

Week 6: Linear regression II

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What are we going to do:

- Extract R^2 from `lm` object
- How to extract fitted values and residuals from `lm` object
- Calculate R^2 ourselves
- Plot residuals versus TFR values
- Calculate correlation between residuals and TFR
- Do log transforms and regressions with those

```
library(tidyverse)
library(here)
country_ind <- read_csv(here("data/country_indicators.csv"))
```

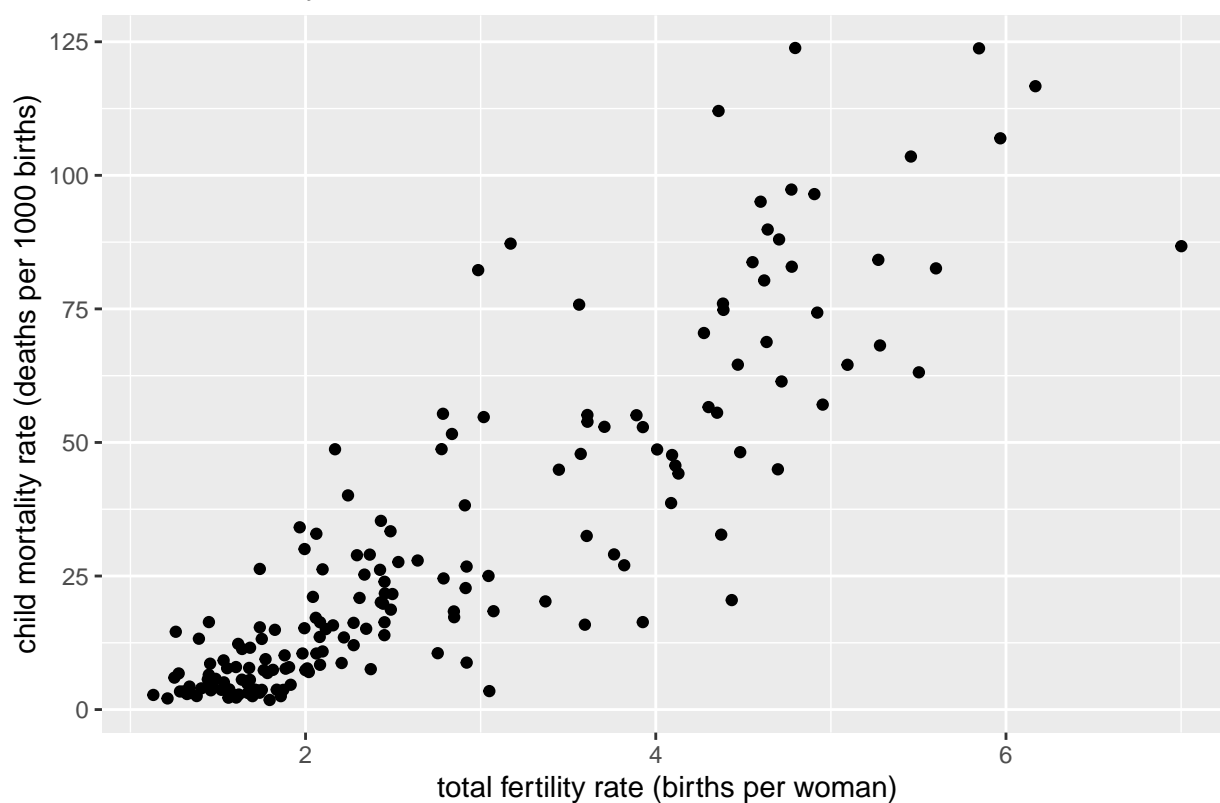
Filter to just be 2017

```
country_ind_2017 <- country_ind %>% filter(year==2017)
```

Look at the observed relationship between TFR and child mortality

```
ggplot(country_ind_2017, aes(tfr, child_mort)) +
  geom_point()+
  labs(title = "Child mortality versus TFR, 2017",
       x = "total fertility rate (births per woman)",
       y = "child mortality rate (deaths per 1000 births)")
```

Child mortality versus TFR, 2017



Fit SLR

```
childmort_tfr_model <- lm(formula = child_mort~tfr, data = country_ind_2017)
childmort_tfr_model
```

```
##
## Call:
## lm(formula = child_mort ~ tfr, data = country_ind_2017)
##
## Coefficients:
## (Intercept)      tfr
##      -25.83      20.36
```

Extract R^2

Extract fitted values and residuals

Calculate R^2 by hand

- Calculate \bar{Y} (i.e. the mean of child mortality)
- Hence calculate SSM
- Calculate SSR
- Hence calculate SST and R^2

Plot residuals versus TFR

Calculate correlation

Take log transforms

Repeat regression and residual analysis