| **If before pregnancy, you were…** | **You should gain…** |
| --- | --- |
| **Underweight** BMI less than 18.5 | 28-40 pounds |
| **Normal Weight** BMI 18.5-24.9 | 25-35 pounds |
| **Overweight** BMI 25.0-29.9 | 15-25 pounds |
| **Obese** BMI greater than or equal to 30.0 | 11- 20 pounds |

Overview of dataset and the question you are trying to answer

* Think of the background section of a paper
* Read up on the disease, variables (e.g. what are typical values)
  + Put things in simpler terms (do not assume people are scientists or doctors!)
* Explanation of key variables you are considering and why (e.g. are they confounders, of scientific interest?)

Exploratory data analysis (tables, plots)

* Check for missing values
* Check assumptions of normality/assess transformations where necessary

Explanation of what hypotheses you are testing, what parameters you are estimating, what models you are using and why

* Your main analysis must be a multiple linear regression (Hint: choose a dataset with a continuous outcome)
* Results of hypothesis testing/estimation (include p-values and confidence intervals!)

Interpretation of results/conclusions.

* This should be a substantial portion of your analysis.
* You should have at least 2 slides on this.
* Focus less on the detailed analysis/code.

You do not need to include every single detail, just the most important ones. This is not for the presentation. You have your file!!!

See next section :)

References

Xu, Richard et al. “DNA methylation mediates the effect of maternal smoking on offspring birthweight: a birth cohort study of multi-ethnic US mother-newborn pairs.” Clinical epigenetics vol. 13,1 47. 4 Mar. 2021, doi:10.1186/s13148-021-01032-6

Robert L Goldenberg, Jennifer F Culhane, Low birth weight in the United States, The American Journal of Clinical Nutrition, Volume 85, Issue 2, February 2007, Pages 584S–590S, <https://doi.org/10.1093/ajcn/85.2.584S>

Metgud, Chandra S et al. “Factors affecting birth weight of a newborn--a community based study in rural Karnataka, India.” PloS one vol. 7,7 (2012): e40040. doi:10.1371/journal.pone.0040040

Low birth-weight (LBW) in infants includes babies who are born preterm (at < 37 weeks) or with fetal growth restriction weighing less than 2500 grams at birth. In the United States (US) and other developed countries, the survival rate of LBW infants has improved over the past 3 decades. However, LBW remains a consistent predictor for fetal health, morbidity, and possible demise. Infants born prematurely or with fetal growth restriction are at higher risk for short-term and long-term health morbidities including chronic medical conditions, such as diabetes, hypertension, and heart disease. Associated risk factors for LBW in infants have been noted across maternal populations in the United States including demographic background, socio-economic status, as well as mental and physical health (Goldenberg & Culhane, 2007). Knowing and understanding these risk factors as they are significantly correlated with LBW infants may be useful for facilitating interventions and prevention measures to improve pregnancy outcomes. In this exploratory analysis of US birth data gathered from the Centers for Disease Control and Prevention (CDC) in 2018, we explore the relationships between several risk factors for low birthweight in infants against actual birth weights reported.

An overview of current research regarding prevalent risk factors for low birth weight in infants revealed maternal and paternal demographics, educational background, overall maternal health status and morbidities, prenatal visit frequency, intrauterine infection inducing preterm labor, and smoking history or exposure had a significant impact on pregnancy outcomes and fetal growth restriction. Especially in the United States, it is observed that African American women, mothers with less education or low socio-economic status have twice the preterm birth rate and higher rates of growth restriction than other maternal populations. According to a cohort study of US births published in 2021, fetal smoking exposure adversely affected fetal growth reflected by lower birthweights the smoking-exposed population verses non-smoking-exposed newborn population. Subsequently, our dataset and analysis will explore similar variables and risk factors aside infant birthweights to assess which features may have an impact on fetal growth.

Maternal health status during pregnancy is measured in our dataset by maternal body mass index (BMI) as “BMI”, pre-pregnancy weight as “PWgt\_R” measured in pounds (lbs), maternal weight gain throughout pregnancy as “WTGAIN” measured in pounds (lbs), the interval since last pregnancy as “ILP\_R” measured in months, maternal age in years as “MAGER”, whether infection during pregnancy was reported as “NO\_INFEC”, presence of maternal morbidities and risk factors as “NO\_MMORB” and “NO\_RISKS”, cigarette use prior to pregnancy “CIG\_0”, prenatal visits as “PREVIS” and the month prenatal care began as “PRECARE”, prior births now dead as “PRIORDEAD”, prior births now living as “PRIORLIVE”, and any prior pregnancy terminations as “PRIORTERM”.

Paternal and maternal demographics are assessed by father’s education (“FEDUC”), mother’s education (“MEDUC”) and maternal/paternal race (“MRACE” and “FRACE”). The sex of the baby and infant birth weight in grams are recorded under “SEX” and “DBWT”.

These variables encompass significant maternal, paternal, and environmental factors that may have an effect on fetal birthweight. Potential confouders in our dataset include \_\_\_\_\_. All data is non-binary and filtered to have no missing or inappropriate values prior to analysis.

+++DBWT: Birth Weight – Detail in Grams (Edited)

0227-8165 Number of grams

9999 Not stated birth weight

99 Unknown or not stated

+MRAVE6: Mother's Race

+SEX: Sex of Infant

M Male

F Female

Raman, Ts Raghu et al. “LOW BIRTH WEIGHT BABIES : INCIDENCE AND RISK FACTORS.” Medical journal, Armed Forces India vol. 54,3 (1998): 191-195. doi:10.1016/S0377-1237(17)30539-7

Carter, E B et al. “Number of prenatal visits and pregnancy outcomes in low-risk women.” Journal of perinatology : official journal of the California Perinatal Association vol. 36,3 (2016): 178-81. doi:10.1038/jp.2015.183