Analysis of life expectancy

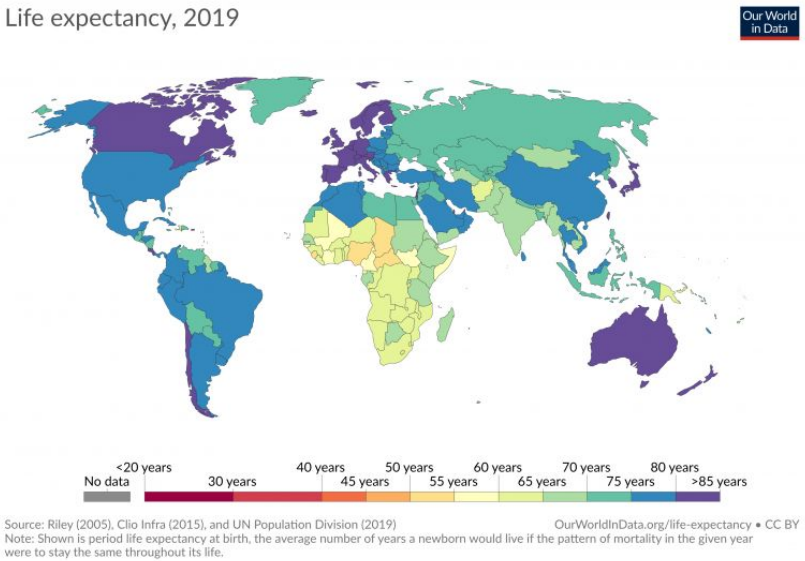
Joona Rantanen

Aalto University

Data

Complicated problem which affects people's lives

Life expectancy is affected by many factors

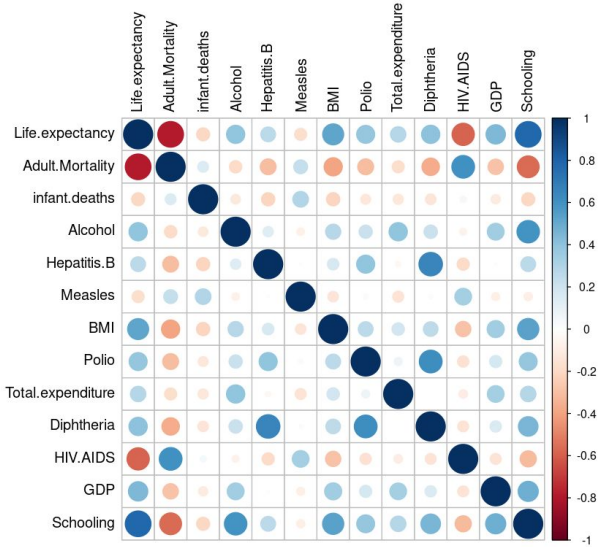


Data

Data from WHO

Year 2010 from all the countries.

12 explanatory variables



Life expectancy predictive model

Linear regression model with normal priors, normal(0,1) for coefficients and normal(70,10) for intercept

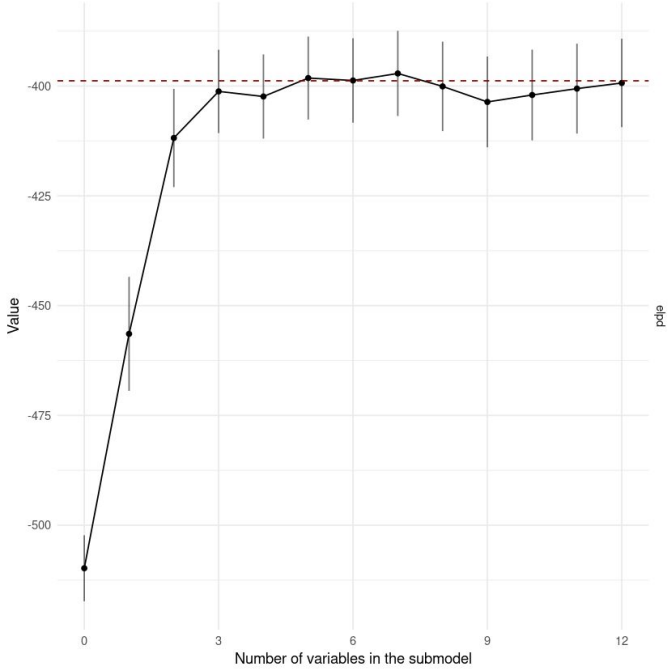
Linear regression model with variable selection and same priors

Models built with and inference run with brms

All convergence diagnostics were good

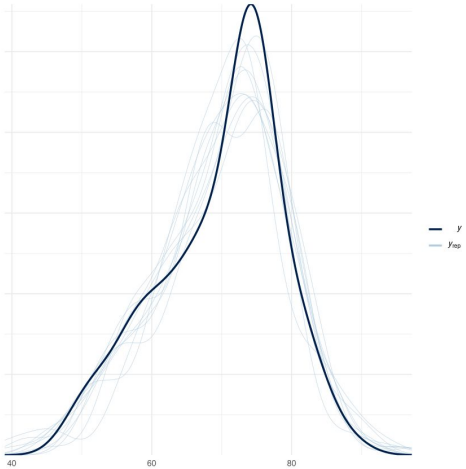
Life expectancy variable selection

Use three variables: Adult mortality, HIV/AIDS and schooling

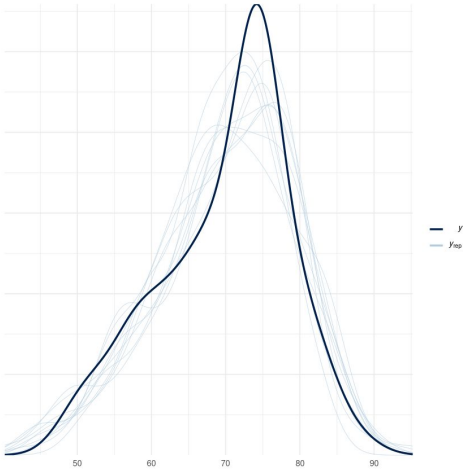


Life expectancy model checking

Model with all the variables



Model with variable selection



Life expectancy model comparison

	elpd_diff	se_diff
fit_all_variables	0.000000	0.000000
fit_varsel_variables	-1.647883	3.536808

Conclusion

Life expectancy can be predicted with linear model

Using only three variables adult mortality, HIV/AIDS and schooling gives same predictive accuracy

joona.rantanen@aalto.fi

Additional information

```
fit_multiple_variables <- brm(Life.expectancy ~
Adult.Mortality + Alcohol + infant.deaths +
Hepatitis.B + Measles + BMI  + Polio +
Total.expenditure + Diphtheria + HIV.AIDS + GDP
+ Schooling , data = data, family = gaussian(),
prior = c(set_prior("normal(0,1)", class = "b"),
set_prior("normal(70,10)", class = "Intercept")),
iter=4000, control = list(max_treedepth = 20))

fit_varsel_variables <- brm(Life.expectancy ~
Adult.Mortality + HIV.AIDS + Schooling , data =
data,family = gaussian(), prior =
c(set_prior("normal(0,1)", class = "b"),
set_prior("normal(70,10)", class = "Intercept")),
iter=4000, control = list(max_treedepth = 20))
```