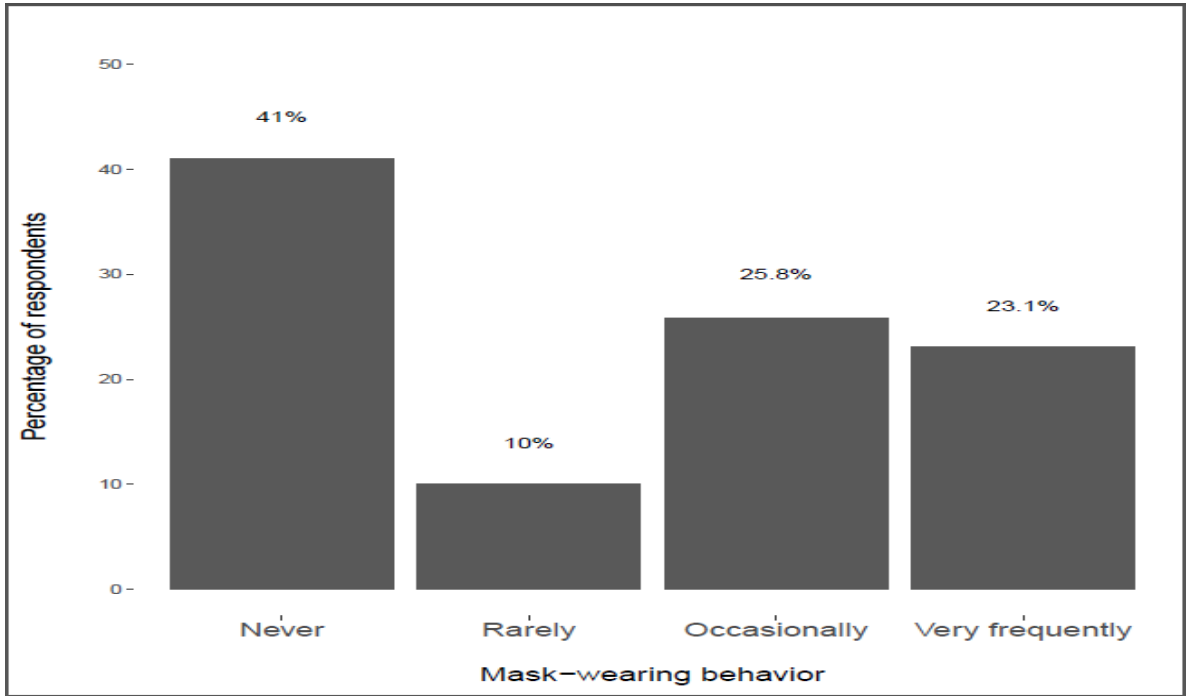
Voluntary Adoption of Social Welfare-enhancing Behavior

Mask-wearing in Spain during the COVID-19 outbreak

Original Paper findings

- The study tries to understanding the social behavior of people in Spain during the COVID-19 in terms of mask wearing as way of containing and controlling the spread of the disease.

- 41 % of the respondents never wear mask
- 10% of the respondents rarely wear mask
- 25.8% occasionally wear mask and
- 23. 1% very frequently wear mask



Original findings (Ordinal Logistic Regressions)

- The model is used to determine the relationship between Demographic Characteristics and Mask use.
- The Demographic variables used are gender , age_cat , educ_cat, occup_cat, time_home and work_affect
- Age category affect the mask use
- There associated P-values are < 0.05 significance level

```
#Table 1: Ordinal Logistic Regressions Investigating the Association Between Demographic Characteristics and Mask
Use

summary(demo_ordinal <- polr(as.factor(facemask) ~ as.factor(gender) + as.factor(age_cat) + as.factor(educ_cat) +
as.factor(occup_cat) + time_home + as.factor(work_affect), data = covid19, Hess=TRUE))

(sumtable <- coef(summary(demo_ordinal)))
p <- pnorm(abs(sumtable[, "t value"]), lower.tail = FALSE) * 2

(ci <- confint(demo_ordinal))

TABLE_1 <- cbind(round(exp(cbind(OR = coef(demo_ordinal), ci)), 2), p = round(p[1:length(coef(demo_ordinal))], 3))

print(TABLE_1)
```

	OR	2.5 %	97.5 %	p
as.factor(gender)1	0.98	0.87	1.11	0.784
as.factor(age_cat)1	1.86	1.40	2.48	0.000
as.factor(age_cat)2	1.87	1.48	2.37	0.000
as.factor(age_cat)3	1.77	1.39	2.24	0.000
as.factor(age_cat)4	1.98	1.55	2.53	0.000
as.factor(age_cat)5	2.26	1.05	4.83	0.035
as.factor(educ_cat)1	0.88	0.73	1.07	0.192
as.factor(educ_cat)2	0.91	0.72	1.15	0.427
as.factor(educ_cat)3	0.77	0.63	0.94	0.010
as.factor(educ_cat)4	0.71	0.56	0.90	0.005
as.factor(occup_cat)2	0.49	0.27	0.91	0.023
as.factor(occup_cat)4	0.54	0.30	0.96	0.036
as.factor(occup_cat)5	0.57	0.32	1.00	0.049
as.factor(occup_cat)7	4.69	2.39	9.28	0.000
as.factor(occup_cat)8	0.66	0.37	1.16	0.147
as.factor(occup_cat)10	0.74	0.41	1.30	0.291
as.factor(occup_cat)12	0.60	0.34	1.03	0.066
as.factor(occup_cat)13	0.84	0.45	1.54	0.563
as.factor(occup_cat)15	0.73	0.39	1.39	0.344
as.factor(occup_cat)16	0.64	0.38	1.07	0.087
as.factor(occup_cat)17	0.87	0.33	2.26	0.773
as.factor(occup_cat)18	0.38	0.20	0.71	0.003
time_home	0.99	0.85	1.14	0.873
as.factor(work_affect)2	1.81	1.18	2.76	0.006
as.factor(work_affect)3	1.96	1.26	3.08	0.003
as.factor(work_affect)4	1.13	0.75	1.72	0.556
as.factor(work_affect)5	1.85	1.21	2.83	0.005

Replication

- To determine the most predictive demographic factors contribution to mask wearing during cavid-19 outbreak in Spain using OLS regression model

- The main research question is: Which are the demographic factors which contributes most to mask wearing during the covid-19 pandemic using non-factor variables.

Hypothesis:

- Null hypothesis: The model with factors independent variables fits the data well

- Alternative hypothesis: The model with non-factor independent variables fits the data well

OLS Regression model

- The build model is as shown below.
-

```r
# Re-estimation using OLS model
model2 <- polr(as.factor(facemask) ~ gender + age_cat + educ_cat + occup_cat + time_home + work_affect, data =
covid19, Hess=TRUE)
```

```
                    Value Std. Error     t value
gender         0.021377255 0.06189038   0.3454051
age_cat        0.131197043 0.02077249   6.3159024
educ_cat      -0.108456332 0.02359409  -4.5967580
occup_cat     -0.007574328 0.00695136  -1.0896182
time_home     -0.084242711 0.07310561  -1.1523427
work_affect    0.067207087 0.02105217   3.1924062
0|1           -0.333386168 0.27800763  -1.1991979
1|2            0.089864463 0.27800629   0.3232462
2|3            1.260448502 0.27898200   4.5180281
Waiting for profiling to be done...
                   2.5 %       97.5 %
gender        -0.09990392   0.142722328
age_cat        0.09054215   0.171979931
educ_cat      -0.15473877  -0.062241516
occup_cat     -0.02119454   0.006058373
time_home     -0.22747052   0.059453869
work_affect    0.02596759   0.108499250
                OR 2.5 % 97.5 %     p
gender        1.02  0.90   1.15 0.730
age_cat       1.14  1.09   1.19 0.000
educ_cat      0.90  0.86   0.94 0.000
occup_cat     0.99  0.98   1.01 0.276
time_home     0.92  0.80   1.06 0.249
work_affect   1.07  1.03   1.11 0.001
```

F-test

- The F-test was conducted to determine the model which fits the data well between the OLS model using factor predictor variables and non-factor predictor variables

- The second model which uses non factor predictor variables is better than the first model

```r
# Check the important model
library(lmtest)
# perform f-test
lrtest(demo_ordinal, model2)
```

```
Likelihood ratio test

Model 1: as.factor(facemask) ~ as.factor(gender) + as.factor(age_cat) +
    as.factor(educ_cat) + as.factor(occup_cat) + time_home +
    as.factor(work_affect)
Model 2: as.factor(facemask) ~ gender + age_cat + educ_cat + occup_cat +
    time_home + work_affect
  #Df  LogLik  Df  Chisq Pr(>Chisq)
1  30 -4893.4
2   9 -4984.0 -21 181.08  < 2.2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Conclusion

- Among the demographic factors: Age, education category and work effect have significant effect on the mask wearing
- A unit increase in age lead to 1.14 units increase in mask wearing on average
- A unit increase in education category and work effect leads to 0.90 and 1.07 units increase in mask wearing on average.
- From the F-test it can be concluded model using non factor predictors fits the data well than the model using factor predictor variables and hence we reject the null hypothesis and accept the alternative hypothesis that the model with non-factor independent variables fits the data well to the data