My title*

My subtitle if needed

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

Table of contents

*Code and data are available at: LINK.

1 Introduction

This paper begins with an Introduction framing the impact of economic downturns on work hours. It is followed by the Data section detailing methodology and cleaning efforts. In the Results, we analyze work hours and nonresponse rates, leading to the Discussion on labour market responses to crises, including the impact of COVID-19, and addressing ethical issues. We later acknowledge our paper's Limitations, suggest paths for Future Research, especially on enhancing response rates, and conclude with a synthesis of our insights. The Appendix provides further survey information.

2 Data

The paper uses data collected from the US General Social Survey (GSS) from NORIC at the University of Chicago ("General Social Survey" 2024). From the dataset, this paper focuses on the "number of hours worked last week" variable, from the years 1992 to 2022. This longitudinal approach allows us to compare labour dynamics across different economic downturns, including the 1998 Asian Financial Crisis, the 2008 Global Financial Crisis, and the COVID-19 pandemic in 2020.

2.1 Source Data

The data was downloaded and filtered for the selected variables from the selected data variables from GSS[1]. The data cleaning was performed based on value definitions as defined in the GSS codebooks (NORC 2018). One of the variable names `response` is renamed to be more informative (Table 1).

For the analysis, we retrieved the following data as described in Table 1.

[1]https://gss.norc.org/documents/stata/GSS_stata.zip

Table 1: Source data retrieved from GSS

Variable	New Name	Description	Example
ID_	id	Response ID	1
YEAR	year	Year of the Data Recorded	1977
SEX	sex	Respondent's gender	Female
AGE	age	Respondent's age	25
HEALTH	health	Respondents' health condition	Good
PHYSHLTH	phys_days	Days of Respondents' physical health being not good	15
MNTLHLTH	ment_days	Days of Respondents' mental health being not good	20
DEPRESS	depress	Whether respondents have been told having depression	Yes

2.2 Data Cleaning

The data was cleaned by using the open source statistically programming language R (R Core Team 2024), with libraries `tidyverse` (Wickham et al. 2019), `ggplot2` (Wickham 2016), `dplyr` (Wickham et al. 2022), `readr` (Wickham, Hester, and Bryan 2022), `tibble` (Muller and Wickham 2022), `here` (Müller 2020), `kableExtra` (Zhu 2021), `janitor` (Firke 2023), `arrow` (Richardson et al. 2024), and `knitr` (Xie 2014).

2.3 Survey Methodology

some words

2.4 Demographic Variables

Table 2: Counted days of Physical and Mental unwellness of Population by Age and Gender Groups

ID	Gender	Age	Physical Unwellness	Mental Unwellness	Age Cohort
1	Female	25	0	0	20-39
2	Male	43	0	0	40-59
3	Female	30	0	2	20-39
4	Female	55	0	0	40-59
5	Male	37	0	30	20-39

6	Male	47	0	0	40-59

2.5 Mental and Physical Unwellness and Depression Diagnosis

Table 3: Counted days of Physical and Mental unwellness with Depression Diagnosis

ID	Physical Unwellness	Mental Unwellness	Depression Diagnosis
1	0	0	2
2	0	0	1
4	0	0	2
14	0	0	2
16	14	7	2
19	0	0	2

2.6 Mental Unwellness and General Health Status

Table 4: Counted days of Mental unwellness with General Health Status

ID	Mental Unwellness	General Health
1	0	1
2	0	2
3	2	2
5	30	2
6	0	1
9	5	2

2.7 Non-response Rate

??? maybe include a table of non-response rate

Some of the questions in the dataset are not included resulting no responses collected in certain years, while the other responses were collected. This fact requires extra attention when cleaning and handling since the number of available responses will decrease when additional variables are added. Hence, an additional sub set of the data that only includes counted days of mental and physical un-wellness in the past 30 days is also included for only speculating these two variables.

Table 5: Counted days of Mental unwellness with General Health Status

ID	Physical Unwellness	Mental Unwellness
1	0	0
2	0	0
3	0	2
4	0	0
5	0	30
6	0	0

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 2024) using the `rstanarm` package of Goodrich et al. (2024). We use the default priors from `rstanarm`.

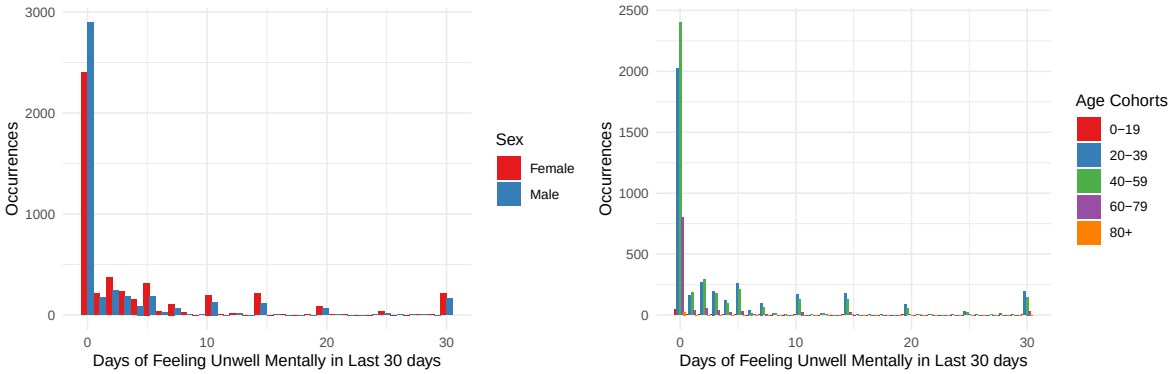
3.1.1 Model justification

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

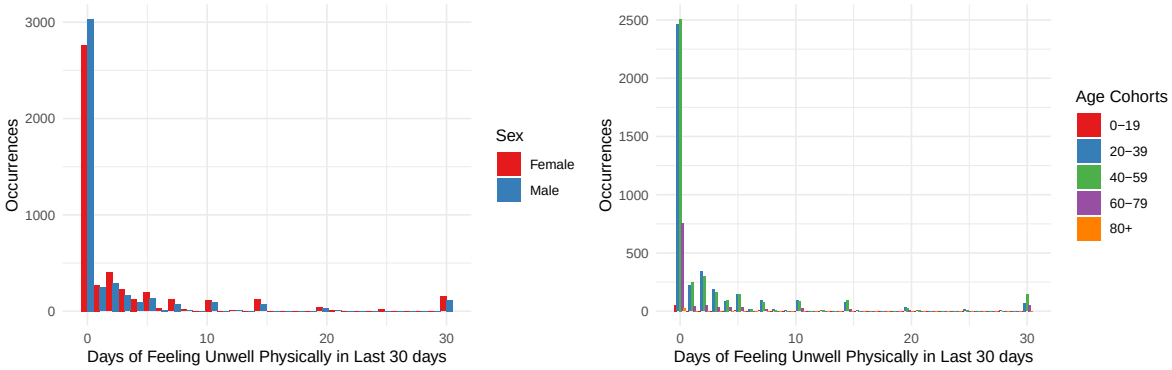
Our results are summarized in Table 6.



(a) Gender

(b) Age cohorts

Figure 1: Gender and Age of People Apprehended Visulization Year-Depended



(a) Gender

(b) Age cohorts

Figure 2: Gender and Age of People Apprehended Visulization Year-Depended22

4.1 Depression Playing an Role

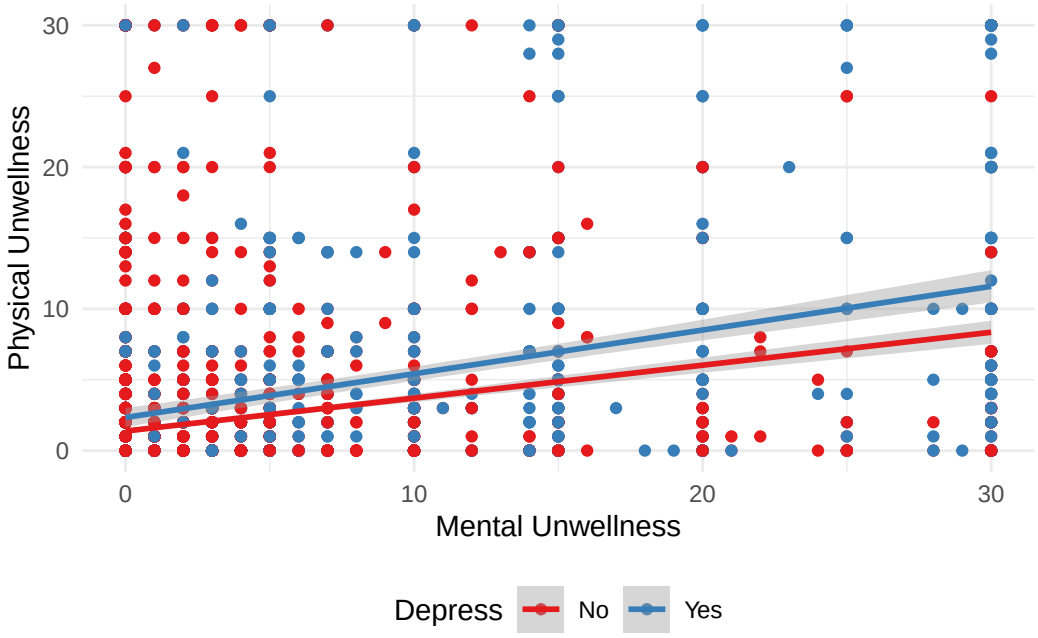


Figure 3: Counts of Days Feeling Unwell in Last 30 Days

4.2 Mental Health and Health in General

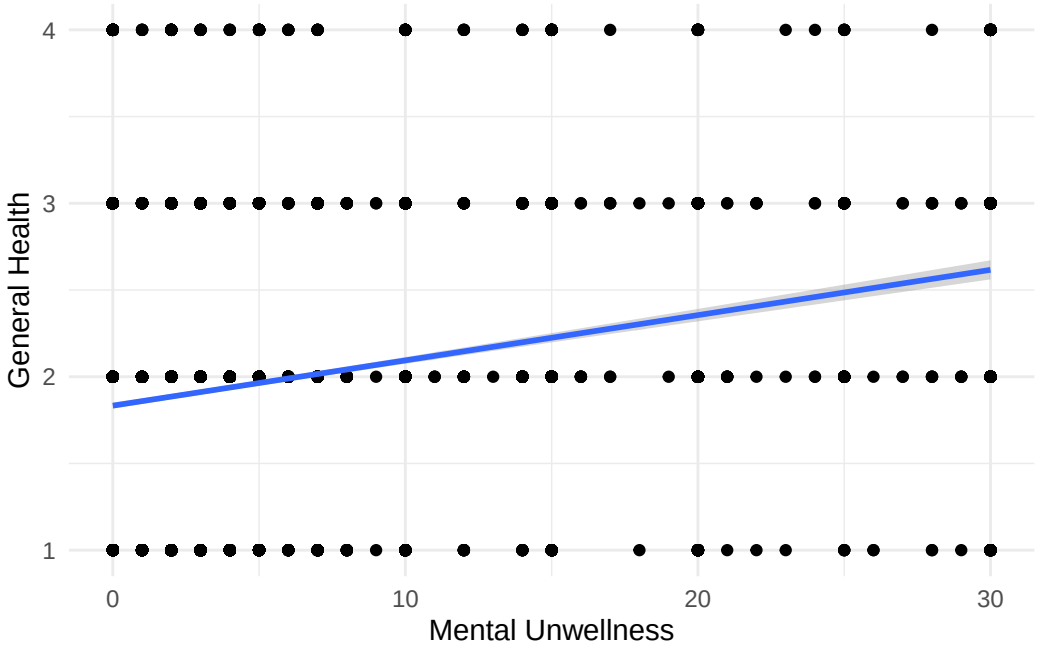


Figure 4: Counts of Days Feeling Unwell in Last 30 Days

Table 6: Explanatory models of flight time based on wing width and wing length

	First model
(Intercept)	4.15
	(0.43)
ment_days	0.27
	(0.01)
depress	−1.43
	(0.22)
Num.Obs.	4527
R2	0.132
R2 Adj.	0.130
Log.Lik.	−14 351.092
ELPD	−14 358.6
ELPD s.e.	118.8
LOOIC	28 717.1
LOOIC s.e.	237.7
WAIC	28 717.1
RMSE	5.76

4.3 Model Results

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.

A Appendix

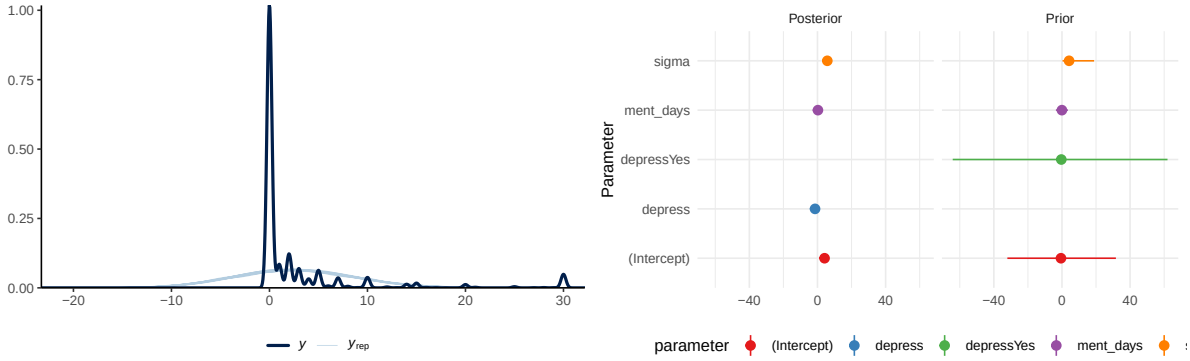
A.1 Additional data details

B Model details

B.1 Posterior predictive check

In Figure 5a we implement a posterior predictive check. This shows...

In Figure 5b we compare the posterior with the prior. This shows...



(a) Posterior prediction check

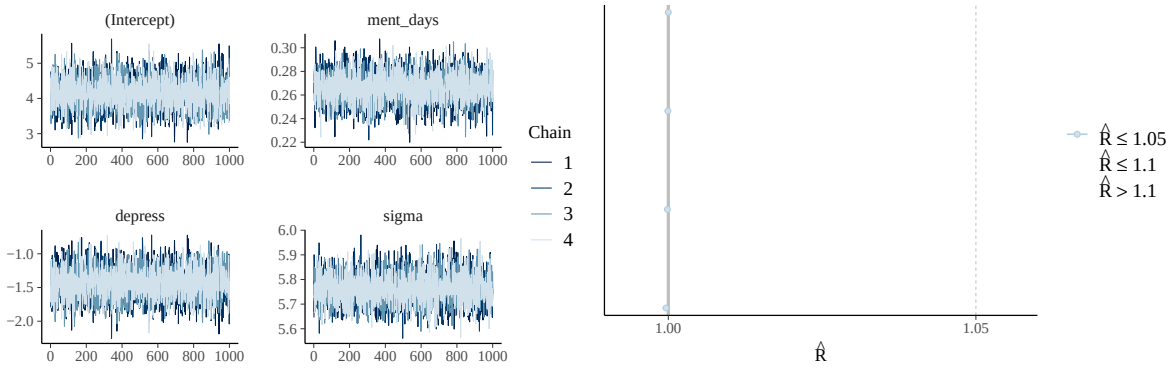
(b) Comparing the posterior with the prior

Figure 5: Examining how the model fits, and is affected by, the data

B.2 Diagnostics

Figure 6a is a trace plot. It shows... This suggests...

Figure 6b is a Rhat plot. It shows... This suggests...



(a) Trace plot

(b) Rhat plot

Figure 6: Checking the convergence of the MCMC algorithm

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