Understanding Suicide Rates: Exploring Gender and Age Patterns That Lead to Various Risk Factors Associated with Suicidal Behaviour*

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This paper utilizes data from Statistics Canada, retrieving data related to the Suicide Rates. Analysing the relationship with gender, it is shown that suicide rates tend to be higher in male rather than female. However, suicide rates vary between gender through age, as we find that adolecent females may have a higher rate for suicidal attempts. The results of these findings aids policymakers, public health officials, and mental health professionals to develop a more effective and strategic suicide prevention tailored for the population.

1 Introduction

Suicide is a significant worldwide concern as it concerns individuals, friends, families, and communities. Understanding the factors of suicide is crucial as it extends beyond a loss of a life and onto ongoing world problems like mental health. Hence understanding factors that contribute to suicide is critical into developing prevention strategies within the public health officials and professionals.

The complexity of suicide roots from various factors such as vulnerabilities, social determinants, cultural norms, and mental health being the lead cause for suicides. Moreover, suicides are varied from different demographic groups such as age and gender. Which highlights the need for specified research that consider these variables with suicide. Analyzing the relationship between how these factors play part in suicide rates can help further come up with answers and measures for a better future.

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*Code and data are available at: https://github.com/sarahhhh02/final-paper.git

In this paper, we aim to explore the issues of suicide, carefully focusing on how age and gender play into its rates through a linear regression. The estimand here is how age and gender are related to the risk factors of suicides. Meaning, how they play into determining which group of individuals are at high suicidal risk. We will draw data from Statistics Canada, specifically focusing in Canadian suicide rates in 2019.

2 Data

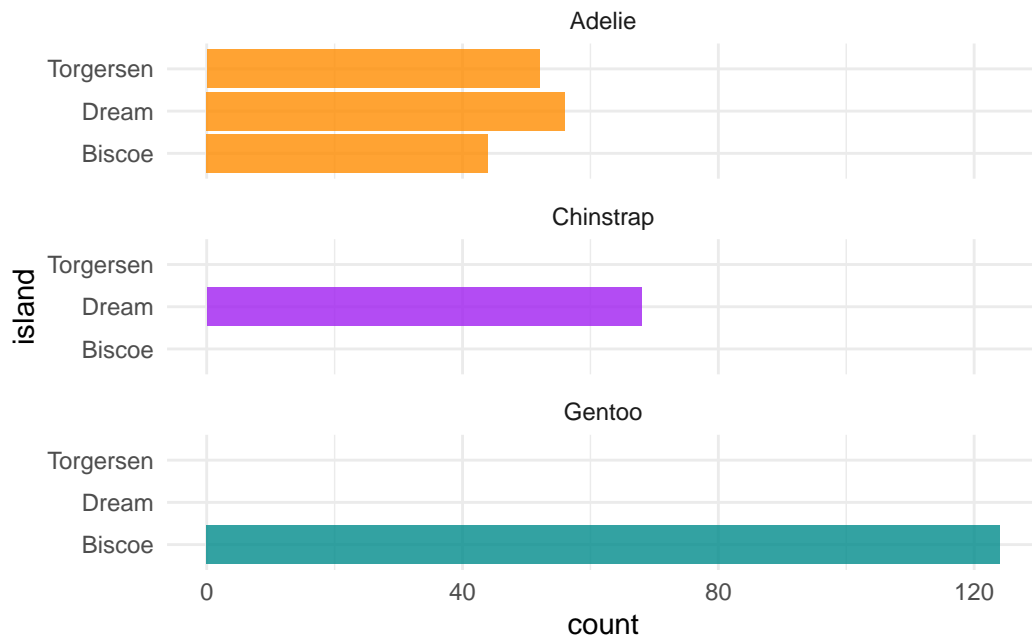Some of our data is of penguins (Figure 1), from Horst, Hill, and Gorman (2020).

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.)

Talk way more about it.

3 Model

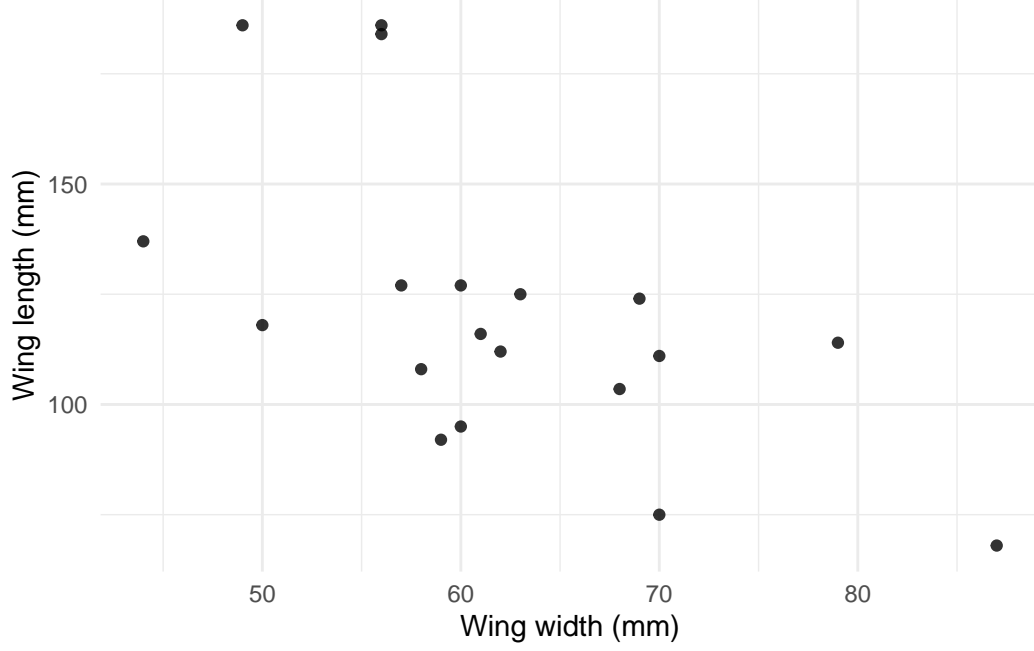The goal of our modelling strategy is twofold. Firstly,...

Figure 2: Relationship between wing length and width

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix B.

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i|\mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$
$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$
$$\sigma \sim \text{Exponential}(1) \tag{6}$$

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`.

Table 1: Explanatory models of flight time based on wing width and wing length

	First model
(Intercept)	1.12
	(1.70)
length	0.01
	(0.01)
width	−0.01
	(0.02)
Num.Obs.	19
R2	0.320
R2 Adj.	0.019
Log.Lik.	−18.128
ELPD	−21.6
ELPD s.e.	2.1
LOOIC	43.2
LOOIC s.e.	4.3
WAIC	42.7
RMSE	0.60

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 θ.

4 Results

Our results are summarized in Table 1.

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

5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

Appendix

A Additional data details

B Model details

B.1 Posterior predictive check

In Figure 3a we implement a posterior predictive check. This shows...

In Figure 3b we compare the posterior with the prior. This shows...
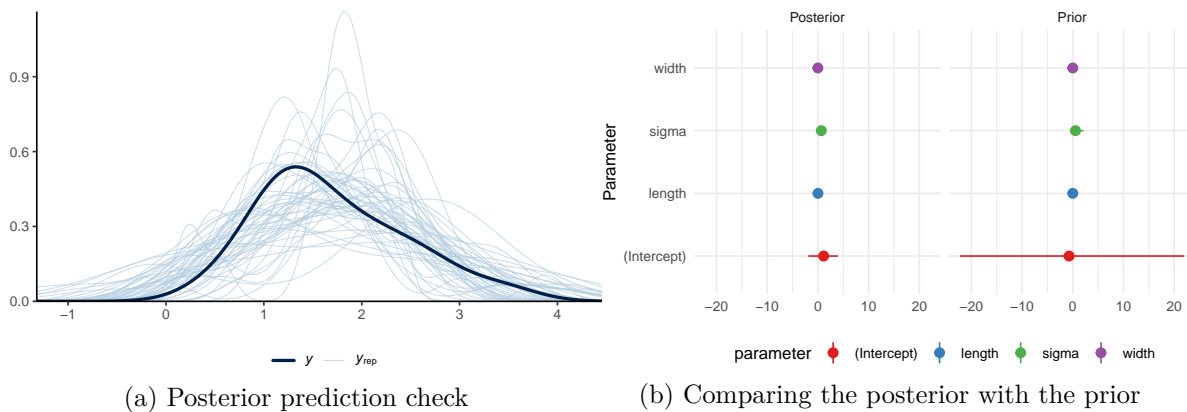

(a) Posterior prediction check

(b) Comparing the posterior with the prior

Figure 3: Examining how the model fits, and is affected by, the data

B.2 Diagnostics

Figure 4a is a trace plot. It shows... This suggests...

Figure 4b is a Rhat plot. It shows... This suggests...
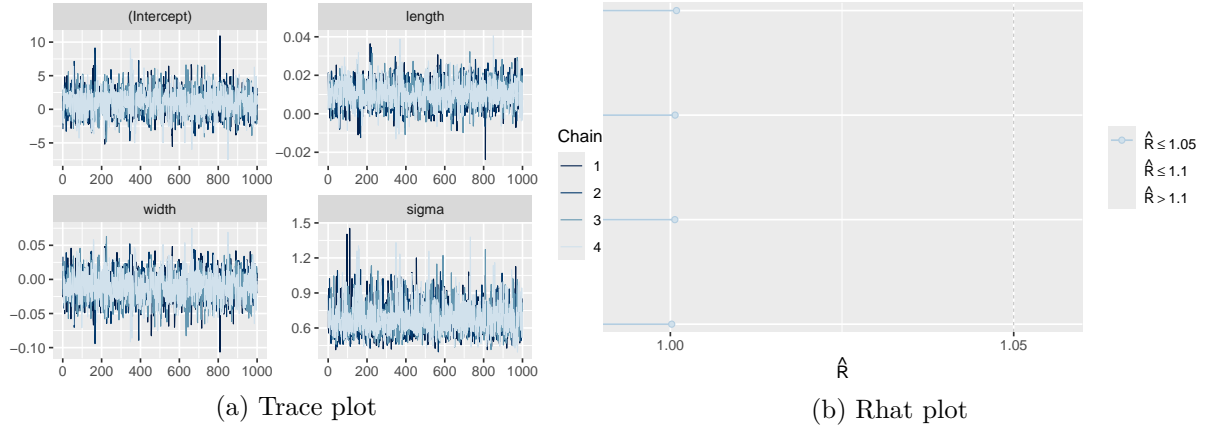
(a) Trace plot (b) Rhat plot

Figure 4: Checking the convergence of the MCMC algorithm

References

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/.