation, assisted ventilation for more than six hours, NICU admission, surfactant replacement therapy, antibiotics for suspected neonatal sepsis, and seizures. An analysis depicting the differences is also featured on the next page. Abnormal conditions of the newborn occur at a much higher rate in late preterm births compared to all live births, with a 289.51% increase in prevalence from 90.95 per 1,000 live births to 354.26 per 1,000 live births. Nearly 40% of late preterm births are comorbid with at least one of these conditions.

The remaining risk factors, including maternal infections, maternal morbidity, and congenital anomalies, do not show the same magnitude of prevalence as pregnancy risk factors and abnormal conditions of the newborn. However, each of these three risk factors still occurs at higher rates in late preterm births compared to all live births. While not as significant, these factors may still be important to consider for improvement activities relating to late preterm births.

Outside of plural births, Gestational Hypertension is associated with the higher risk for a late preterm birth.

Relative risk for late preterm birth by pregnancy risk factors, 2018 - April 2024.



Source: CDC Wonder

As shown in the previous analysis, pregnancy risk factors significantly correlate with the increased incidence of late preterm births. The above graph illustrates several pregnancy risk factors analyzed through relative risk analysis. These factors include gestational hypertension, infertility treatment, tobacco use, gestational diabetes, pre-pregnancy obesity, short interval pregnancy (4-24 months since the last live birth), late entry to prenatal care (first visit in the second trimester), and plural births (twins or more).

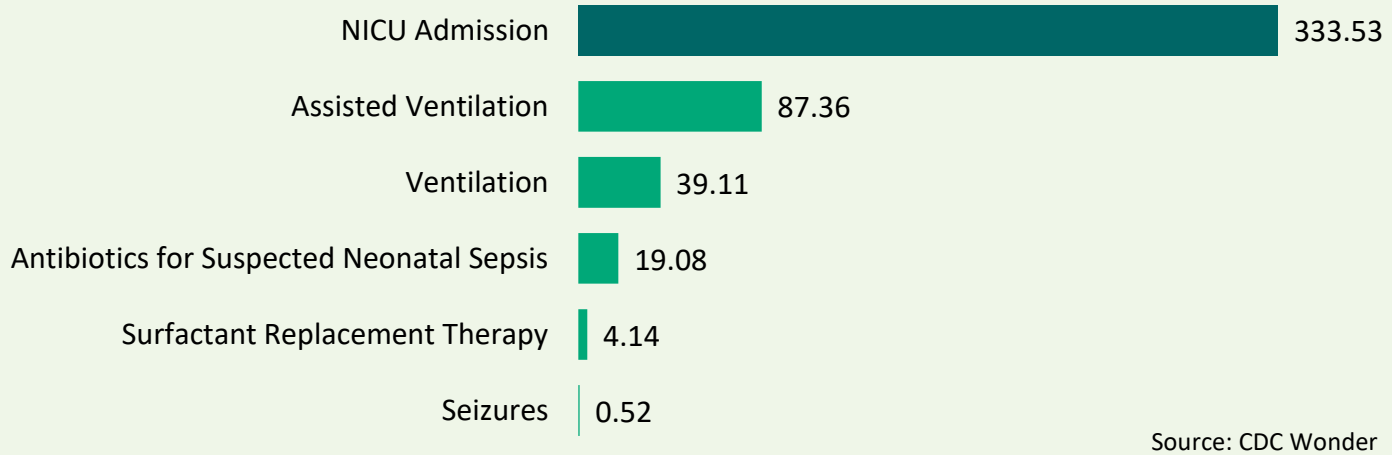
Among these, plural births present the highest increased risk, being 5.622 times more likely to result in a late preterm birth compared to the general population. Following this, gestational hypertension, infertility treatments, and tobacco use are the next leading risk factors. Specifically, women with gestational hypertension are 1.975 times more at risk, those undergoing infertility treatments are 1.690 times more at risk, and tobacco users are 1.442 times more at risk for a late preterm birth vs the overall population.

Additionally, several neonatal comorbidities show a higher incidence in the late preterm birth population compared to the general population. NICU admissions top this list, with about one-third of late preterm births being admitted to the NICU from 2018 to April 2024 in Virginia. The NICU admission rate for late preterm births is over 3 times higher, increasing from 79.18 per 1,000 in all live births to 333.53 per 1,000 in late preterm births.

Considering appropriate actions for a quality improvement project, it is crucial to address both maternal and neonatal risk factors, as data indicate that both are associated with higher rates of late preterm birth.

NICU Admissions account for most abnormal conditions of newborn.

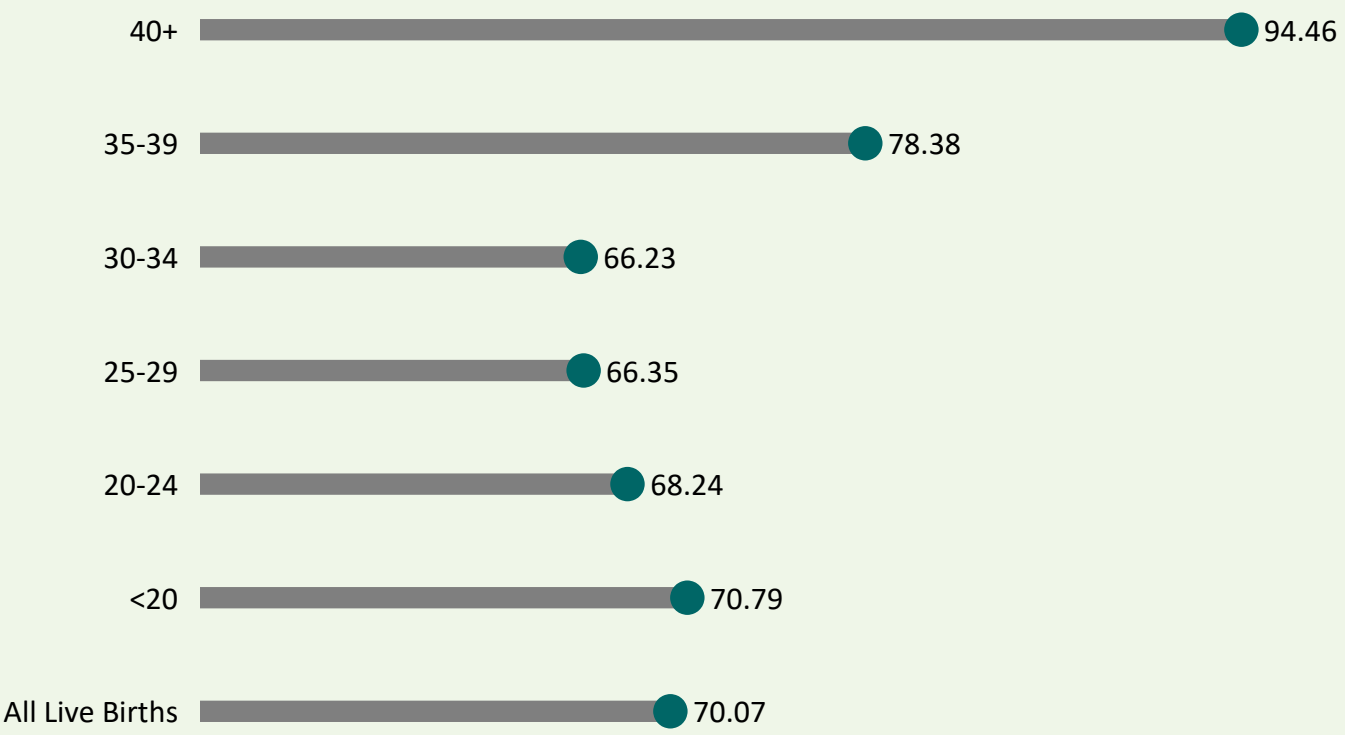
Incidence of abnormal conditions of newborn in late preterm births per 1,000 live births, 2018 - April 2024.



Source: CDC Wonder

Rate of late preterm birth is higher when maternal age is 35-39 and 40+.

Incidence rate of late preterm births per 1,000 live births, 2018 - April 2024.



Source: CDC Wonder

Maternal age is a commonly cited factor contributing to the increased risk of certain adverse pregnancy outcomes. This trend is particularly evident in the data for late preterm births, as illustrated in the above graph. The data highlights a clear distinction in the incidence rates of late preterm births among different maternal age groups. Notably, women aged 35 to 39 and those aged 40 and above exhibit higher incidence rates of late preterm birth.

For the 35-39 age group, the incidence rate is 78.38 per 1,000 live births, making this group approximately 1.11 times more at risk for late preterm birth compared to all live births. In the 40+ age group, the incidence rate increases to 94.46 per 1,000 live births, indicating that women in this age bracket are 1.35 times more likely to experience a late preterm birth.

Conversely, the age ranges of 25 to 29 and 30 to 34 demonstrate the lowest incidence rates of the maternal age groups. The 25-29 maternal age group has an incidence rate of 66.35 per 1,000 live births, while the 30-34 age group shows a nearly identical rate of 66.23 per 1,000 live births. Both groups have a reduced risk for late preterm births, with a relative risk around 0.95.

It is also important to note that the average maternal age in Virginia from 2018 to April 2024 is 29.82 years. Despite the higher incidence rates observed in older maternal age groups, there is also an elevated rate among mothers under 20 years old. Younger and teenage pregnancies often carry higher risks for adverse pregnancy outcomes, a trend that is well-documented in maternal health studies.

Maternal age is a crucial factor to consider in prenatal care and planning. These differences in incidence rates emphasize the necessity for targeted interventions and tailored healthcare strategies for different age groups. Recognizing the specific risks associated with various maternal ages can help healthcare providers implement more effective preventative measures and support systems, ultimately improving pregnancy outcomes for all age groups.

Cesarean Deliveries

Cesarean deliveries make up a larger proportion of late preterm births compared to all live births.

Delivery methods for all live births and late preterm births, 2018 - April 2024.

Source: CDC Wonder

The data from 2018 to April 2024 show cesarean deliveries constitute a larger proportion of late preterm births compared to all live births in Virginia. Specifically, the overall cesarean rate is 32.32% of all live births, whereas the rate for late preterm births is significantly higher at 49.20%. This represents an increase of over 50% in the rate of cesarean deliveries for late preterm births.

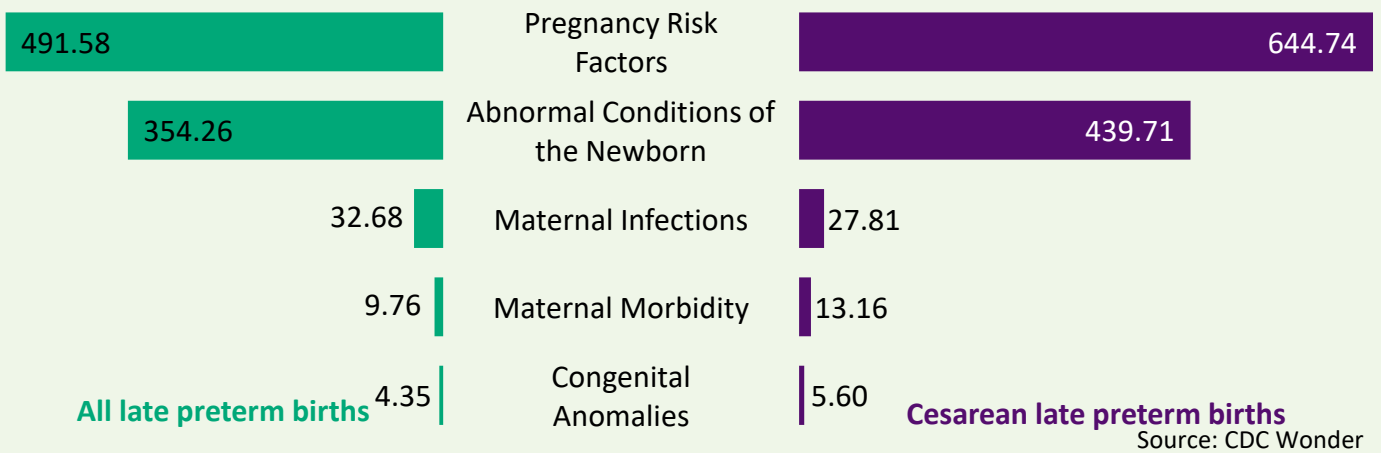
Beyond the inherent complications associated with late preterm births, cesarean deliveries introduce additional risks. With nearly half of all late preterm births being delivered by cesarean section, it is crucial to understand the factors driving this disparity. The chart below highlights the comorbid conditions affecting women with late preterm births and those specifically undergoing cesarean deliveries. These data mirror the differences in comorbidities seen on page 6.

The data reveal significant increases in pregnancy risk factors and abnormal conditions of the newborn in cesarean deliveries compared to all late preterm births. There is over a 30% increase in pregnancy risk factors and nearly a 25% increase in abnormal conditions of the newborn for cesarean deliveries within the late preterm population. This is telling that pregnancy risk factors and abnormal conditions increase the likelihood of both late premature birth and a cesarean delivery.

Given the myriad of adverse outcomes potentially stemming from cesarean deliveries, it is essential to consider strategies to reduce the cesarean rate in late preterm births. This could involve enhancing prenatal care, implementing targeted interventions, and promoting alternative delivery methods, when possible, to improve maternal and neonatal outcomes.

Pregnancy Risk Factors and Abnormal Conditions of the Newborn are comorbid more frequently with cesarean late preterm births.

Comorbidity rates per 1,000 live births, 2018 – April 2024.

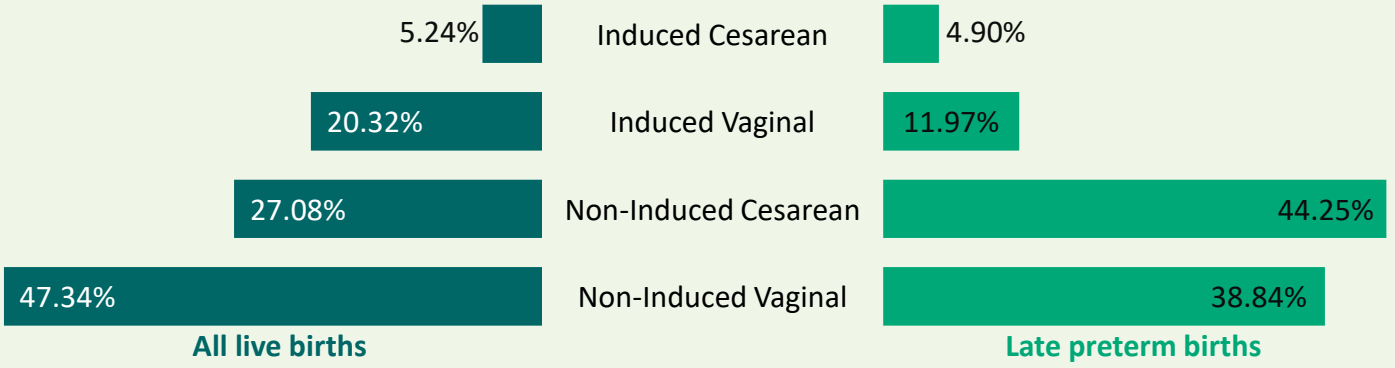


Source: CDC Wonder

Induced Labor & Delivery

Spontaneous labor occurs at a higher rate in late preterm births.

Labor inductions with delivery methods for all live births and late preterm births, 2018 - April 2024.



Source: CDC Wonder

Another comorbidity associated with adverse outcomes is birth induction. Contrary to what might be inferred from previous analyses on late preterm births, the induction rate for late preterm births is lower than that of the total population. Specifically, induced births in the late preterm population account for about 17% of all such births, nearly 10% lower than the induction rate of approximately 26% observed in the total population.

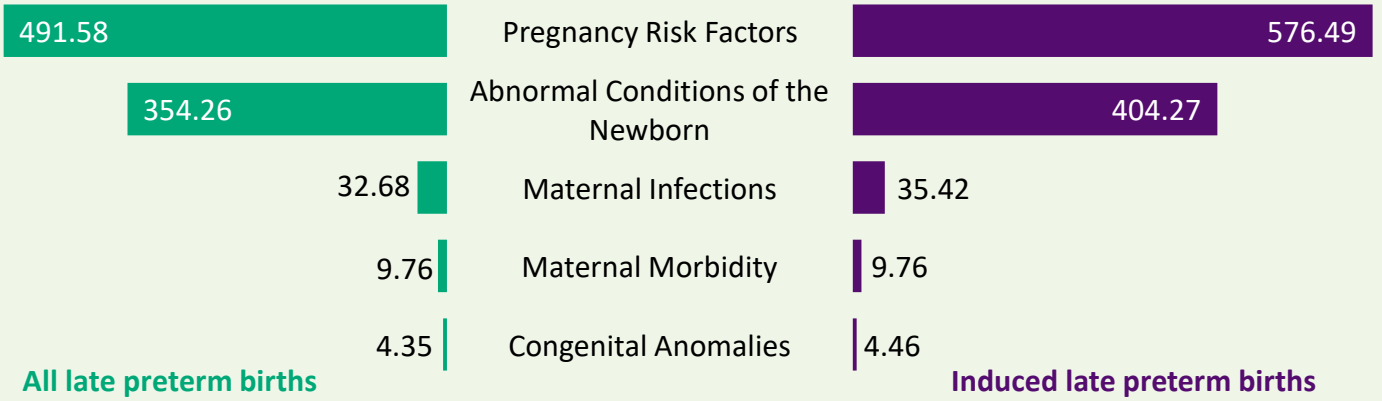
When examining birth spontaneity, the most common delivery method for late preterm births, with spontaneity considered, is spontaneous cesarean delivery. Nearly half of all late preterm births are spontaneous cesareans, a significantly higher rate compared to 27% in the total population. This disparity underlines the need for a better understanding of how birth spontaneity influences late preterm births.

Further analysis of risk factors comparing all late preterm births to only those that are induced reveals a notable increase in risk factors associated with birth inductions. At the top of this list are pregnancy risk factors and abnormal conditions of the newborn. Nearly 60% of induced late preterm births involve a pregnancy risk factor comorbidity. Additionally, abnormal conditions of the newborn are present in just over 40% of induced late preterm births.

Understanding the impact of birth induction on late preterm births, much like assessing the effects of cesarean deliveries, is crucial for future quality improvement initiatives. These insights can guide healthcare providers in developing targeted interventions to manage and reduce the risks associated with different types of birth processes in the late preterm population, ultimately improving maternal and neonatal outcomes.

Pregnancy Risk Factors and Abnormal Conditions of the Newborn are comorbid more frequently with induced late preterm births.

Comorbidity rates per 1,000 live births, 2018 – April 2024.



Source: CDC Wonder

Discussion

The analysis of late preterm births in Virginia from 2018 to April 2024 reveals key findings on racial disparities, birth weights, geographical variations, and associated risk factors. Black Non-Hispanic populations experience significantly higher rates of late preterm births compared to White Non-Hispanic populations, suggesting deeper socio-economic and healthcare access issues that necessitate focused healthcare interventions.

Late preterm births often result in low birth weights, with nearly 44% of these infants falling below the threshold, requiring advanced medical care. This underscores the importance of specialized attention for both low and healthy weight late preterm infants.

Risk factors such as gestational hypertension, infertility treatments, and tobacco use significantly increase the likelihood of late preterm births. Additionally, cesarean deliveries are notably prevalent among late preterm births, introducing further risks and complications. The high rates of NICU admissions and other neonatal complications emphasize the need for vigilant postnatal care.

Maternal age also plays a significant role, with higher risks observed among older and younger mothers. This trend stresses the importance of targeted prenatal care for different age groups to mitigate associated risks.

In summary, late preterm births in Virginia are influenced by a combination of racial, geographical, maternal, and neonatal factors. Addressing these issues through ongoing monitoring and tailored interventions is crucial for improving maternal and infant health outcomes across the state.

Next Steps

1. Develop a survey to be disseminated to all birth hospitals to understand admission criteria for Late Preterm Infants.
2. Examine Care variability withing the state and disseminate analysis.
3. Review hospital responses and make further recommendations to address gaps.

Limitations

The report has some limitations due to its data sources. While the CDC Wonder system is valuable, its geographical coverage is limited, necessitating the use of hospital discharge data for regional trends. Future analyses may require more specialized data collection to include factors like medical reasons for preterm labor and delivery, as well as procedures or medications administered to late preterm infants. These limitations restrict understanding of causes and management of late preterm births, highlighting the potential need for more comprehensive data for better interventions and outcomes.

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