Number of COVID-19 Cases Around the World*

Investigating the number of COVID-19 Cases, Tests, and Deaths by Country, Region, Age, and Sex

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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) to analyze the data and to create graphs and models. Th packages that were used include tidyverse (Wickham, Averick, et al. 2023), tidyr (Wickham, Henry, and Vaughan 2023), dplyr (Wickham, François, et al. 2023), and rstanarm (Gabry et al. 2023). Our data (Contributor(s) 2022) was obtained from COVerAGE-DB. The data anlysis was conducted based on the guidance of Alexander (2023).

Overview text

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

2.2 Measurement

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

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 (**?@fig-bills**), from (**palmerpenguins?**).

Talk more about it.

And also planes (**?@fig-planes**). (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.

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.

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 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 Gabry et al. (2023). We use the default priors from `rstanarm`.

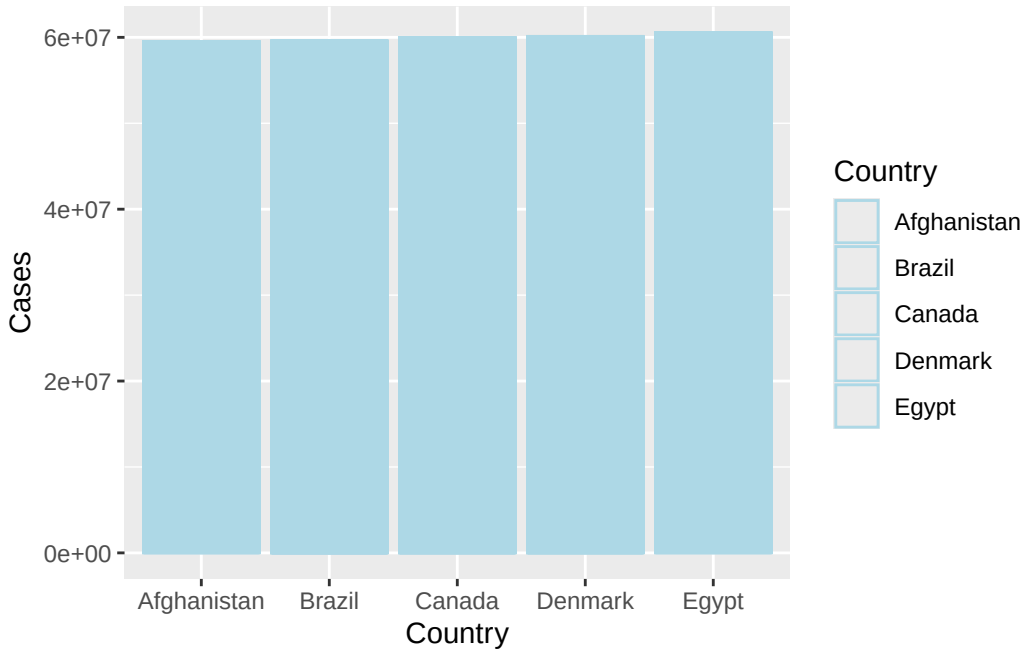
3.1.1 Model justification

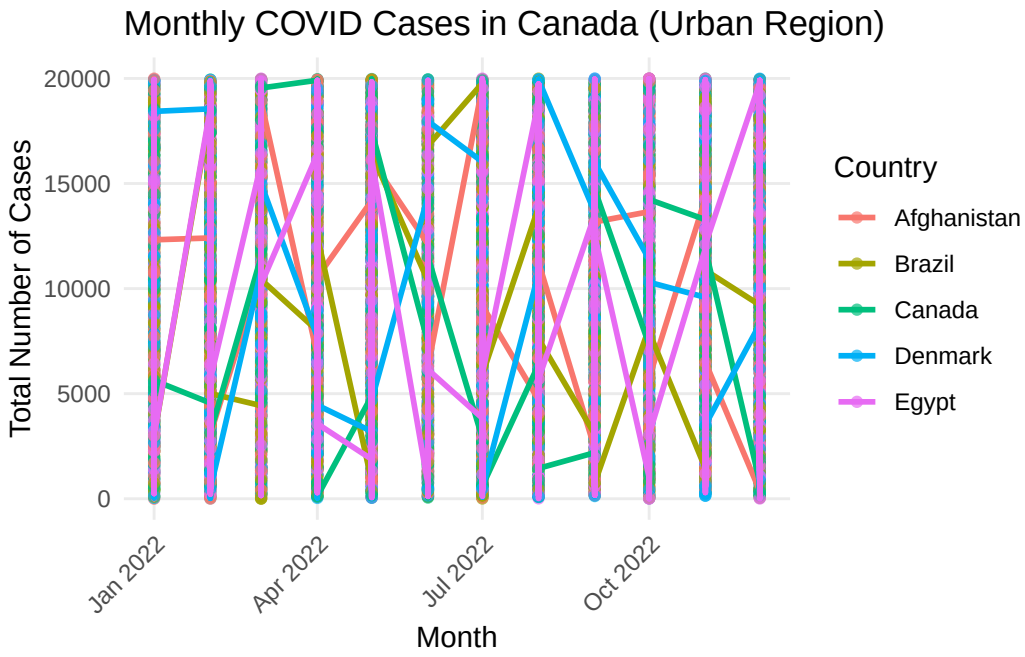
We expect a positive relationship between the size of the wings and time spent aloft. In particular...

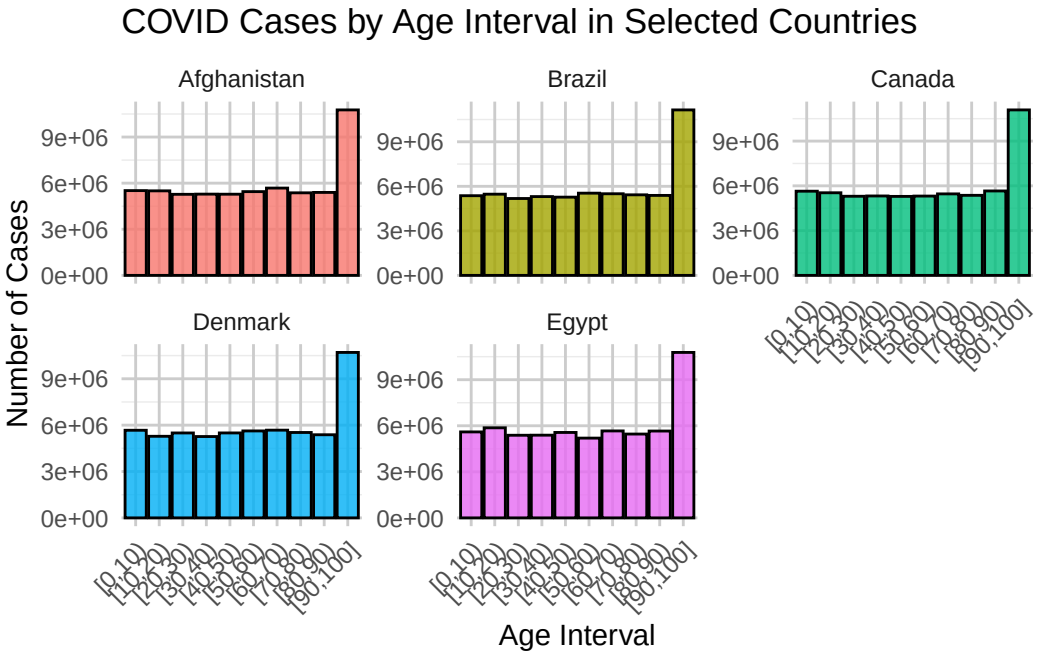
We can use maths by including latex between dollar signs, for instance θ.

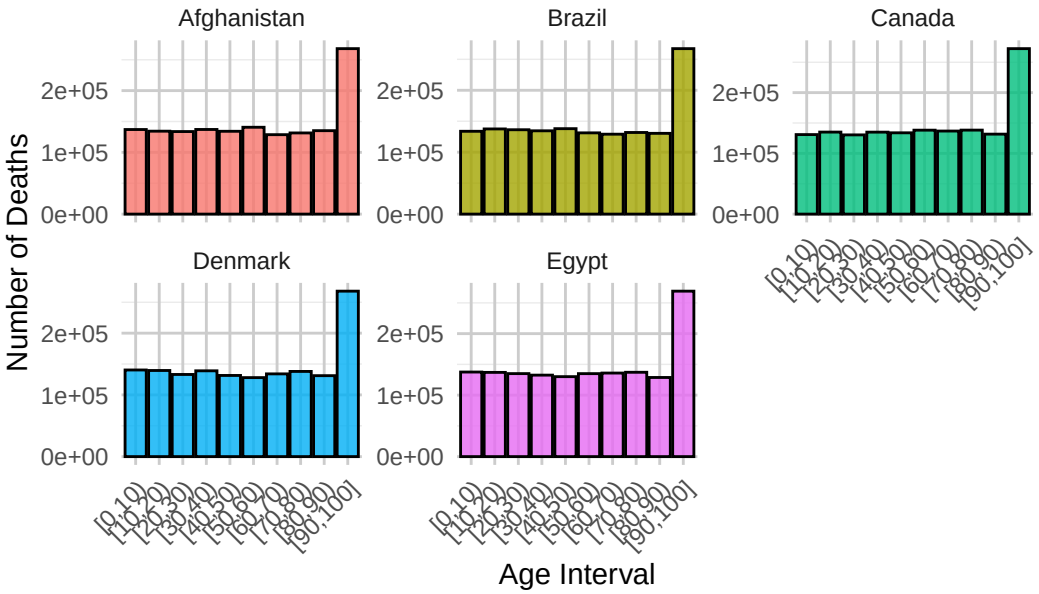
4 Results

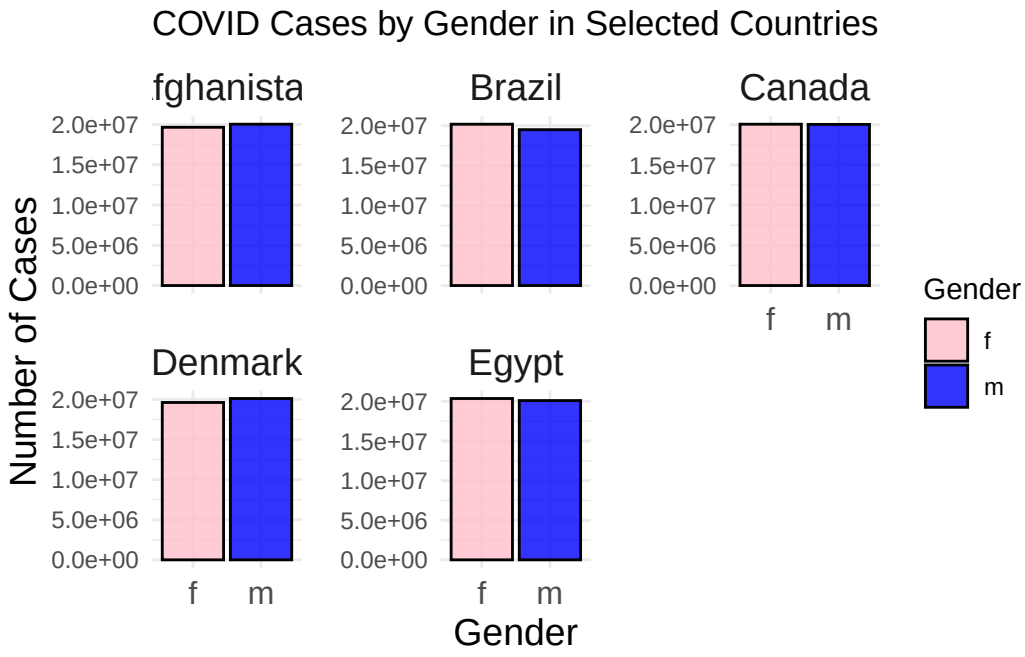
Our results are summarized in **?@tbl-modelresults**.

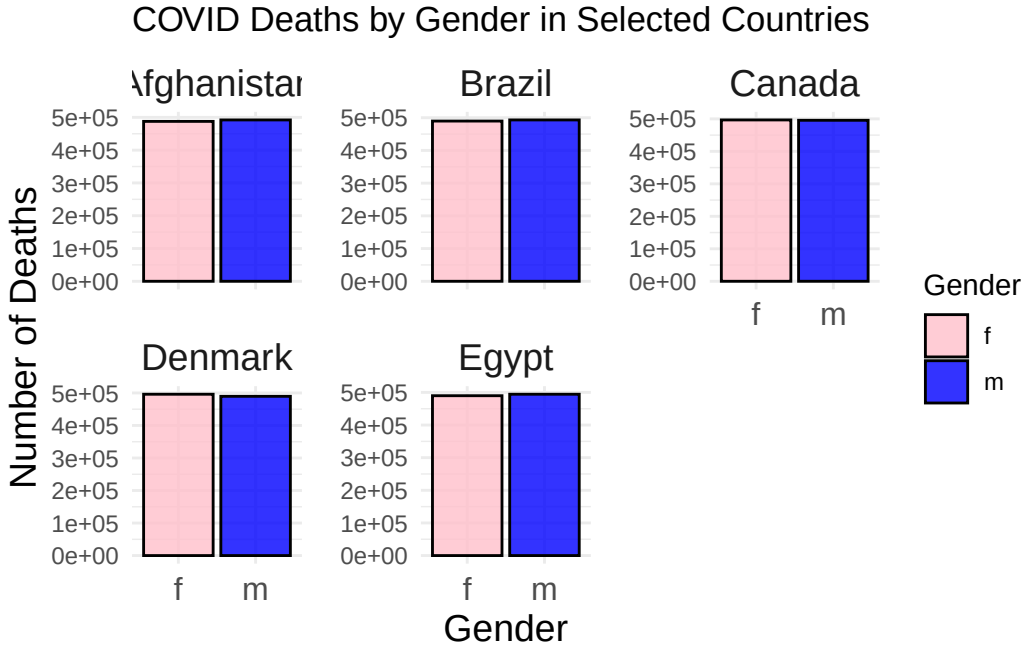

6e+07
4e+07
2e+07
0e+00
Cases
Afghanistan
Brazil
Canada
Denmark
Egypt
Country
Country
Afghanistan
Brazil
Canada
Denmark
Egypt

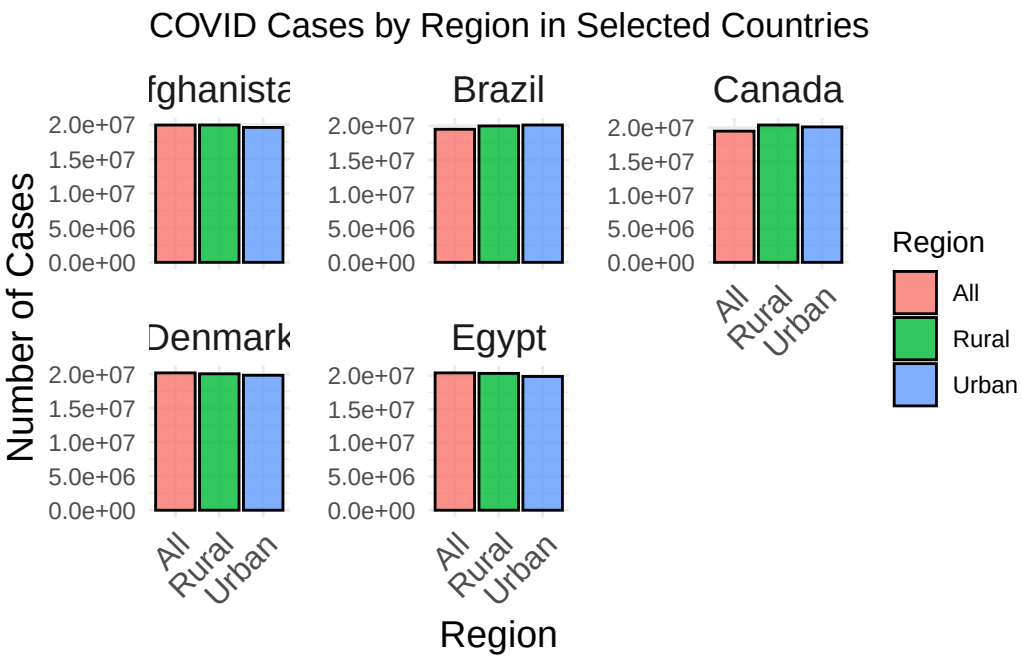

Monthly COVID Cases in Canada (Urban Region)
20000
15000
10000
5000
0
Total Number of Cases
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Month
Country
Afghanistan
Brazil
Canada
Denmark
Egypt


COVID Cases by Age Interval in Selected Countries
Afghanistan
Brazil
Canada
Denmark
Egypt
Number of Cases
9e+06
6e+06
3e+06
0e+00
[0,10)
[10,20)
[20,30)
[30,40)
[40,50)
[50,60)
[60,70)
[70,80)
[80,90)
[90,100]
Age Interval


COVID Deaths by Age Interval in Selected Countries
Afghanistan
Brazil
Canada
Denmark
Egypt
Number of Deaths
2e+05
1e+05
0e+00
[0,10)
[10,20)
[20,30)
[30,40)
[40,50)
[50,60)
[60,70)
[70,80)
[80,90)
[90,100]
Age Interval


COVID Cases by Gender in Selected Countries
fghanista
Brazil
Canada
Denmark
Egypt
Number of Cases
2.0e+07
1.5e+07
1.0e+07
5.0e+06
0.0e+00
f
m
Gender


COVID Deaths by Gender in Selected Countries
Afghanistan
Brazil
Canada
Denmark
Egypt
Number of Deaths
5e+05
4e+05
3e+05
2e+05
1e+05
0e+00
f
m
Gender



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

B Model details

B.1 Posterior predictive check

B.2 Diagnostics

References

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

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Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2023. *Tidyverse: Easily Install and Load the 'Tidyverse'*. https://CRAN.R-project.org/package=tidyverse.

Wickham, Hadley, Romain François, Lionel Henry, and Kirill Müller. 2023. *Dplyr: A Grammar of Data Manipulation*. https://CRAN.R-project.org/package=dplyr.

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