# My title*

**My subtitle if needed**

Zhixi(Arno) Qu

November 26, 2025

First sentence. Second sentence. Third sentence. Fourth sentence.

## 1 Introduction

Overview paragraph

Estimand paragraph

Results paragraph

Why it matters paragraph

Telegraphing paragraph: The remainder of this paper is structured as follows. Section 2….

## 2 Data

### 2.1 Overview

We use the statistical programming language R (R Core Team 2023)…. Our data (Toronto Shelter & Support Services 2024)…. Following Alexander (2023), we consider…

Overview text

### 2.2 Measurement

Some paragraphs about how we go from a phenomena in the world to an entry in the dataset.

*Code and data are available at: https://github.com/RohanAlexander/starter_folder.

## 2.3 Outcome variables

Add graphs, tables and text. Use sub-sub-headings for each outcome variable or update the subheading to be singular.

Some of our data is of penguins (Figure 1), from Horst, Hill, and Gorman (2020).

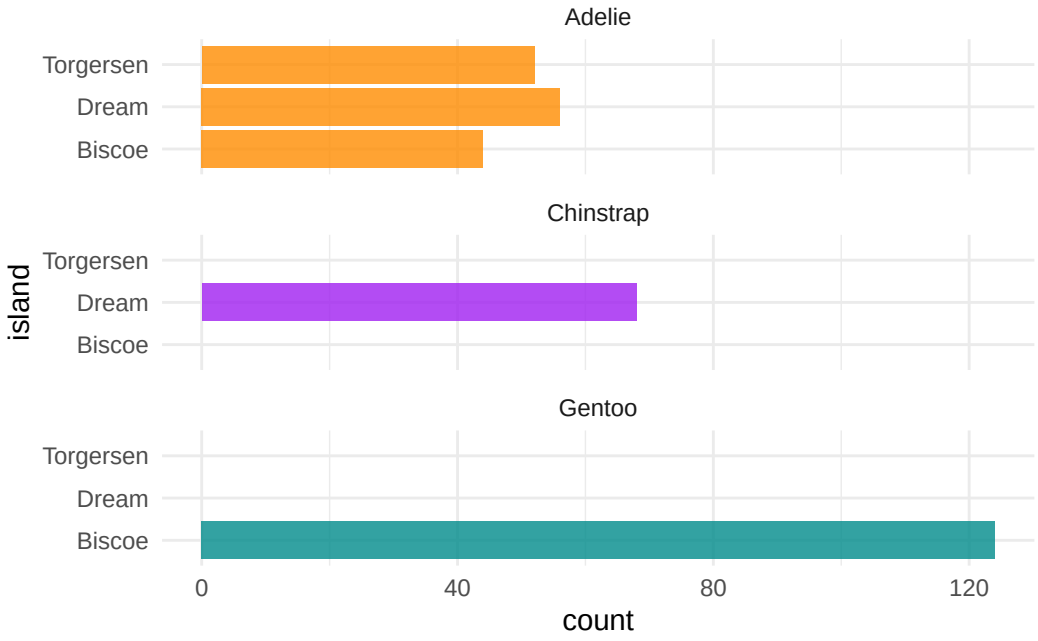


Figure 1: Bills of penguins

Talk more about it.

And also planes (Figure 2). (You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

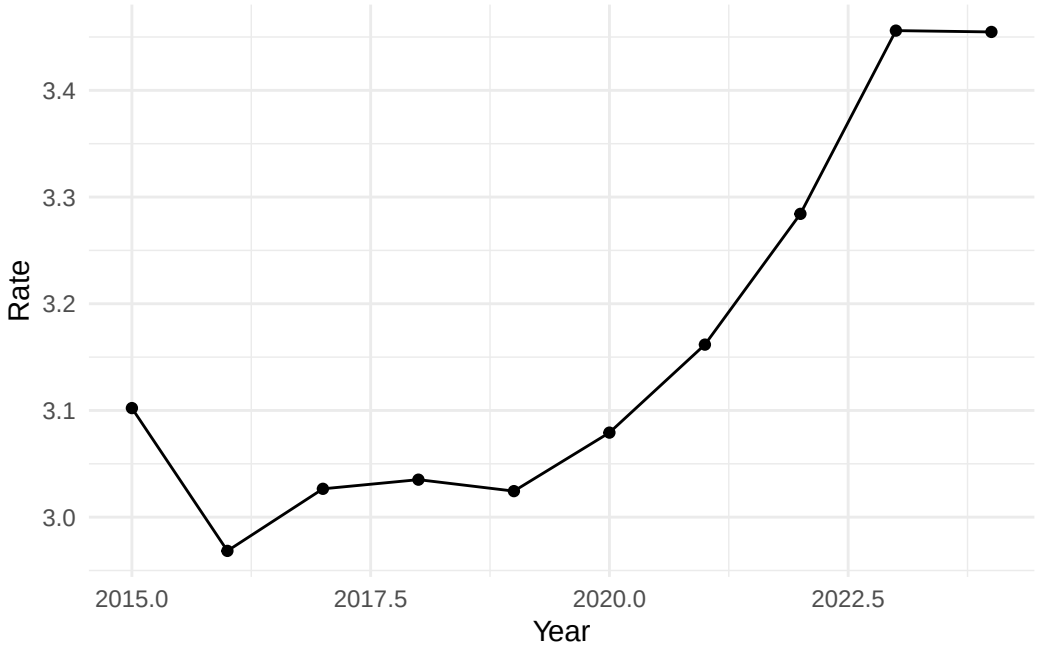


Figure 2: U.S. Fatal police shooting rate over time per million (rate)

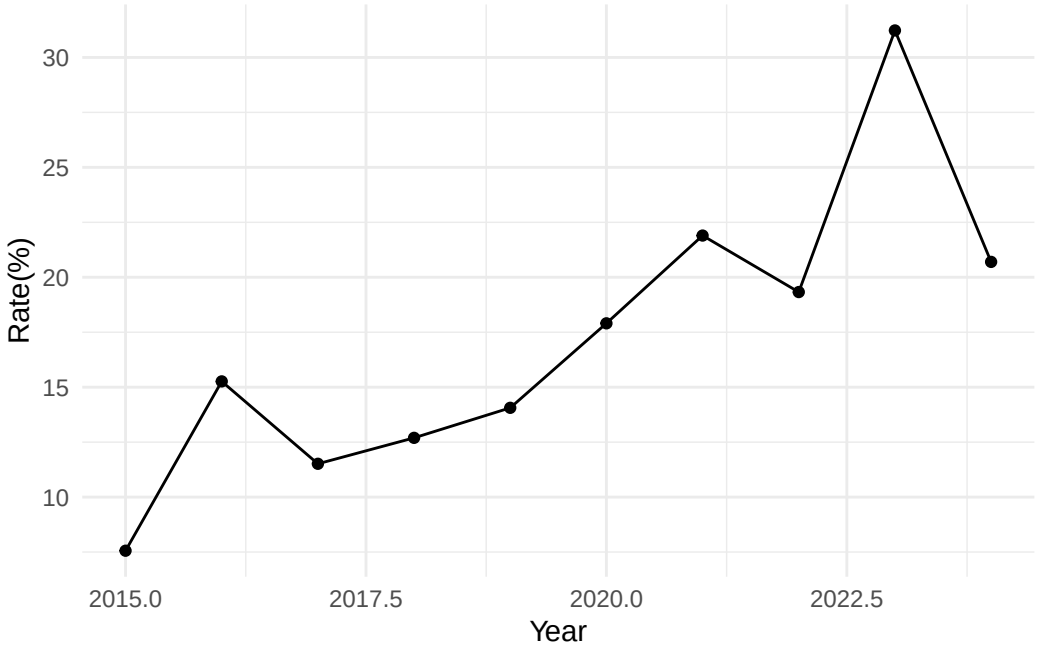


Figure 3: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

Talk way more about it.

## 2.4 Predictor variables

Add graphs, tables and text.

Use sub-sub-headings for each outcome variable and feel free to combine a few into one if they go together naturally.

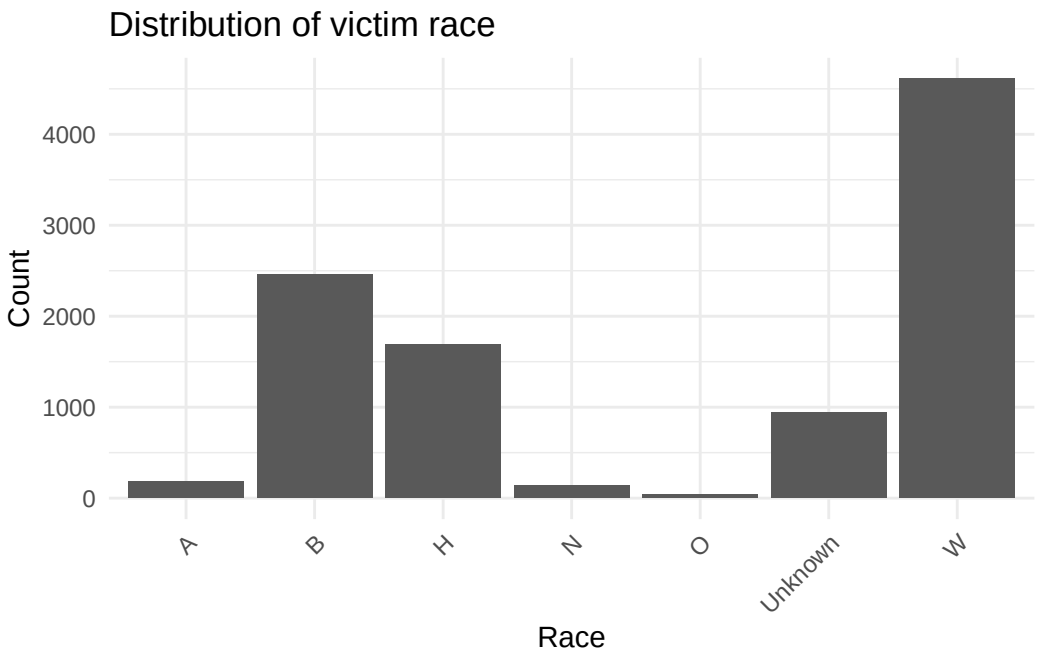


Figure 4: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

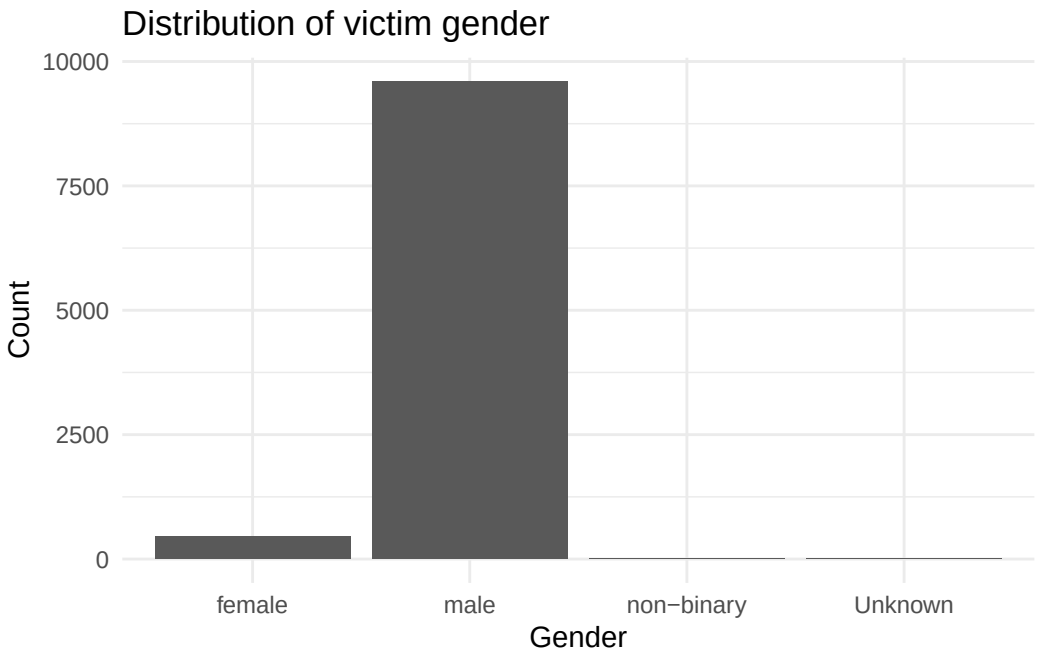


Figure 5: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

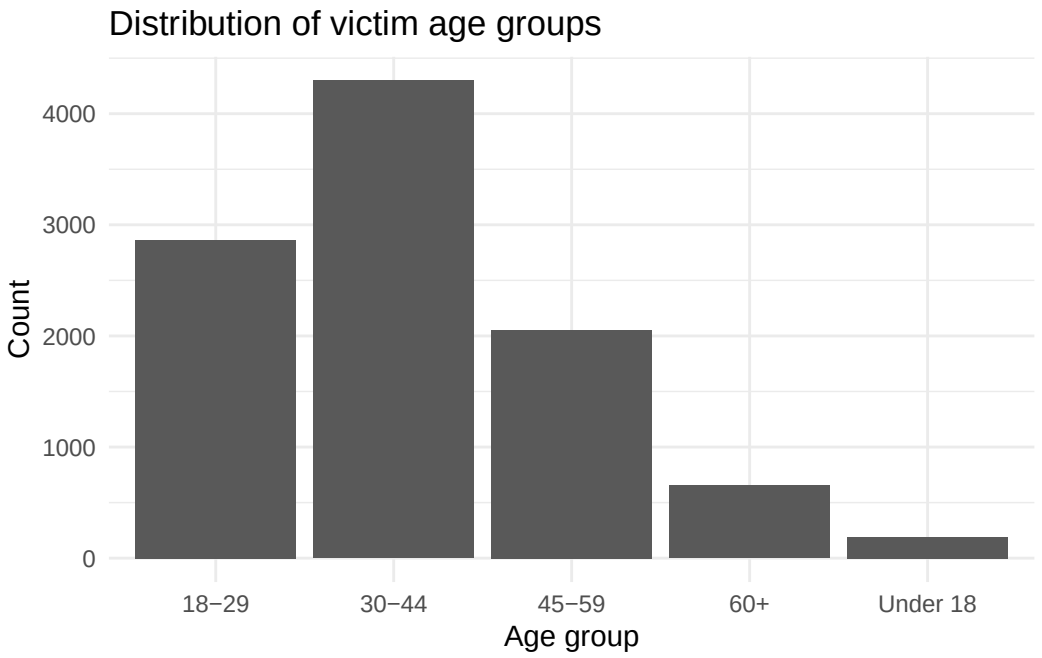


Figure 6: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

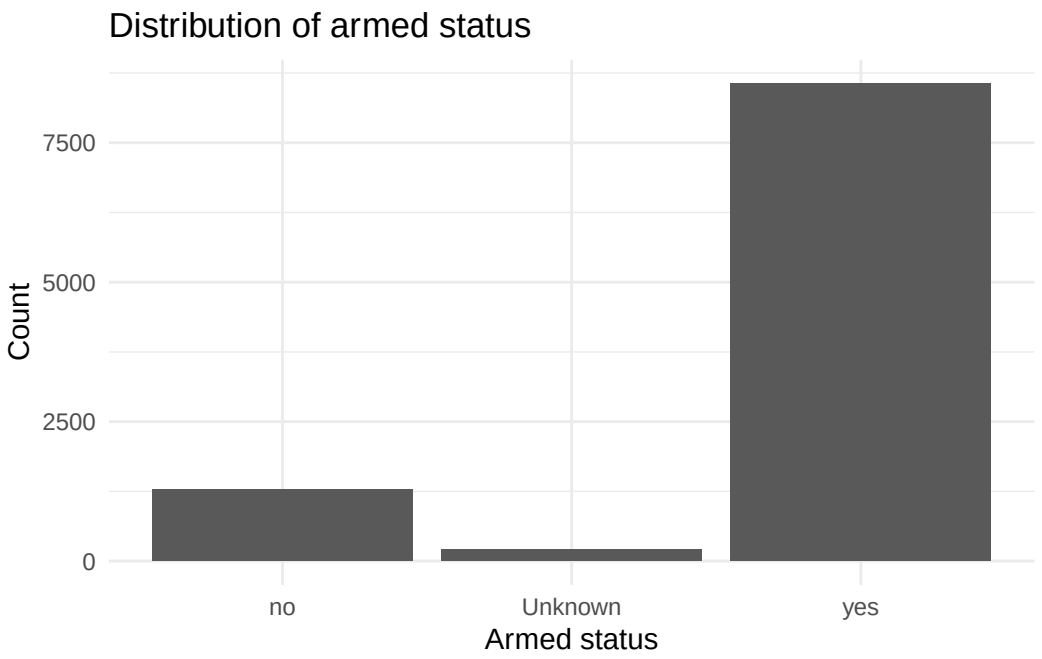


Figure 7: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

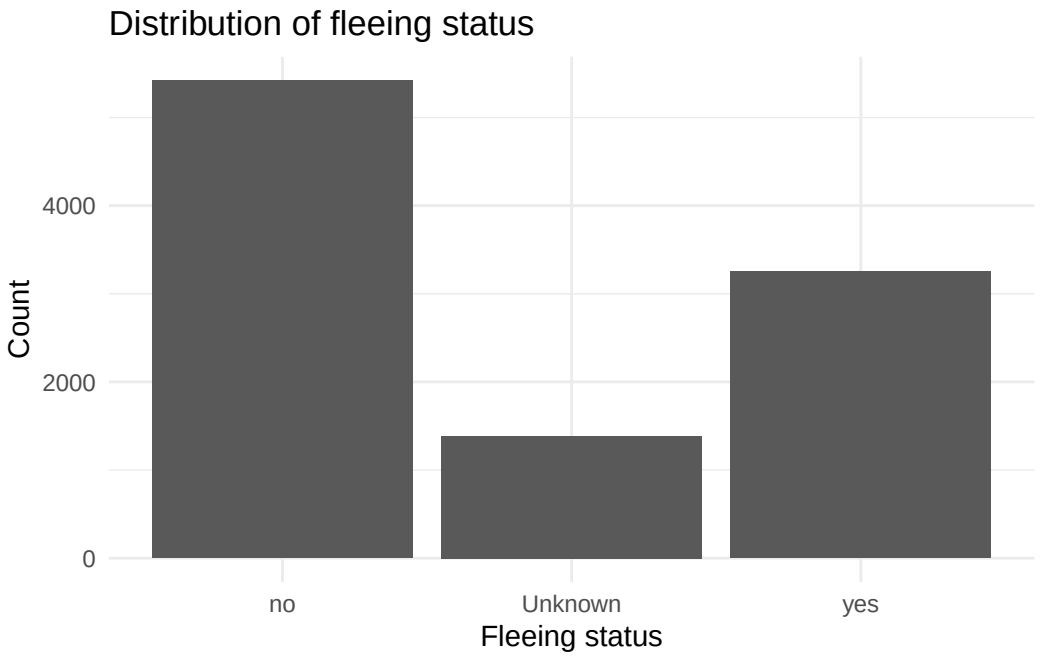


Figure 8: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

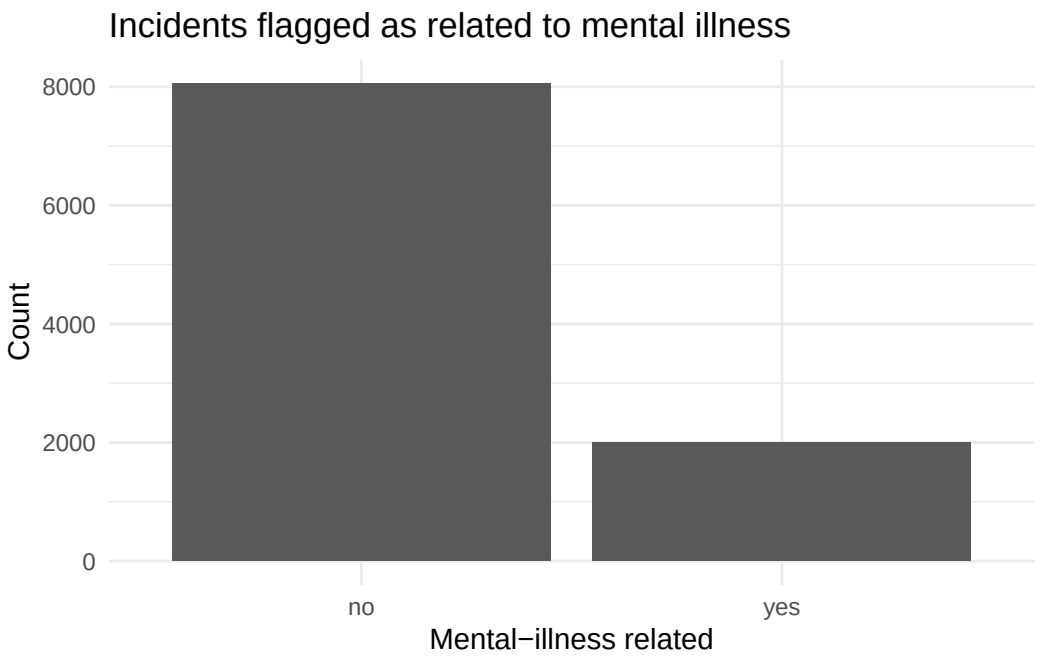


Figure 9: Active Rate of Body Cameras in Fatal Police Shooting(US 2015–2024)

# 3 Model

The goal of our modelling strategy is twofold. Firstly,…

Here we briefly describe the Bayesian analysis model used to investigate… Background details and diagnostics are included in **?@sec-model-details**.

## 3.1 Model set-up

Define $y_i$ as the number of seconds that the plane remained aloft. Then $\beta_i$ is the wing width and $\gamma_i$ is the wing length, both measured in millimeters.

$$y_i \mid p_i \sim \text{Bernoulli}(p_i)$$

$$\begin{aligned}\log\left(\frac{\hat{p}_i}{1-\hat{p}_i}\right) = \beta_0 + \beta_1\,\text{race}_i + \beta_2\,\text{gender}_i + \beta_3\,\text{age}_i + \beta_4\,\text{armed}_i + \beta_5\,\text{flee}_i \\ + \beta_6\,\text{mental\_health}_i + \beta_7\,\text{year}_i + \beta_8\,\text{race}_i \times \text{armed}_i\end{aligned}$$

$$\beta_0 \sim \text{Normal}(0, 2.5)$$
$$\beta_1 \sim \text{Normal}(0, 2.5)$$
$$\beta_2 \sim \text{Normal}(0, 2.5)$$
$$\beta_3 \sim \text{Normal}(0, 2.5)$$
$$\beta_4 \sim \text{Normal}(0, 2.5)$$
$$\beta_5 \sim \text{Normal}(0, 2.5)$$
$$\beta_6 \sim \text{Normal}(0, 2.5)$$
$$\beta_7 \sim \text{Normal}(0, 2.5)$$
$$\beta_8 \sim \text{Normal}(0, 2.5)$$

where, - $\hat{p}$ represents the probability that the body camera were activated. - $\beta_0$ represents the intercept term of this logistical regression. It is the probability that body cameras being activated when an individual belongs to the reference group for each categorical variable and the year is 2015. - $\beta_1$ is the coefficient corresponding to race of the victim. - $\beta_2$ is the coefficient corresponding to gender of the victim. - $\beta_3$ is the coefficients corresponding to age group of the person, Age group is categorical variable grouped by the victim's age. The categories are: Under 18, "18–29" "30–44" "45–59" "60+". - $\beta_4$ is the coefficients corresponding to whether the victim is armed. - $\beta_5$ is the coefficients corresponding to whether the victim is fleeing. - $\beta_6$ is the coefficients corresponding to whether the victim had a history of mental health issues. - $\beta_7$ is the coefficients corresponding to the year the event occurred. - $\beta_8$ is the coefficients corresponding to the interaction term between the race of victim and whether the victim were armed.

We run the model in R (R Core Team 2023) using the `rstanarm` package of Goodrich et al. (2022). We use the default priors from `rstanarm`.

### 3.1.1 Model justification

We expect a positive relationship between the size of the wings and time spent aloft. In particular…

We can use maths by including latex between dollar signs, for instance $\theta$.

## 4 Results

Our results are summarized in **?@tbl-modelresults**.

# 5 Discussion

## 5.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

## 5.2 Second discussion point

Please don't use these as sub-heading labels - change them to be what your point actually is.

## 5.3 Third discussion point

## 5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

# Appendix

## A Additional data details

## References


Alexander, Rohan. 2023. *Telling Stories with Data*. Chapman; Hall/CRC. https://tellingstorieswithdata.com/.

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. "rstanarm: Bayesian applied regression modeling via Stan." https://mc-stan.org/rstanarm/.

Horst, Allison Marie, Alison Presmanes Hill, and Kristen B Gorman. 2020. *palmerpenguins: Palmer Archipelago (Antarctica) penguin data*. https://doi.org/10.5281/zenodo.3960218.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Toronto Shelter & Support Services. 2024. *Deaths of Shelter Residents*. https://open.toronto.ca/dataset/deaths-of-shelter-residents/.