

Maternal Outcomes & Interventions

Janssen, P. A., Saxell, L., Page, L. A., Klein, M. C., Liston, R. M., & Lee, S. K. (2009).

Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, 181(6-7), 377–383. <https://doi.org/10.1503/cmaj.081869>

The data for this section comes from a table within the article cited above. Regarding potential data quality issues, it contains only summary counts for different birth setting/caregiver combinations, so we would not be able to derive many other variables ourselves other than grouping by caregiver or setting. Additionally, data on caregiver differences (midwife vs. physician) is overall very sparse, so we may pivot to other goals with maternal and fetal health. We entered the data from the table in the article into a .csv file by hand since the table was an image. Since the data are counts, we also generated parallel datasets of the ratios of each maternal outcome and intervention by dividing by the total in that row so that outcomes/interventions could be accurately compared across setting/caregiver. Our initial hypothesis was that physician-led births would likely lead to more adverse outcomes for mothers or their neonates. The initial data exploration supports this hypothesis. Since there are so many different outcomes and interventions, this would be a great candidate for interactivity in a Shiny app where the user can select what data they want displayed on the y-axis of a barplot. Four variables from each dataset were explored using patchwork.

Global Mortality

Thomas Mock. (2018). Global Mortality. Retrieved March 13, 2022 from

<https://github.com/rfordatascience/tidytuesday/tree/master/data/2018/2018-04-16>.

This dataset contains neonatal and maternal mortality rates for 228 countries. This dataset is already tidy, where every row corresponds to one country in a particular year with associated mortality rates. To prepare a processed version of the dataset for our specific research goals, we used data from 2016 only (the most recently surveyed year in the dataset) since we are mainly interested in the current state of fetal/maternal mortality. To build some intuition about this dataset, we made a barplot of i) each country's maternal mortality and ii) each country's neonatal mortality rate. Though these two plots are not the most readable or informative, they give us some idea about how we might apply this data to an interactive or spatial data format. If we want to utilize a more global dataset such as this one, we may want to look into other factors that could affect maternal/fetal mortality and connect that to our other datasets.

Maternal Health Risk

Catherine Safrit. (2021, December). Maternal Health Risk Data. Retrieved February 12, 2022 from <https://www.kaggle.com/csafrit2/maternal-health-risk-data>.

This dataset consists of maternal health data collected through the IoT-based risk monitoring system. There are seven factors: age, systolic & diastolic blood pressure, blood sugar, body temperature, heart rate, and the associated risk level of the mother. One challenge with this dataset is that it gives only a predicted risk level and not the actual outcome, but it is still useful to identify which health conditions correlate with higher risk levels.

It was surprising that many of the rows have very similar values and appear to be duplicates. Given the nature of this data having just 6 measurements per entry, it is possible and probable that multiple people had the same readings for all 6 variables, so we should not rule out all duplicates yet. A next step that we should take with this dataset is identifying which factors most strongly influence risk level and in what way. Our progress so far suggests that blood pressure and blood sugar levels are some of the strongest indicators.

Overall Challenges

When working through this milestone, we found that one of the original datasets that we had planned on using had been removed from Kaggle and given that we had not already downloaded it, we had to work around this issue and find a dataset that portrayed similar data. As we explored the datasets more in depth and did some cleaning, we found that we will probably have to make changes to our original goal with our visualization. We found that our data is not as representative as we would like for creating visualizations for informing the public about the safest and most successful birth plan factors. Given this, we are using this milestone as a tool to explore more datasets and find a more specific approach to a visualization that can be beneficial to mothers. A better approach might be to look at more external or pathological factors of pregnancy to see which have the biggest impact on maternal and/or fetal outcomes. Our goal with our visualizations would then be to focus more on aspects such as location or health profile of the mother to determine which factors during pregnancy have the highest impact on birth outcomes.

More Information for Readers

The links to the data, the GitHub repository, and the cited research article are good resources to learn more about the context and cleaning of the data.