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**3:30 p.m. to 3:45 p.m.**

**Research Paper**

Tennessee Academy of Family Physicians  
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The Park Vista Doubletree Hotel, Gatlinburg, Tennessee  
October 19-22, 2021

**“Effects of Post Date Induction on Maternal C-Section Rates and Neonatal Outcomes During the COVID-19 Pandemic”**

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**Presentation Objectives:**

- 1) Outline specific maternal and fetal outcomes that could be impacted by postponing induction of labor.
- 2) Assess whether C-section rates changed during COVID-19 due to the institutional policy change.
- 3) Identify any significant clinical outcomes compared to pre-COVID-19 vs. during the COVID-19 time period.

# Effects of Post Dates Induction Policies on Maternal C-Section Rates and Neonatal Outcomes During the COVID-19 Pandemic

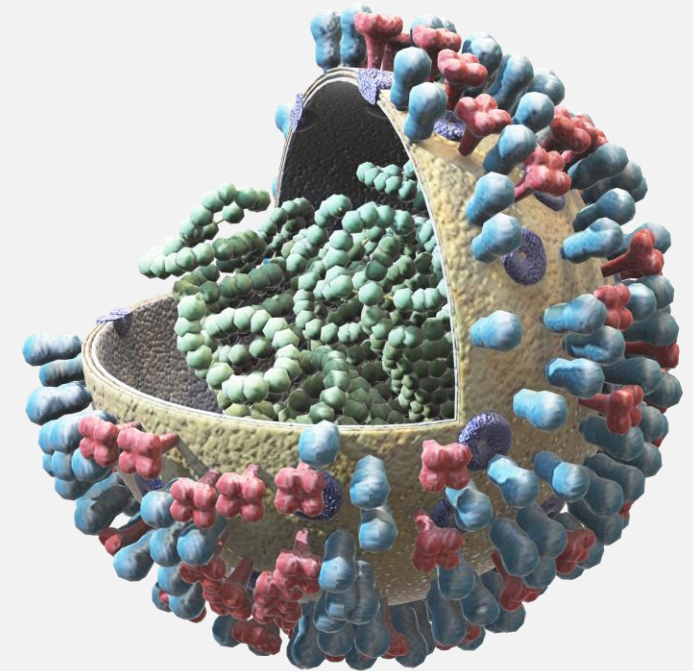
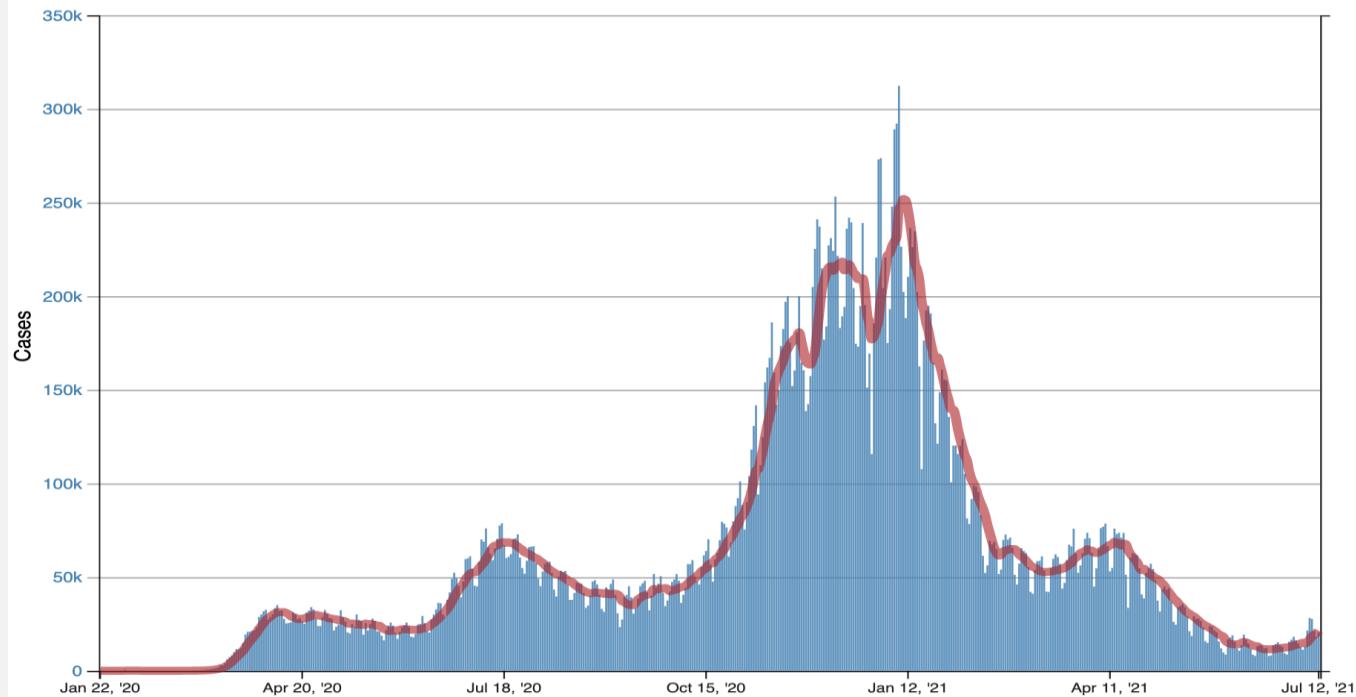
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# COVID-19: THE PANDEMIC CONTINUES...

- SARS-COV-2 emerged in December of 2019 and continues to be a deadly virus that has taken the lives of millions of people around the world
- More than 605,000 people in the United States have died, and over 4 million people have passed away globally.

Daily Trends in Number of COVID-19 Cases in the United States Reported to CDC



# A little closer to home....

Cases	Deaths	Hospitalizations	Tests
<b>+5,168</b> since yesterday	<b>+11</b> since yesterday	<b>+41 (net)</b> since previous day	<b>+16,865</b> since yesterday
<b>1,124,713</b> Total	<b>13,890</b> Total	<b>3,841</b> Current Total*	<b>9,405,258</b> Total 18.11% Positive Today

Tennessee COVID-19 Stats (as of 9/10/21)

# WHAT DOES THE LITERATURE SAY ON COVID-19 AND PREGNANCY?



- According to a study published in UpToDate, pregnancy does not appear to increase susceptibility to COVID-19 however it does appear to worsen clinical course if a pregnant patient is infected. (3)
- Most pregnant persons recover without undergoing hospitalization, but pregnant patients appear to be at increased risk of severe disease compared to non-pregnant patients experiencing symptoms. (3)
- A study published in the European Journal of Obstetrics and Gynecology found that there were increased rates of C-sections in Covid-19 infected patients compared to uninfected. (4)
- The CDC also reports that the risk of severe illness in pregnant patient infected with Covid-19 is increased over infected non-pregnant patients. (5)
- An NIH study looking at C-section rates in a New York hospital showed no significant change during COVID-19. (8)

## WHAT DOES THE LITERATURE SAY ABOUT POSTPONING INDUCTION OF LABOR?

The ACOG recommends elective induction of labor at 39 weeks and 0 days gestational age. (6)

Inducing labor at 39 weeks gestation significantly decreased c-section frequency compared to expectant management. (10)

There is not a higher frequency of adverse fetal outcomes when comparing induction at 39 weeks and expectant management. (10)





## UT FAMILY MEDICINE CENTER-JACKSON

The Jackson- Madison County General Hospital had a policy change during COVID-19 (April 2020) that involved labor inductions.

Only 8 inductions per day can be scheduled and if a cervix was not favorable the patient could not be induced until 40 weeks and 4 days gestational age.

The previous policy allowed inductions at 39 weeks as per ACOG recommendations.

# OBJECTIVES

Outline specific maternal and fetal outcomes that could be impacted by postponing induction of labour.

Assess whether C-section rates changed during COVID-19 due to the institutional policy changes.

Identify any significant clinical outcomes compared to pre-COVID-19 vs during the COVID-19 time period



# RESEARCH QUESTIONS

With the COVID-19 induction policy did overall C-section rates change in 2019 (pre-Covid) vs 2020 (Covid policy changes)?

Did the average gestational age change significantly during the COVID-19 pandemic?

Did the average birth weight change significantly during the COVID-19 pandemic?

Did the average APGAR score at 1 and 5 minutes change significantly pre vs. covid induction policy?

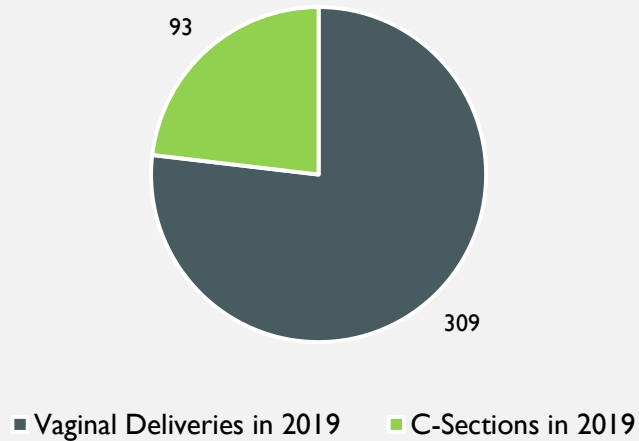
Did nulliparous patients have an increased risk of C-section during COVID-19?

# METHODOLOGY

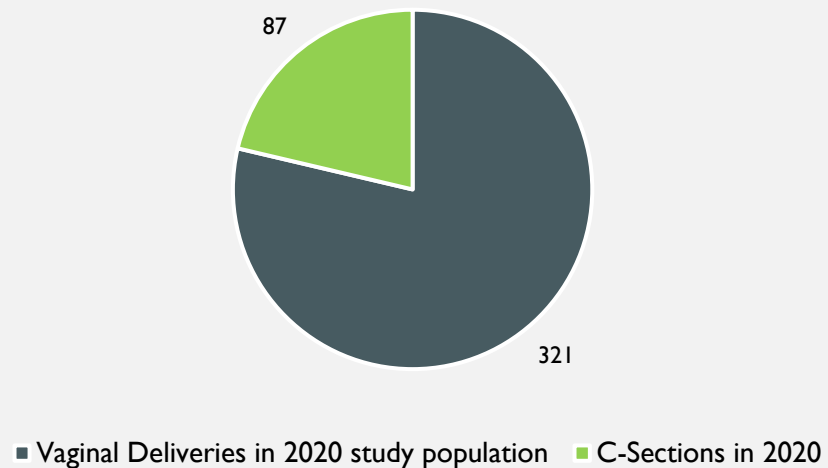
- Study Population: All pregnant patients undergoing delivery with the UT Jackson Family Medicine Department from April 2019-December 2019, and also April 2020-December 2020 were reviewed.
- Methods: All the UTFM deliveries between April 2019- December 2019 and April 2020- December 2020 were found in the Labor and Delivery log book. The following information was recorded on each patient: gestational period, gravidity and parity, APGAR scores at 1 and 5 minutes, newborn weight, and cesarean section vs. vaginal delivery.
- Data was analyzed for statistical significance using SPSS 27 and charts were made using Microsoft Excel.

# FIGURE I – COMPARING THE TOTAL C-SECTION RATE OVERALL IN 2019 VS 2020

Number of C-Sections in 2019 study population



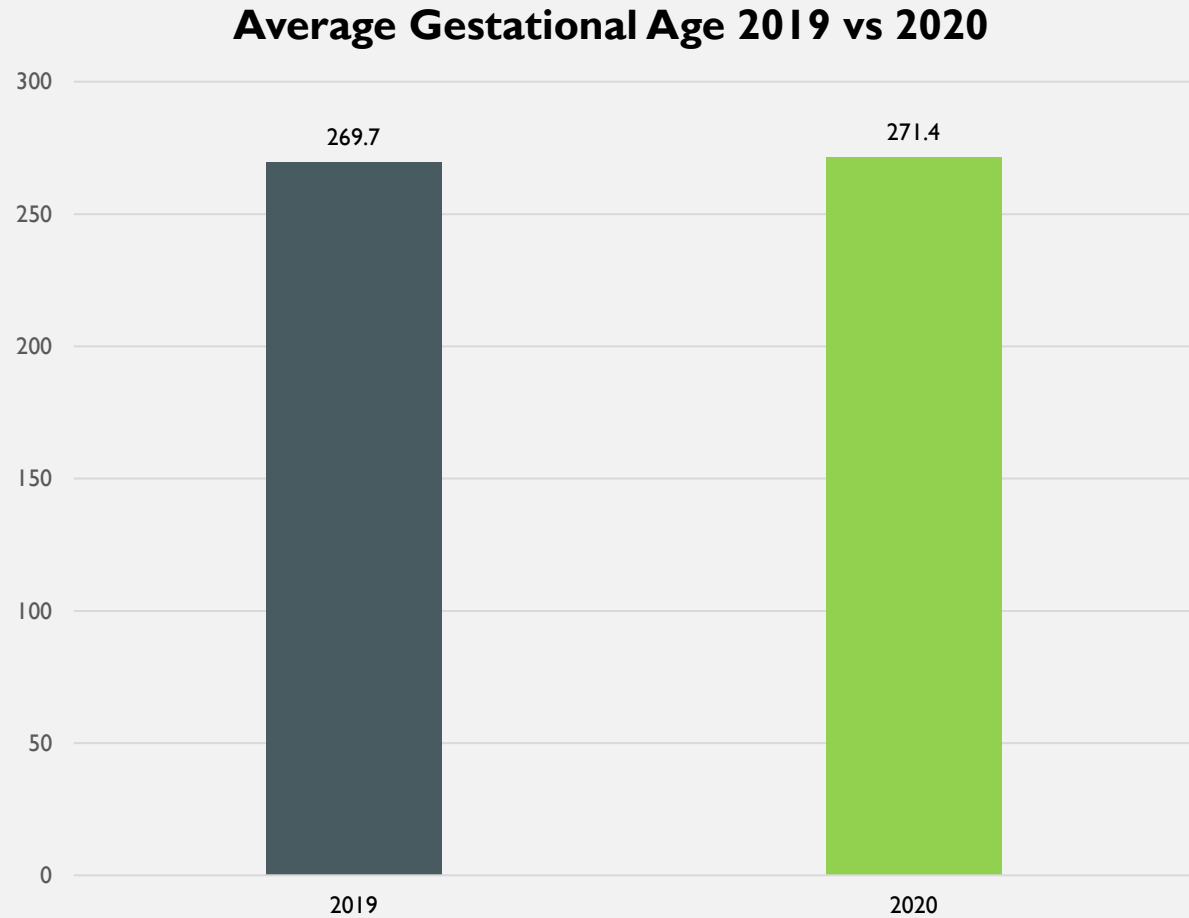
Number of C-Sections in 2020 study population



For all patients ( $n = 810$ ) who had deliveries within the time period of study, 180 (22%) had C-sections. There were 402 deliveries in 2019 (control group). Out of the 402, there were 93 C-sections (23.1%).

There were 408 patients in the 2020 COVID time period population and 87 had C-sections (21.3%). **There was no statistically significant difference in overall C-section rate ( $p = 0.53$ ).**

# FIGURE 2 – COMPARING AVERAGE GESTATIONAL AGE (IN DAYS) IN 2019 VS 2020

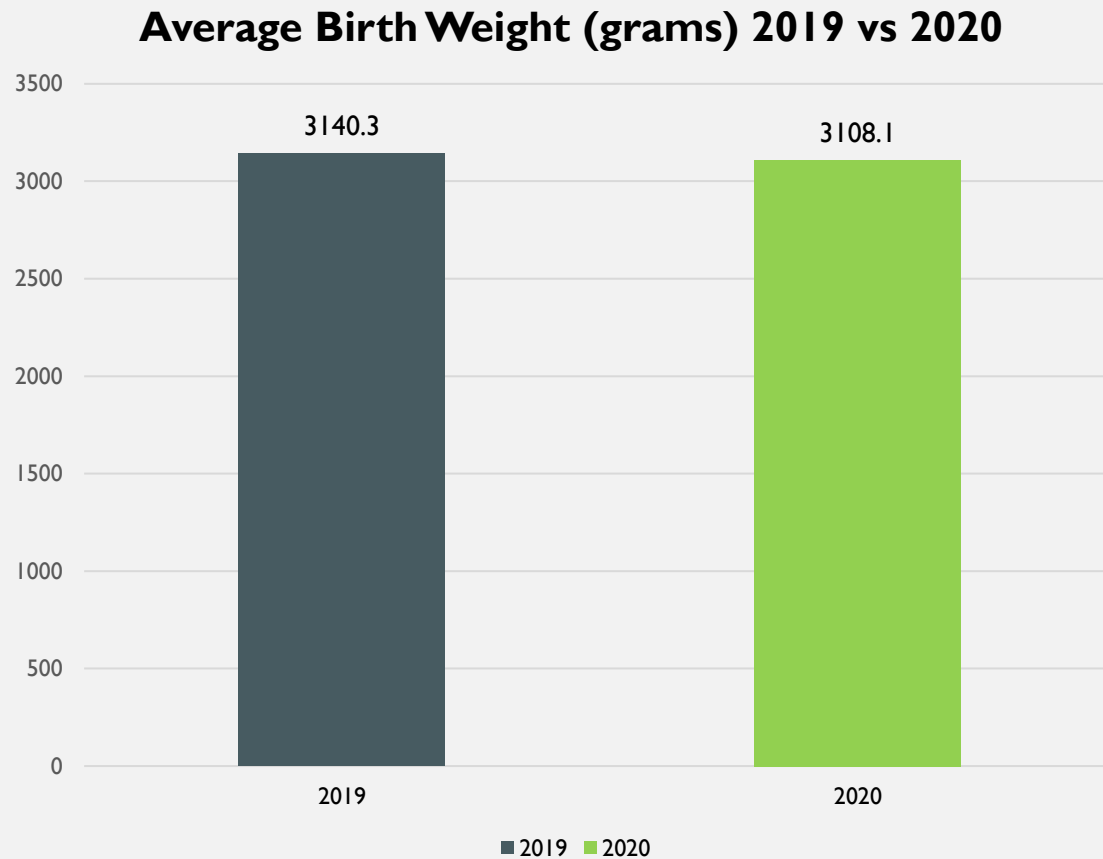


From the 402 patients delivered during the 2019 time period, the average gestational age was 269.7 days.

From the 408 patients in the 2020 time period, the average gestational age was 271.4 days.

**These findings show no significant difference in gestational age in 2019 vs. 2020 ( $p=0.127$ ).**

# FIGURE 3 – COMPARING AVERAGE BIRTH WEIGHT (GRAMS) IN 2019 VS. 2020



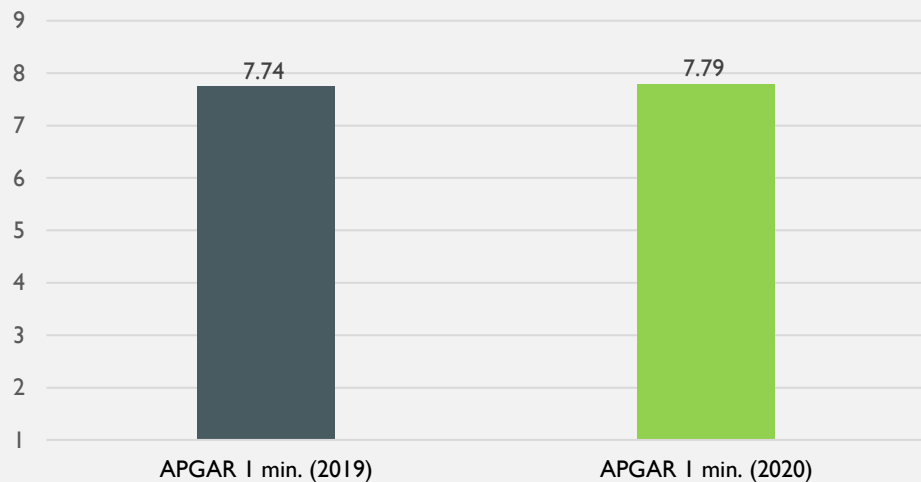
Out of the 402 patients from 2019 data, the average birth weight was 3140.3 grams.

From 2020 data, there were 408 patients and the average birth weight was 3108.1 grams.

**There was no statistically significant difference in average weight ( $p= 0.45$ ).**

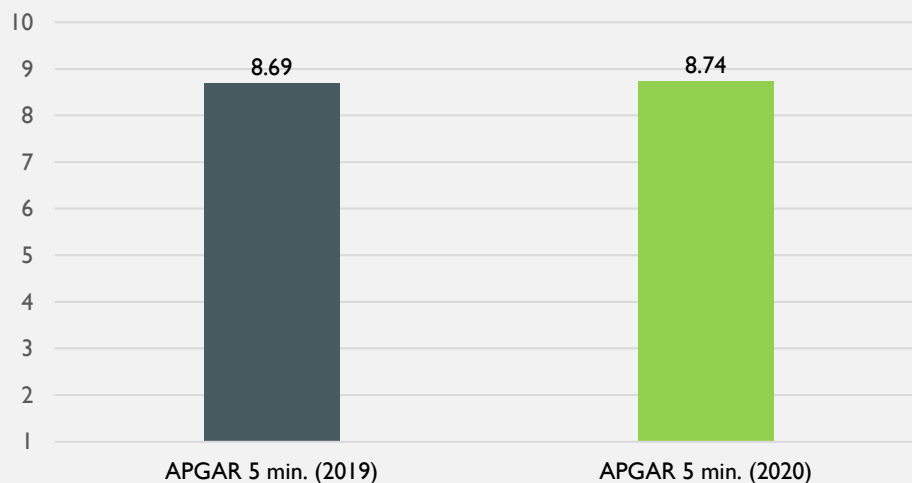
# FIGURE 4 – EXAMINING DIFFERENCES IN APGAR SCORES IN 2019 VS 2020

Average APGAR scores at 1 min in 2019 vs. 2020



The average APGAR score at 1 minute for our 2019 study population was 7.74 compared to 7.79 in 2020. (p-value = .57)

Average APGAR Scores at 5 min in 2019 vs. 2020

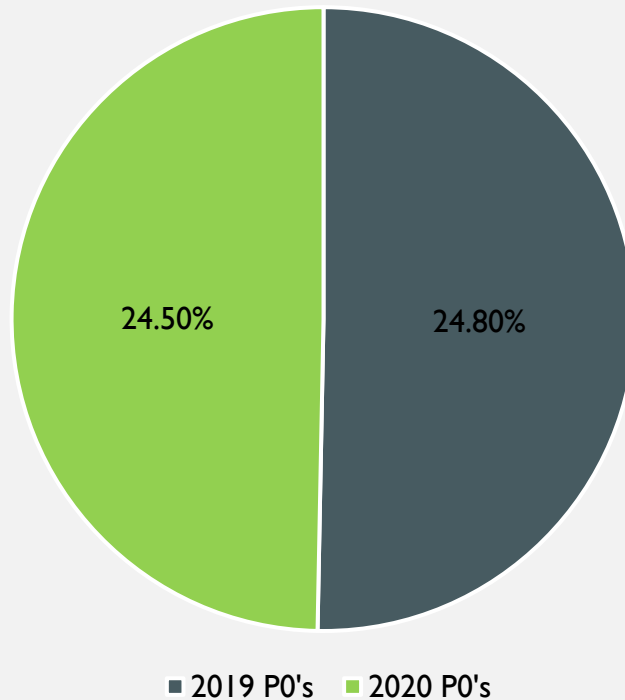


The average APGAR score at 5 minutes for our 2019 study population was 8.69 compared to 8.74 in 2020. (p-value = .62)

**For both APGAR scores there were no significant differences comparing 2019 vs. 2020.**

# FIGURE 5 – EXAMINING G I P0 PATIENTS AND THE DIFFERENCE IN C-SECTION RATES IN 2019 VS 2020

Percent of P0's with C-sections in 2019 vs 2020



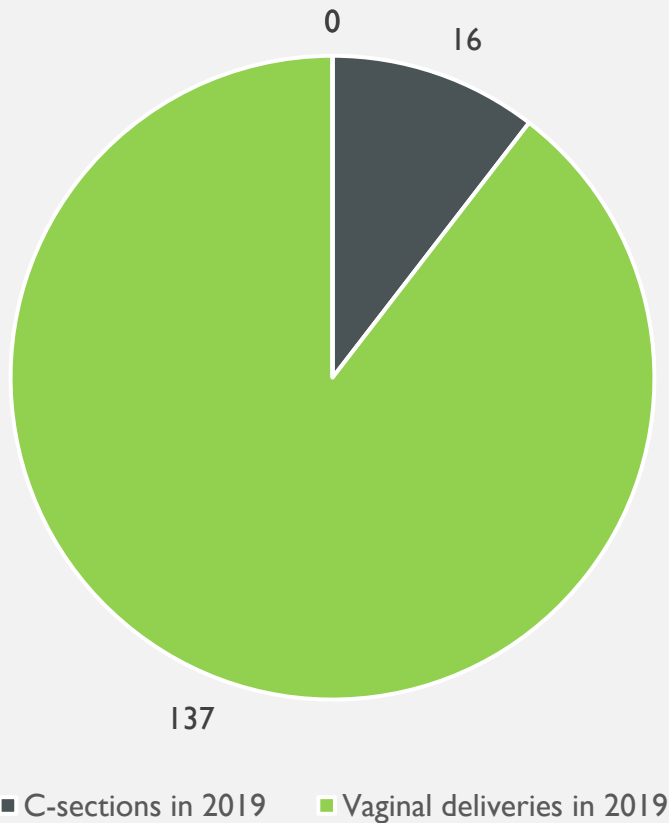
There were 284 total G I P0 (P0) patients in our study. There were 34 C-sections out of 137 P0 patients in 2019 pre-Covid-19.

There were 36 C-sections out of 147 P0 patients during Covid-19.

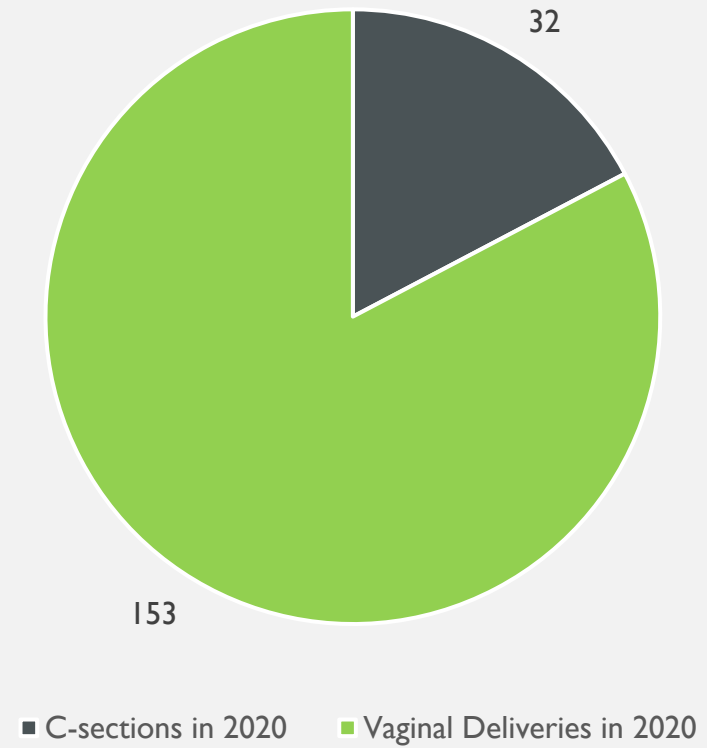
**For both P0 patients in 2019 and 2020, there were no significant differences. ( $p = 0.94$ )**

# FIGURE 6 — EXAMINING THE C-SECTION RATE AMONG INDUCED PATIENTS IN 2019 VS 2020

Induction Outcomes in 2019



Induction Outcomes in 2020





# DISCUSSION

1. There was no significant difference in C-section rates for the 2019 pre-Covid-19 delivery population vs. 2020 during Covid-19 delivery population.
2. There were no significant differences in gestational age, birth weight, and APGAR scores at 1 and 5 minutes.
3. There were no changes in C-section rates for nulliparous patients in both of our study groups.
4. Of the inductions in each year, there was no significant difference between C-section rates.
5. The policy change for inductions at UT Jackson Family Medicine during COVID-19 did not have any significant change on maternal and fetal outcomes.

## ...AND LIMITATIONS

- Our study was concerned with a specific subset of deliveries that were affected by pushing induction dates past .
- However, the review included all deliveries during that time, not specifically only inductions.
- Further chart review would be needed to examine the differences in earlier inductions vs later post dates inductions and their outcomes w/ regards to c sections.
- Current preliminary data suggests that there is no significant difference in rates of induction between the two years, but there are not enough data points to compare statistically.



## FUTURE DIRECTIONS

- Examine other outcomes related to pregnancy, such as pre-eclampsia, LGA, or IUFD.
- Examine the policy's affect on other private OBGYN practices that also fall under the jurisdiction of this same policy.
- Explore the relationship between delayed inductions and access to prenatal care could yield reasons as to why neonatal outcomes did or did not change.

# ACKNOWLEDGMENTS

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