```
#demonstration of tidy data
library(tidyverse)

table1

table2

table3

table4a

table4b

table1 %>%
+     mutate(rate = cases / population * 10000)

table1 %>%
+     count(year, wt = cases)

#demonstration of simple plotting using ggplot2
library(ggplot2)

ggplot(table1, aes(year, cases)) +
+     geom_line(aes(group = country), colour = "grey50") +
+     geom_point(aes(colour = country))

#individual left joining of tables
table4a %>%
+     gather(`1999`, `2000`, key = "year", value = "cases")

table4b %>%
+     gather(`1999`, `2000`, key = "year", value = "population")

left_join(tidy4a, tidy4b)

#left joining tables
tidy4a <- table4a %>%
+     gather(`1999`, `2000`, key = "year", value = "cases")

tidy4b <- table4b %>%
+     gather(`1999`, `2000`, key = "year", value = "population")

left_join(tidy4a, tidy4b)

#spread function
spread(table2, key = type, value = count)
```