Week 6

Quarto for Data Communication

R Package jmpwashdata

For this analysis we will use the jmpwashdata R Package by Dickinson (2021). The package contains all data compiled by the WHO/UNICEF Joint Monitoring Programme (JMP).

```
library(jmpwashdata)
library(tidyverse)
library(gt)
library(ggthemes)
```

World Bank income groups

We will also use the World Bank income classification for 218 countries. This data was downloaded and stored as an XLSX file using an R script in src.

```
income_groups_df <- read_rds(here::here("data/wb-income-groups.rds"))</pre>
```

Basic Sanitation & GDP

Data for the most recent year, basic sanitation in urban areas, calculate urban population, and join income groups.

```
# Perform data manipulation operations on the jmp_wld_sanitation data frame
jmp_wld_sanitation_gdp_income <- jmp_wld_sanitation |>
    # Filter the rows where the year column is equal to the maximum year value
    filter(year == max(year)) |>
    # Select the columns from name to prop_u and the san_bas_u column
```

```
select(name:prop_u, san_bas_u) |>
# Create a new column named pop_u
mutate(pop_u = pop_n * 1000 * prop_u / 100) |>
# Drop the pop_n and prop_u columns
select(-pop_n, -prop_u) |>
# Perform a left join with the income_groups_df data frame
left_join(income_groups_df) |>
# Drop the rows that have missing values in the san_bas_u & income_group cols
drop_na(san_bas_u, income_group)
```

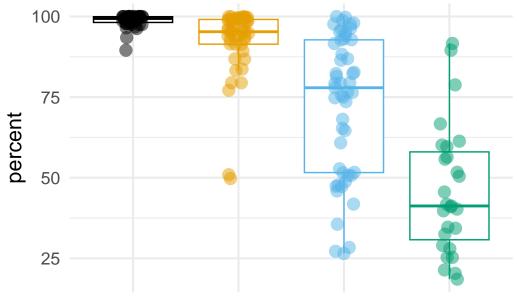
Basic Sanitation Uganda

```
# Create a vector of color codes
color_scale_sanitation <- c("#8cce8f", "#fff381", "#ffda5a", "#ffbc02")</pre>
# Create a vector of sanitation indicators
fct_sanitation <- c("basic", "limited", "unimproved", "open defecation")</pre>
# Perform data manipulation operations on the jmp_wld_sanitation data frame
jmp_uga_sanitation <- jmp_wld_sanitation |>
  # Filter the rows where the iso3 column is equal to "UGA" and the year column
  # is equal to 2000 or 2020
 filter(iso3 == "UGA") |>
  filter(year == 2000 | year == 2020) |>
  # Select the name, iso3, year, and columns from san bas n to san od n
  select(name, iso3, year, san_bas_n:san_od_n) |>
  # Reshape the data frame from wide to long format
  pivot_longer(cols = san_bas_n:san_od_n,
               names_to = "indicator",
               values to = "percent") |>
  # Rename the indicator column based on the values of the san_bas_n to san_od_n
  # columns
  mutate(indicator = case_when(
    indicator == "san bas n" ~ "basic",
    indicator == "san_lim_n" ~ "limited",
    indicator == "san_unimp_n" ~ "unimproved",
    indicator == "san_od_n" ~ "open defecation"
  )) |>
  # Convert the indicator column to a factor with levels specified by the
  # fct_sanitation vector
```

```
mutate(indicator = factor(indicator, level = fct_sanitation))
```

Income

Figure 1 is a box- and jitterplot of countries with percentages of populations with access to basic sanitation in 2020 grouped by income classifications.



High incolored middle incolored inco

Figure 1: Access to sanitation (urban) in 2020 by income classifications.

Regions

Table 1 below shows urban sanitation indicators for global regions in 2020.

Table 1: Urban sanitation indicators for global regions.

| | basic | limited | ${\bf unimproved}$ | open defecation |
|----------------------------------|-------|---------|--------------------|-----------------|
| Central and Southern Asia | 79% | 17% | 3% | 1% |
| Eastern and South-Eastern Asia | 95% | 3% | 2% | 1% |
| Europe and Northern America | 99% | 1% | 1% | 0% |
| Latin America and the Caribbean | 93% | 4% | 3% | 0% |
| Northern Africa and Western Asia | 95% | 2% | 2% | 0% |
| Oceania | 71% | 9% | 17% | 3% |
| Sub-Saharan Africa | 46% | 32% | 17% | 5% |
| Fragile or Extremely Fragile | 62% | 22% | 13% | 3% |
| Least Developed Countries | 48% | 29% | 20% | 4% |
| Landlocked Developing Countries | 62% | 22% | 14% | 2% |
| Small Island Developing States | 83% | 10% | 5% | 2% |
| World | 88% | 8% | 3% | 1% |

Uganda

Figure 2 below shows the sanitation ladder for Uganda.

Uganda: sanitation ladder (national)

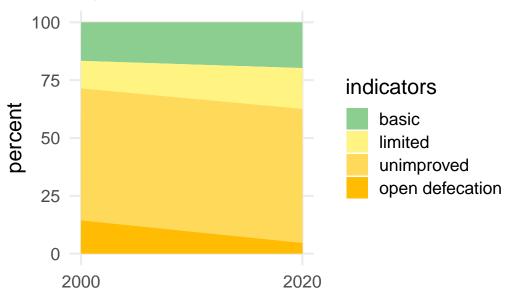


Figure 2: Sanitation indicators for Uganda on a national level.

Dickinson, Nicolas. 2021. "Jmpwashdata: WHO/UNICEF Joint Monitoring Programme Water and Sanitation Data."