

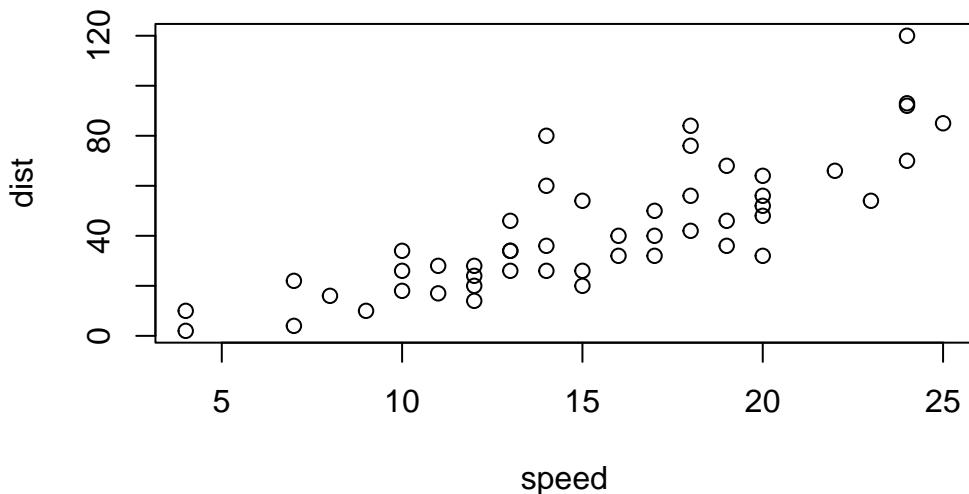
# Lab05

Bomin Xie

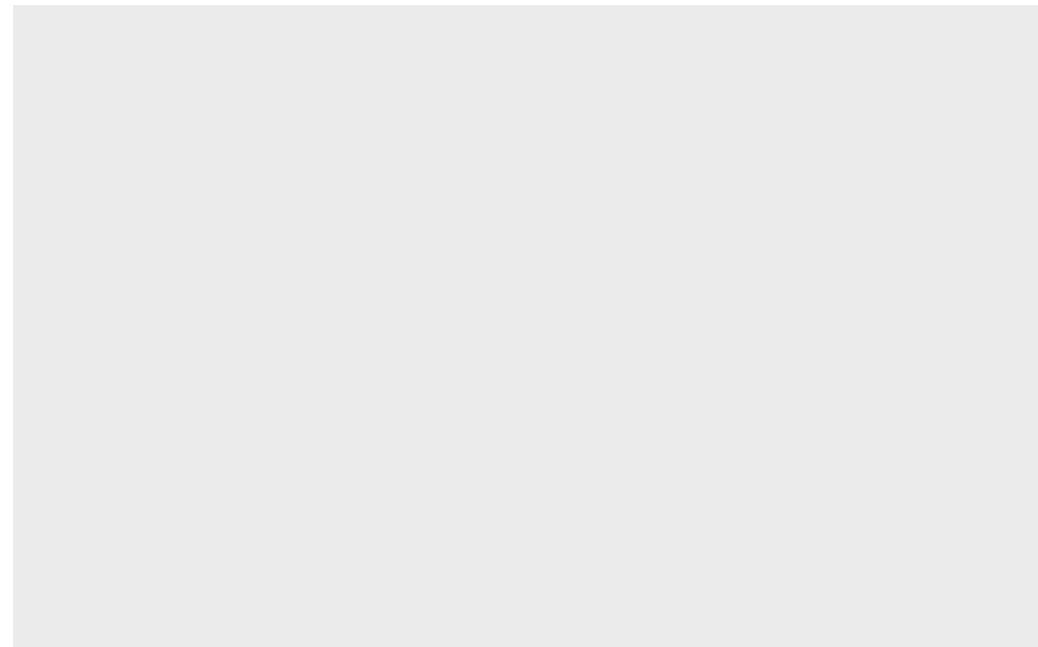
## Week 4 Lab 5

Initiation of ggplot2, and visit the data set:

```
#install.pockages("ggplot2")
library(ggplot2)
#View(cars)
plot(cars) # A quick R-based plot
```

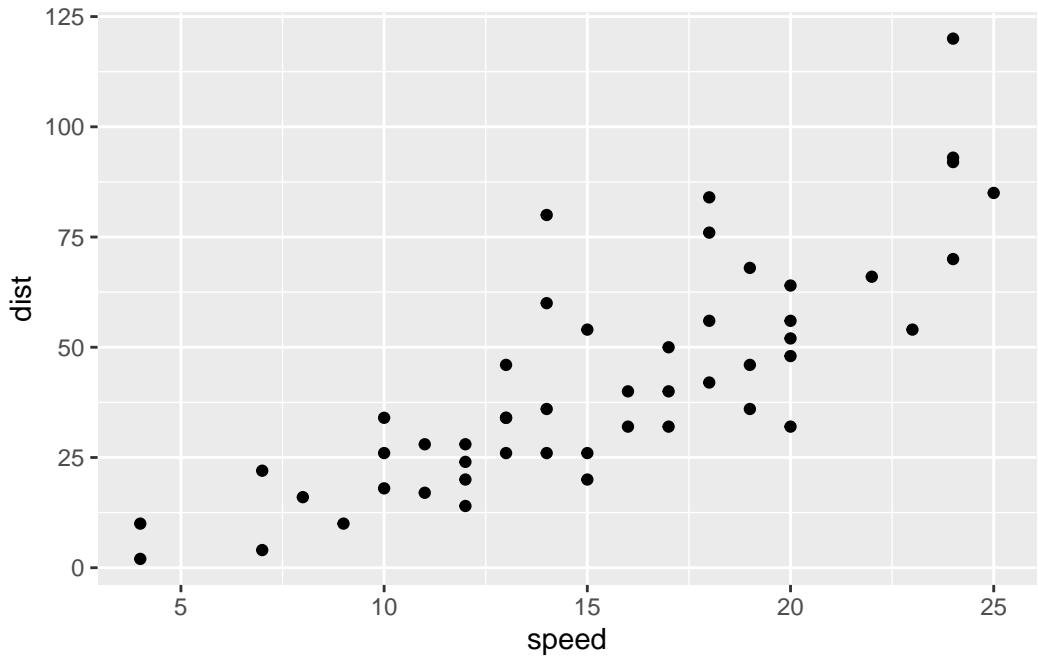


```
ggplot(cars)
```



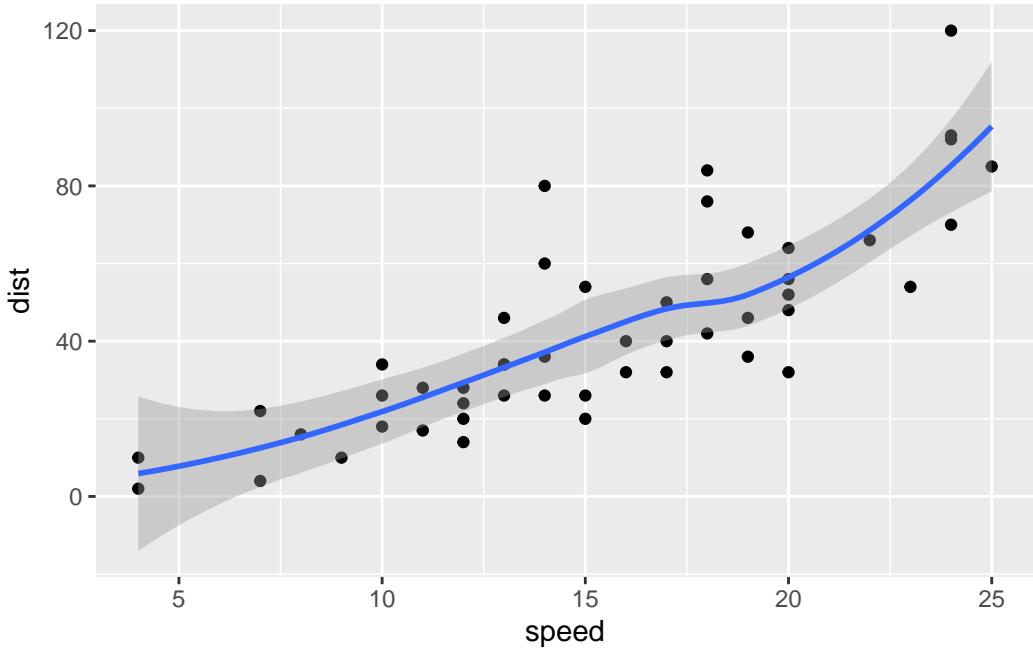
Plot dataset with ggplot2:

```
ggplot(cars) +  
  aes(x=speed, y=dist) +  
  geom_point()
```



Plot data points onto ggplot2 with aes() and geom\_point():

```
ggplot(cars) +  
  aes(x=speed, y=dist) +  
  geom_point() +  
  geom_smooth() # Add line  
  
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



```

p <- ggplot(cars) +
  aes(x=speed, y=dist) +
  geom_point() +
  geom_smooth(method = "lm", se=FALSE)

p <- ggplot(cars) +
  aes(x=speed, y=dist) +
  geom_point() +
  geom_smooth(method = "lm", se=FALSE) +
  labs(title="Speed and Stopping Distances of Cars",
       x="Speed (MPH)",
       y="Stopping Distance (ft)")

```

---

Read the drug expression data:

```

url <- "https://bioboot.github.io/bimm143_S20/class-material/up_down_expression.txt"
genes <- read.delim(url)
head(genes)

```

```

      Gene Condition1 Condition2      State
1     A4GNT -3.6808610 -3.4401355 unchanging
2     AAAS  4.5479580  4.3864126 unchanging
3    AASDH  3.7190695  3.4787276 unchanging
4     AATF  5.0784720  5.0151916 unchanging
5     AATK  0.4711421  0.5598642 unchanging
6 AB015752.4 -3.6808610 -3.5921390 unchanging

```

Analyzing the dataset:

```

nrow(genes) # Number of rows in the data set

[1] 5196

colnames(genes) # Name of columns in the data set

[1] "Gene"       "Condition1" "Condition2" "State"

table(genes$State) # Different states of genes in the data set

down unchanging      up
72        4997      127

table(genes$State) / nrow(genes) * 100

down unchanging      up
1.385681  96.170131  2.444188

```

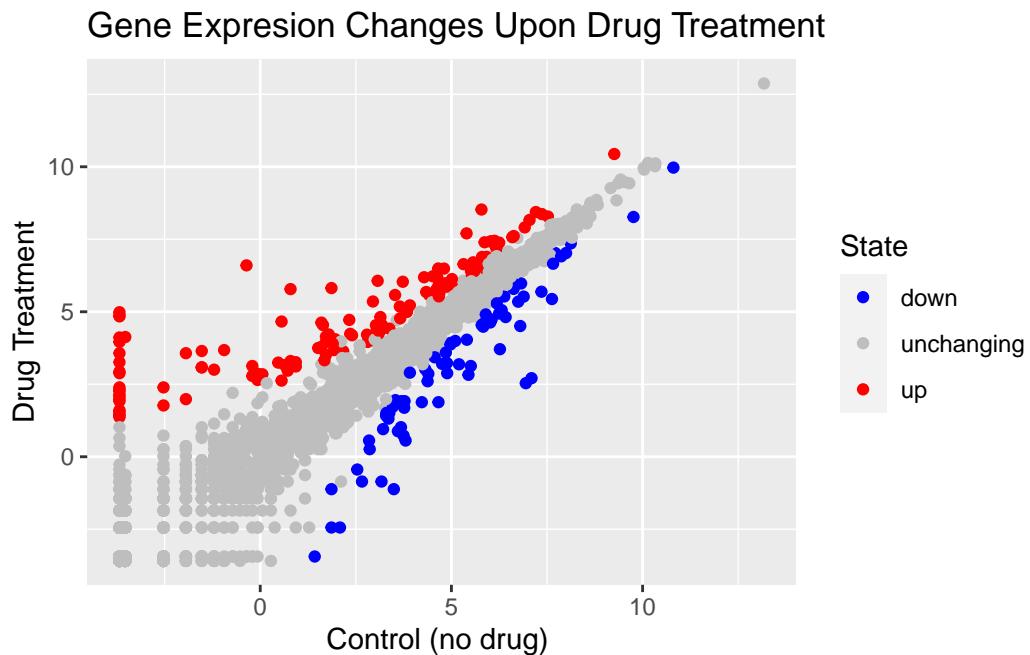
Plot a scatter plot of the two conditions in the genes data

```

ggplot(genes) +
  aes(x=Condition1, y=Condition2, col=State) +
  geom_point() +
  scale_colour_manual(values = c("blue","grey","red")) +
  labs(title="Gene Expression Changes Upon Drug Treatment",

```

```
x="Control (no drug) ",  
y="Drug Treatment")
```



---

Advanced ggplot() function through gapminder dataset

```
# Import gapminder  
url <- "https://raw.githubusercontent.com/jennybc/gapminder/master/inst/extdata/gapminder.csv"  
gapminder <- read.delim(url)
```

Use dplyr to focus on single year:

```
# install.packages("dplyr")  
library(dplyr)
```

Attaching package: 'dplyr'

The following objects are masked from 'package:stats':

```
filter, lag
```

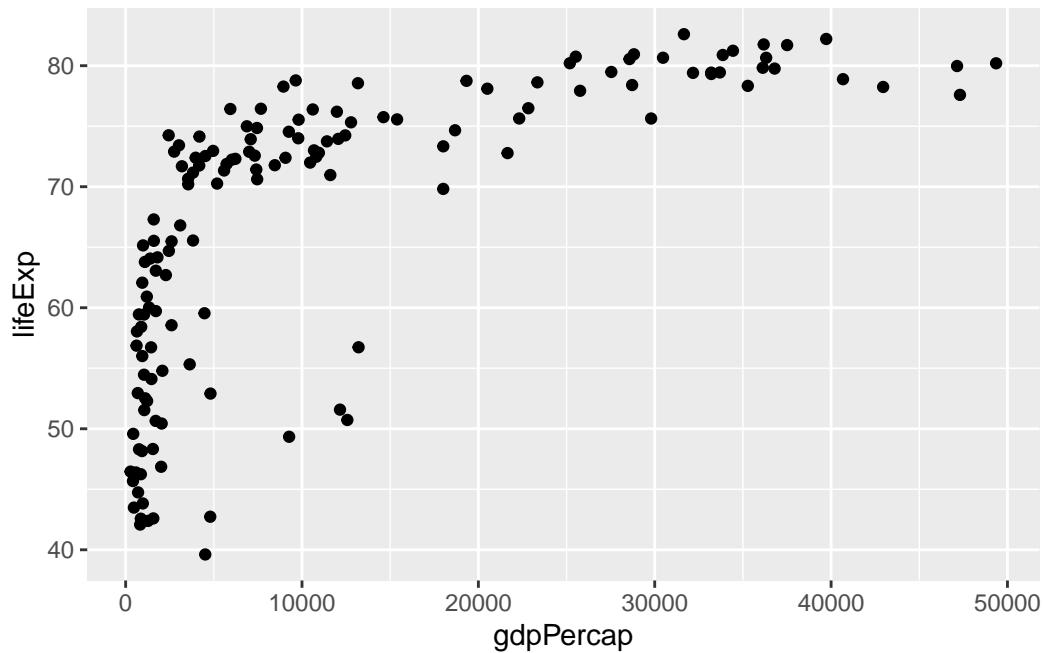
The following objects are masked from 'package:base':

```
intersect, setdiff, setequal, union
```

```
gapminder_2007 <- gapminder %>% filter(year==2007)
```

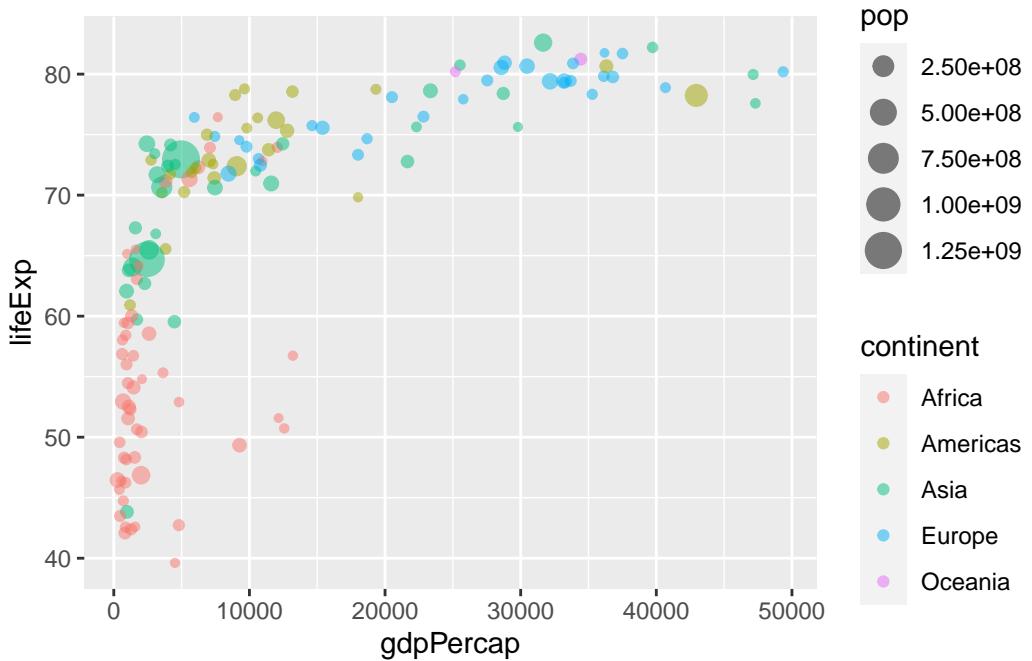
Plot the result:

```
ggplot(gapminder_2007) +  
  aes(x=gdpPercap, y=lifeExp) +  
  geom_point()
```



Adding more aesthetics:

```
ggplot(gapminder_2007) +  
  aes(x=gdpPercap, y=lifeExp, color=continent, size=pop) +  
  geom_point(alpha=0.5)
```



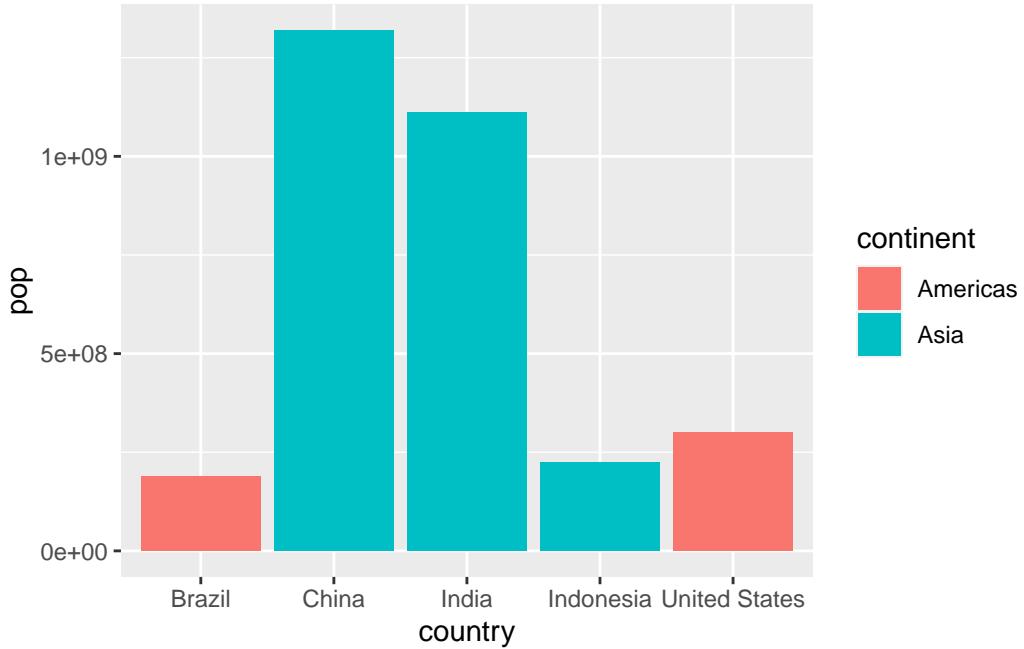
Analyzing data through bar chart:

```
gapminder_top5 <- gapminder %>%
  filter(year==2007) %>%
  arrange(desc(pop)) %>%
  top_n(5, pop)
```

```
gapminder_top5
```

	country	continent	year	lifeExp	pop	gdpPerCap
1	China	Asia	2007	72.961	1318683096	4959.115
2	India	Asia	2007	64.698	1110396331	2452.210
3	United States	Americas	2007	78.242	301139947	42951.653
4	Indonesia	Asia	2007	70.650	223547000	3540.652
5	Brazil	Americas	2007	72.390	190010647	9065.801

```
ggplot(gapminder_top5) +
  geom_col(aes(x = country, y = pop, fill = continent))
```

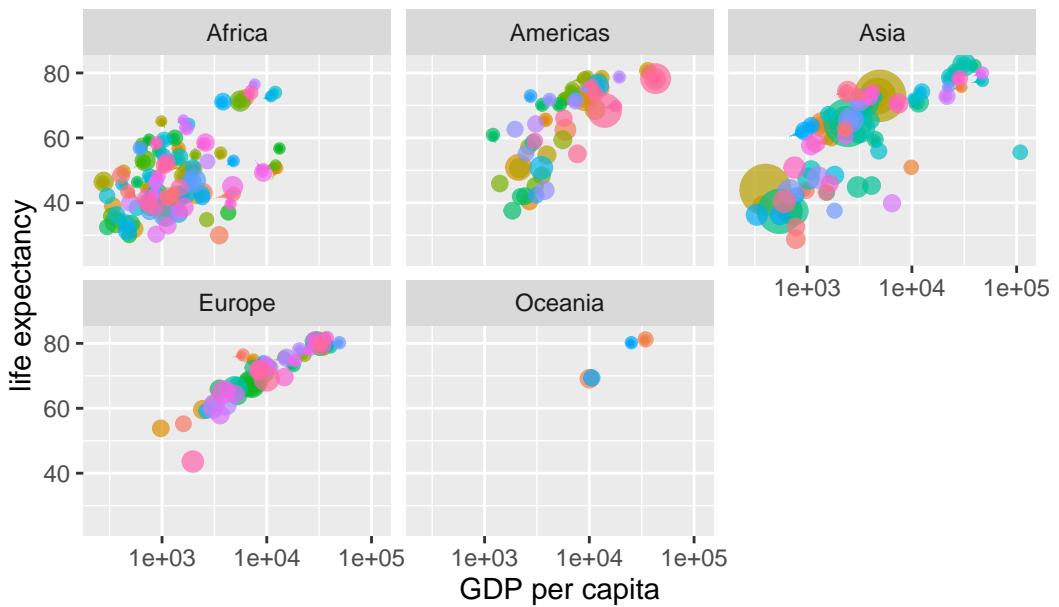


Animations of ggplot, through gifski() and ganimate():

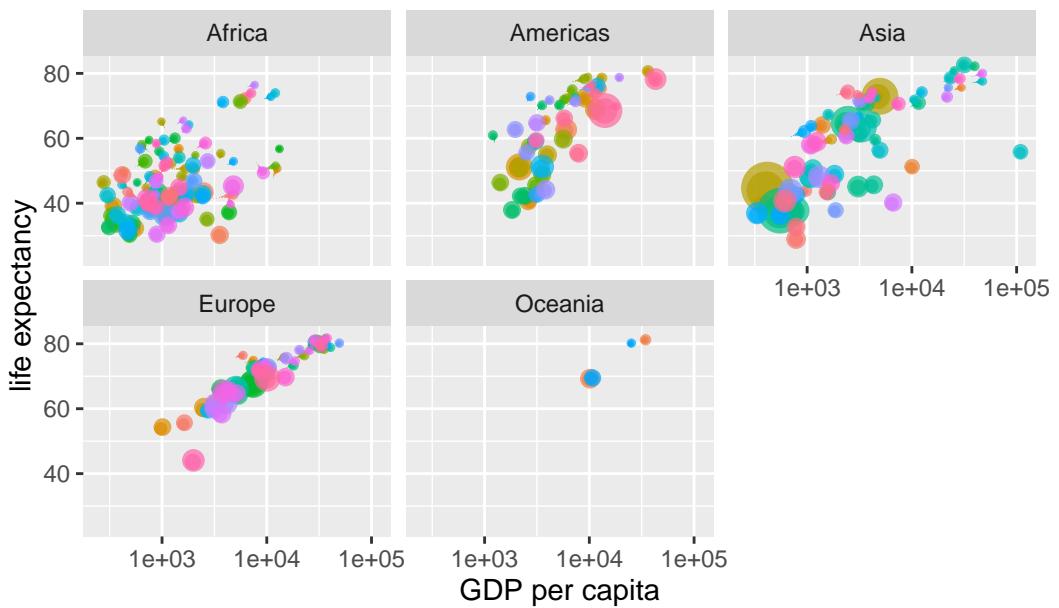
```
library(gifski)
library(gganimate)

ggplot(gapminder, aes(gdpPercap, lifeExp, size = pop, colour = country)) +
  geom_point(alpha = 0.7, show.legend = FALSE) +
# scale_colour_manual(values = country_colors) +
  scale_size(range = c(2, 12)) +
  scale_x_log10() +
  facet_wrap(~continent) +
  labs(title = 'Year: {frame_time}', x = 'GDP per capita', y = 'life expectancy') +
  transition_time(year) +
  shadow_wake(wake_length = 0.1, alpha = FALSE)
```

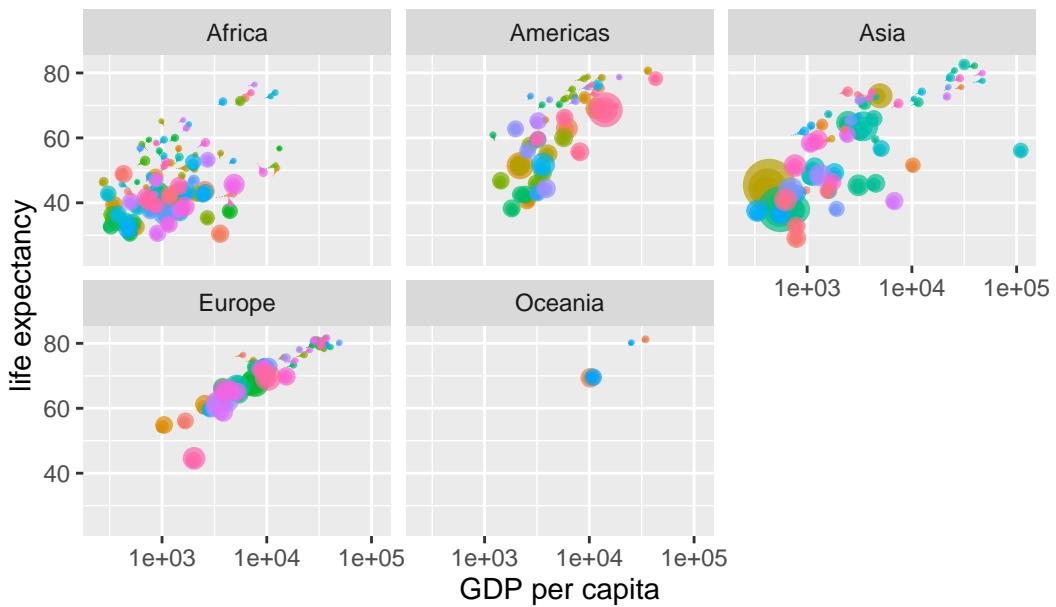
Year: 1952



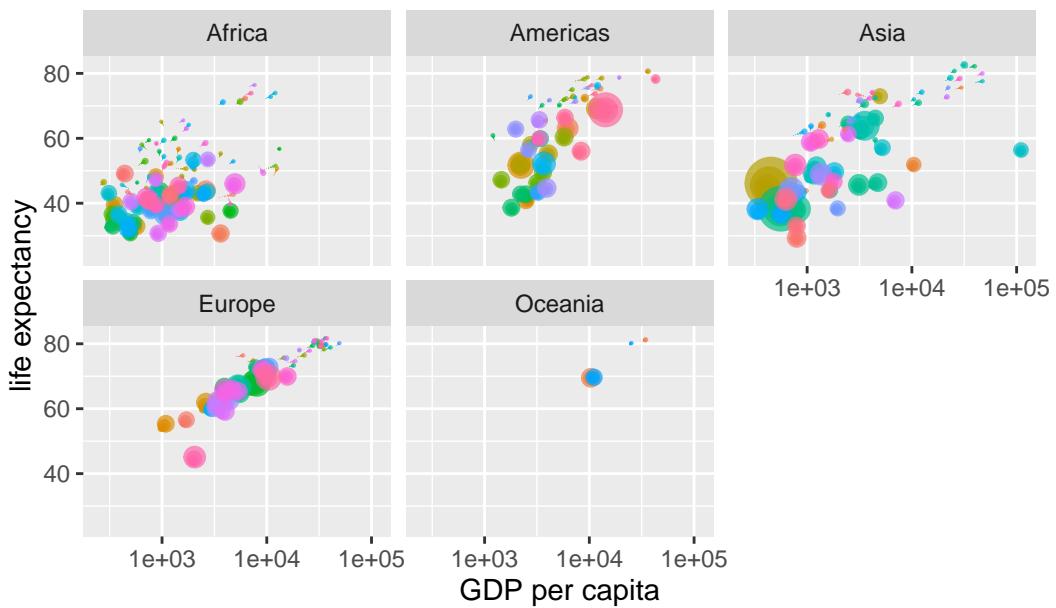
Year: 1953



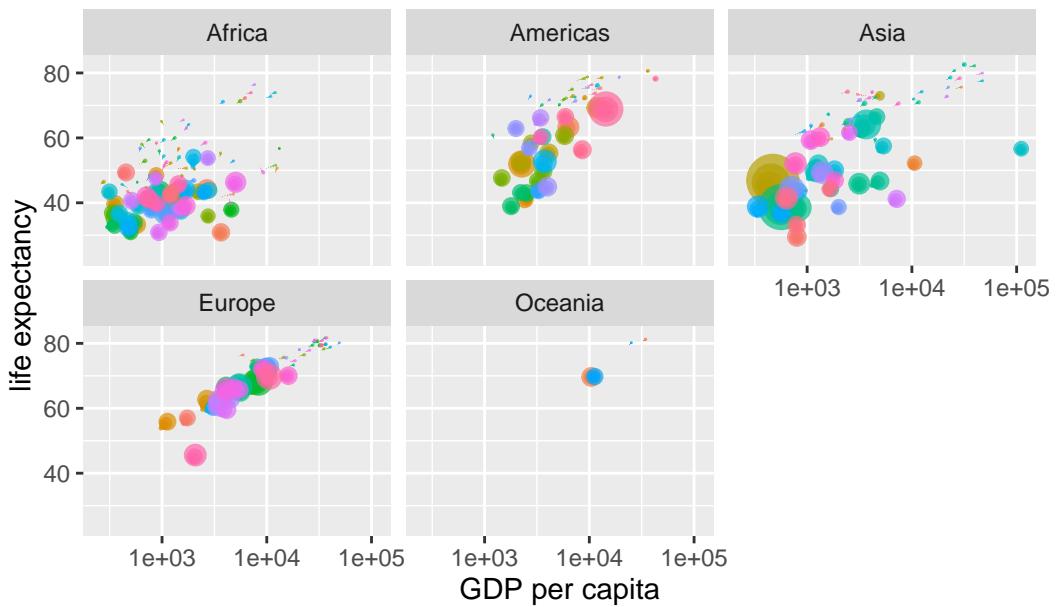
Year: 1953



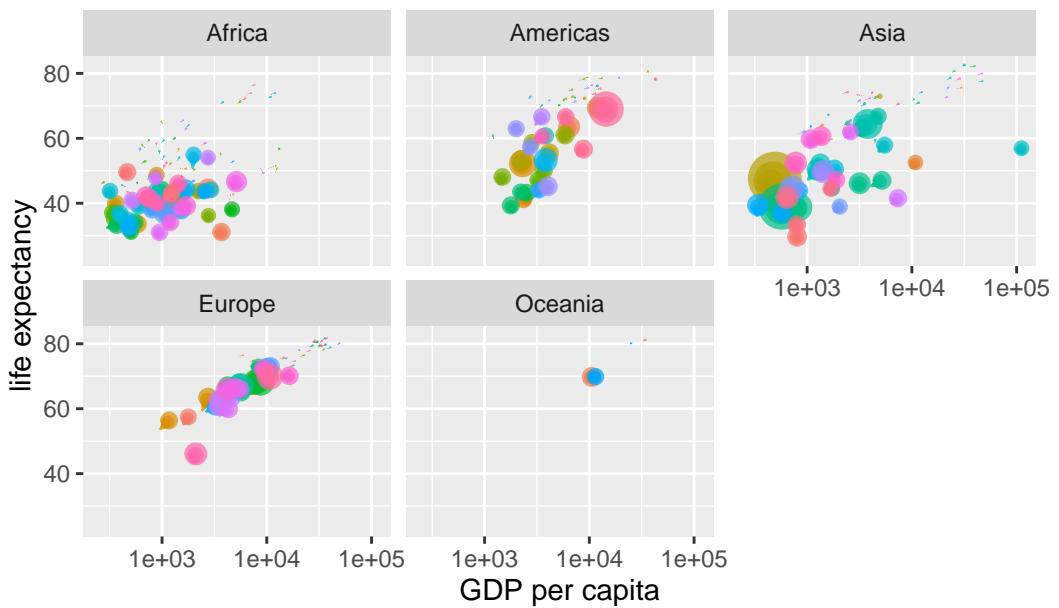
Year: 1954



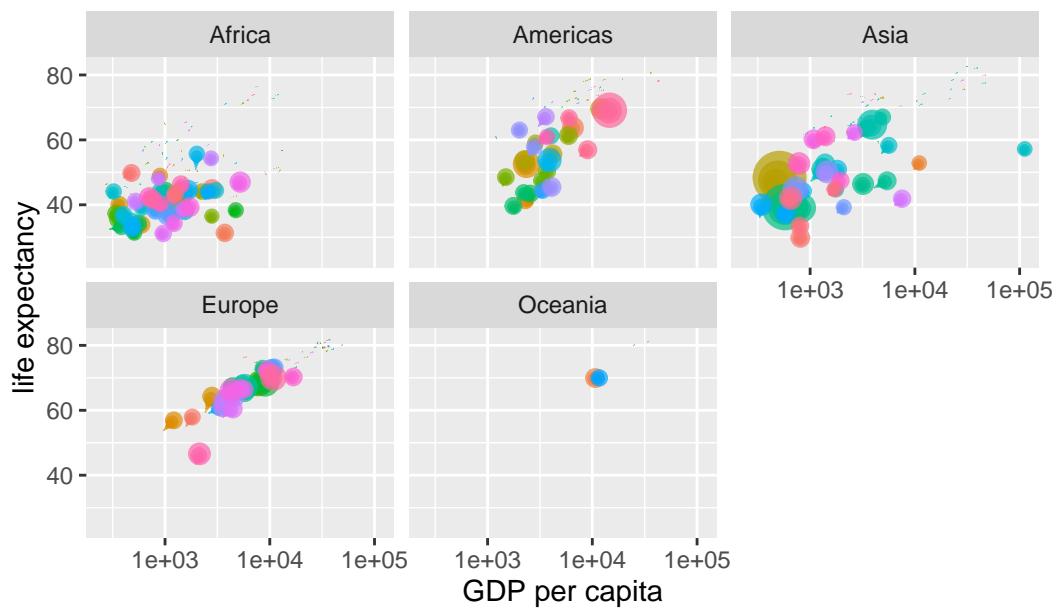
Year: 1954



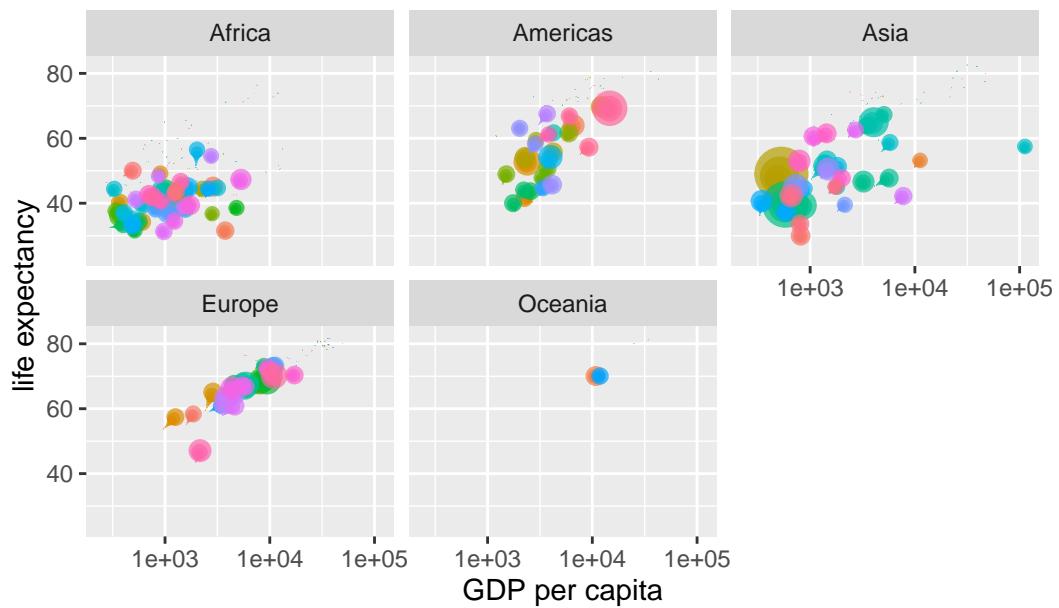
Year: 1955



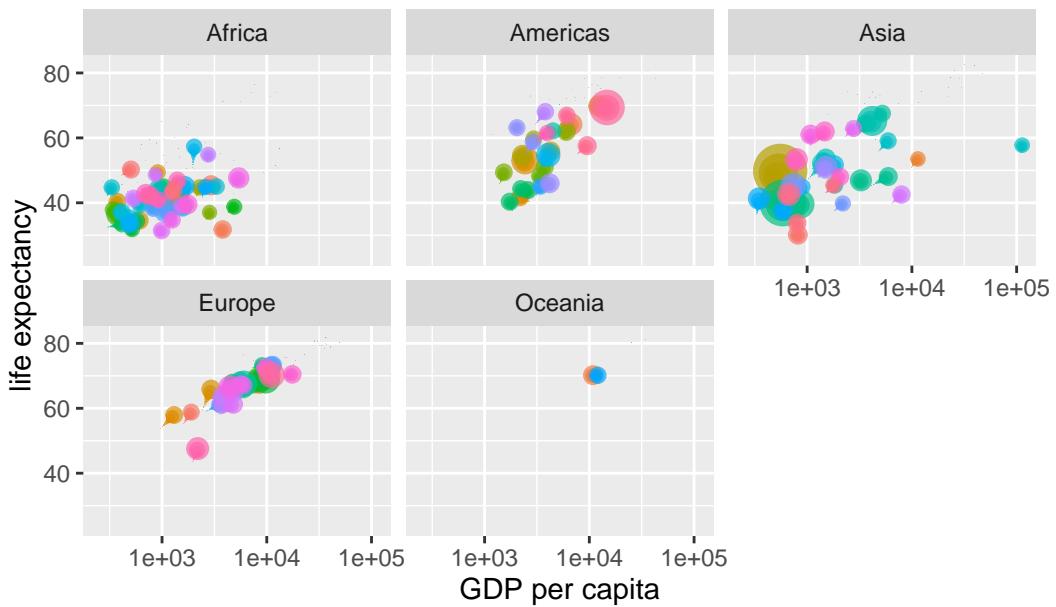
Year: 1955



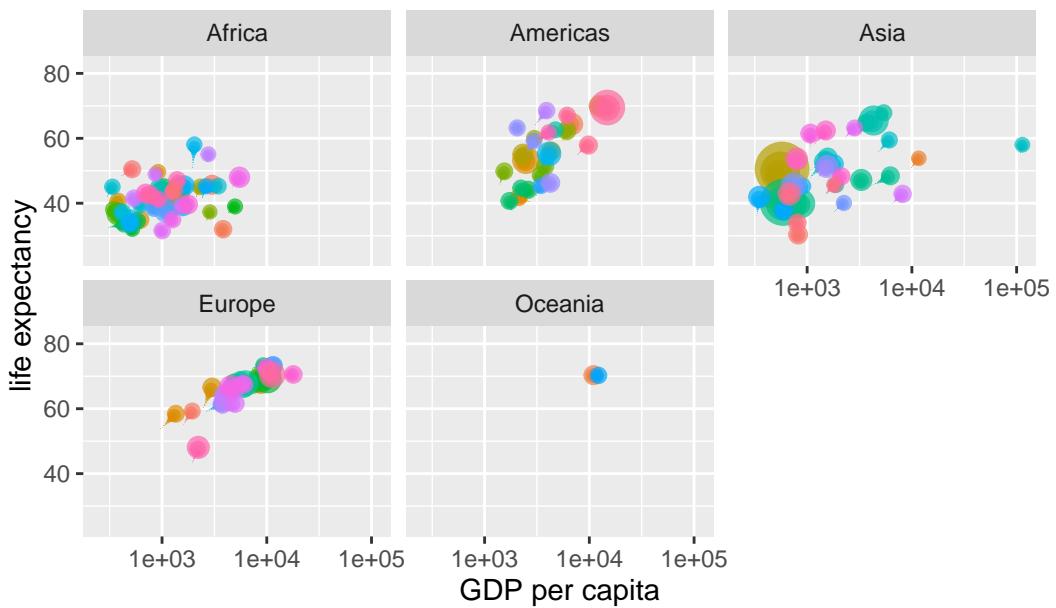
Year: 1956



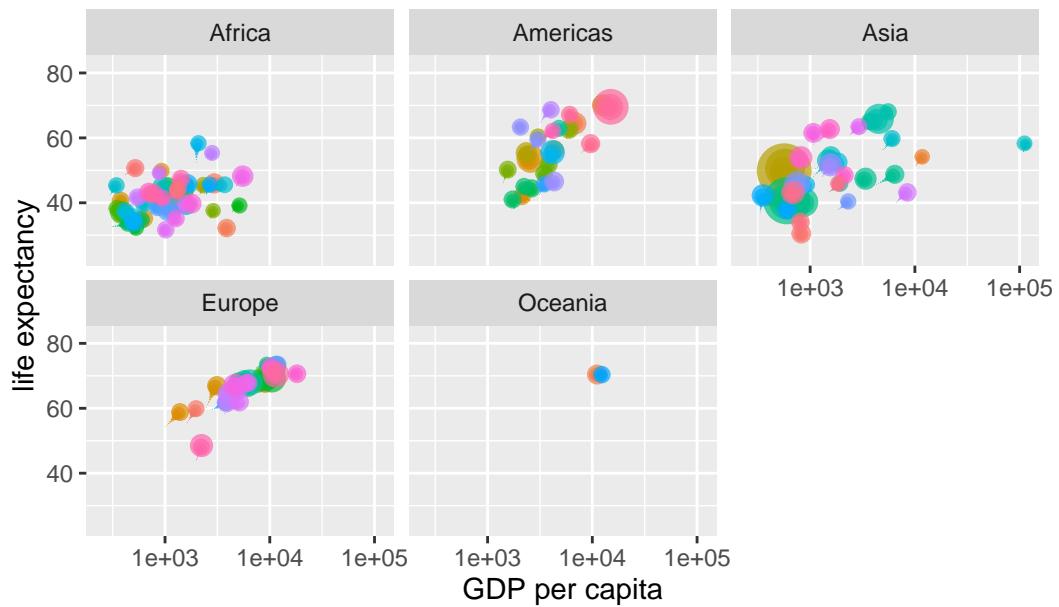
Year: 1956



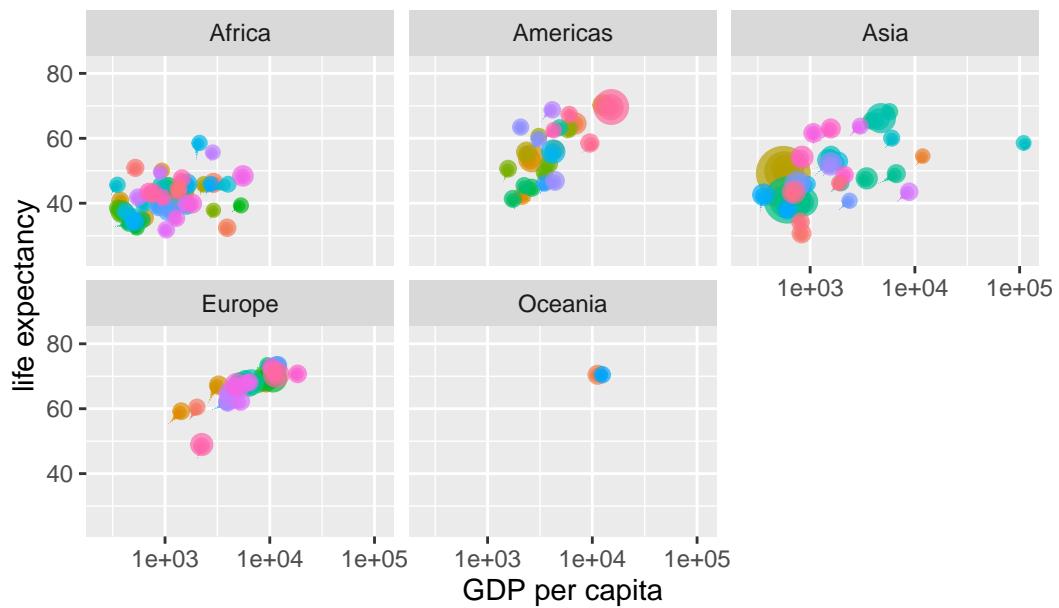
Year: 1957



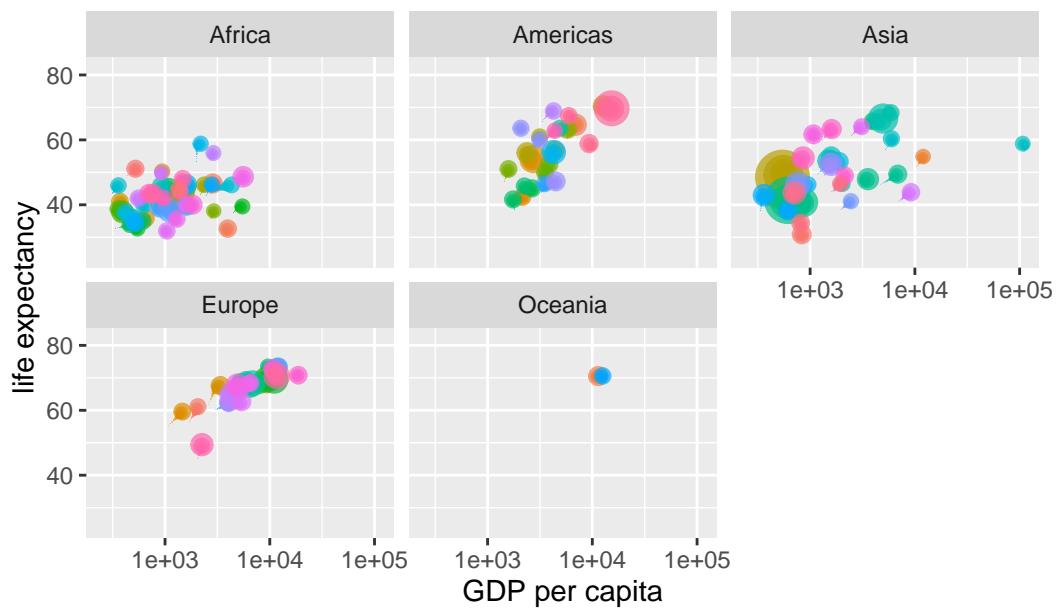
Year: 1958



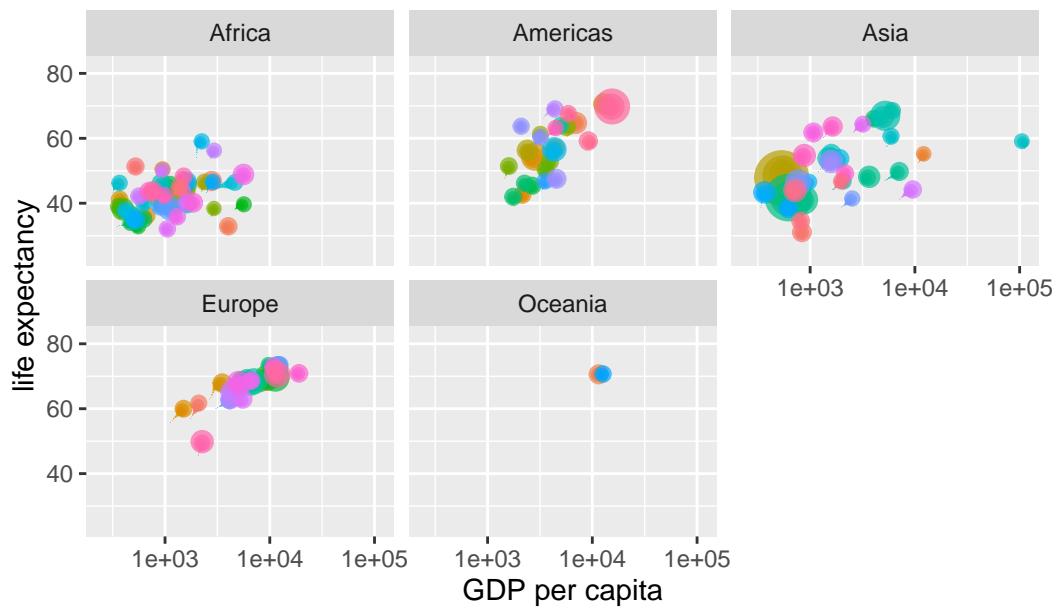
Year: 1958



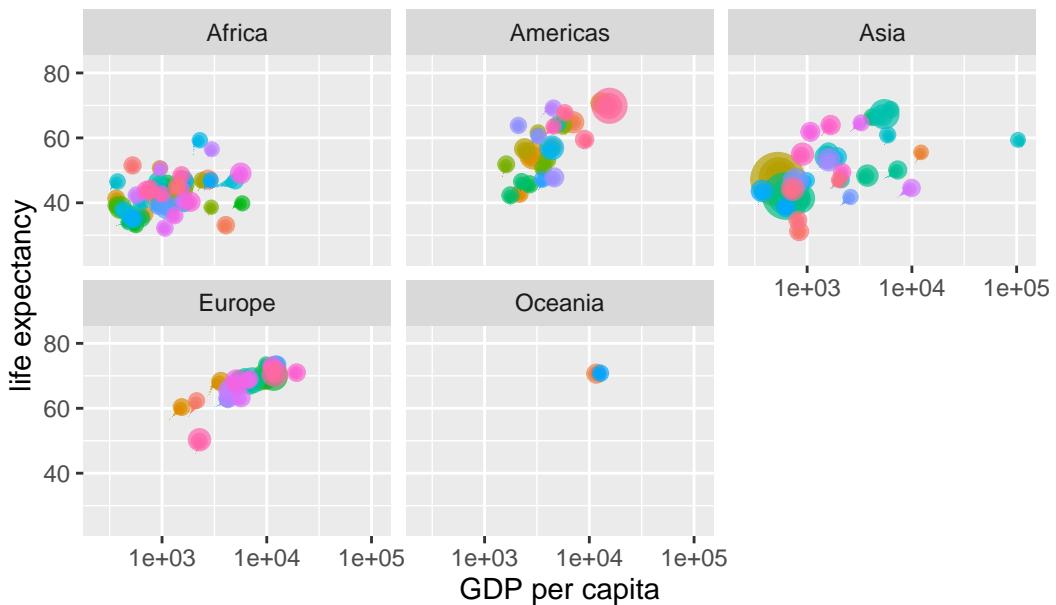
Year: 1959



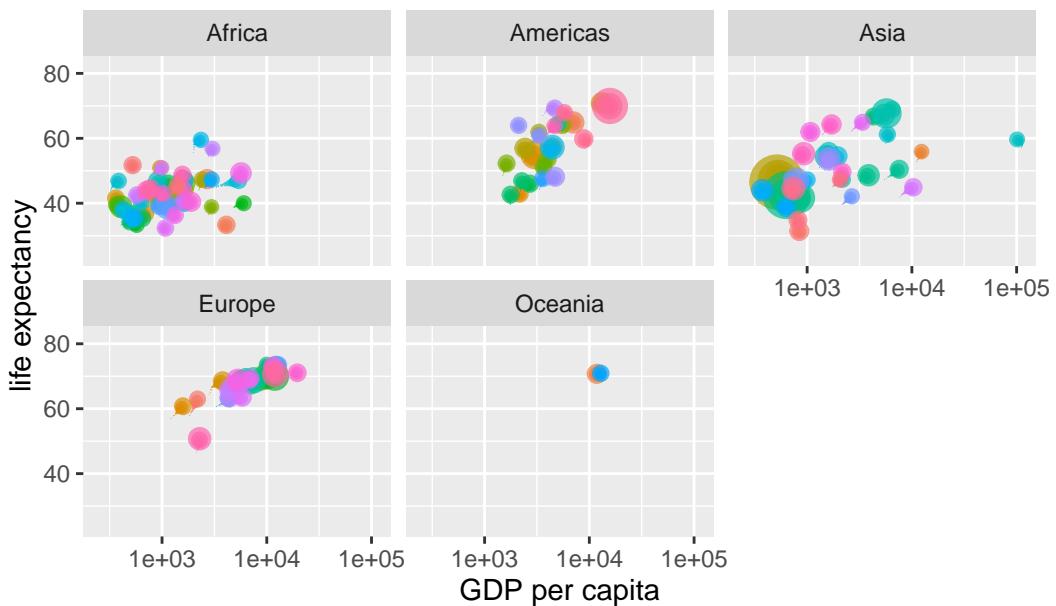
Year: 1959



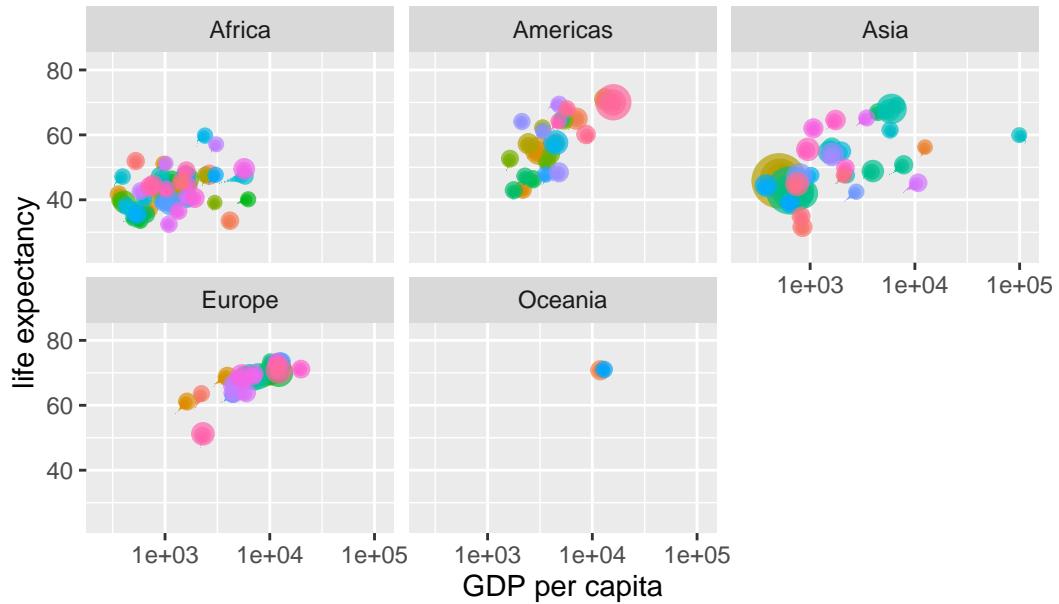
Year: 1960



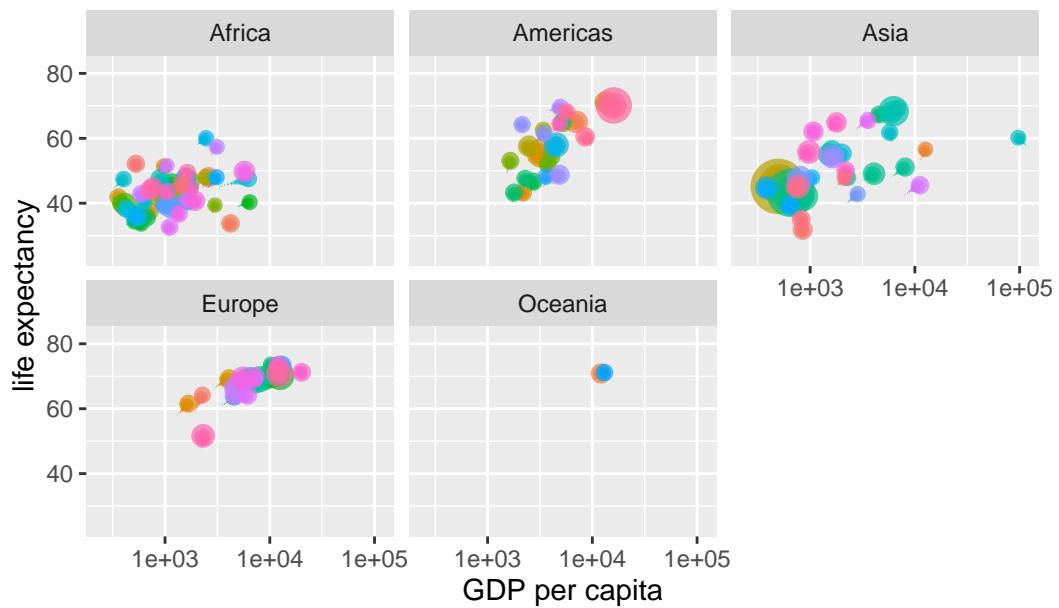
Year: 1960



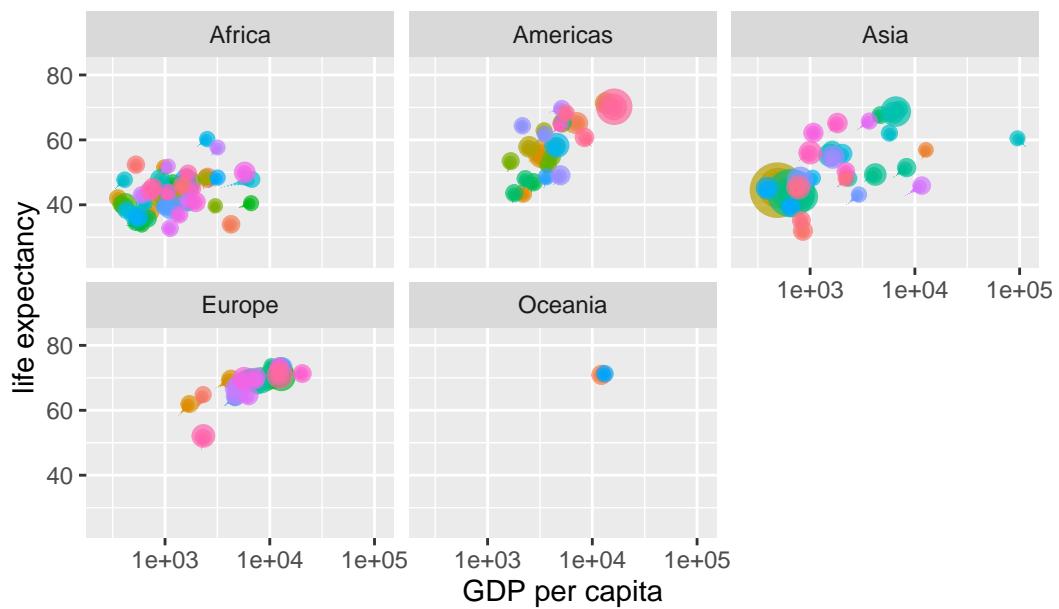
Year: 1961



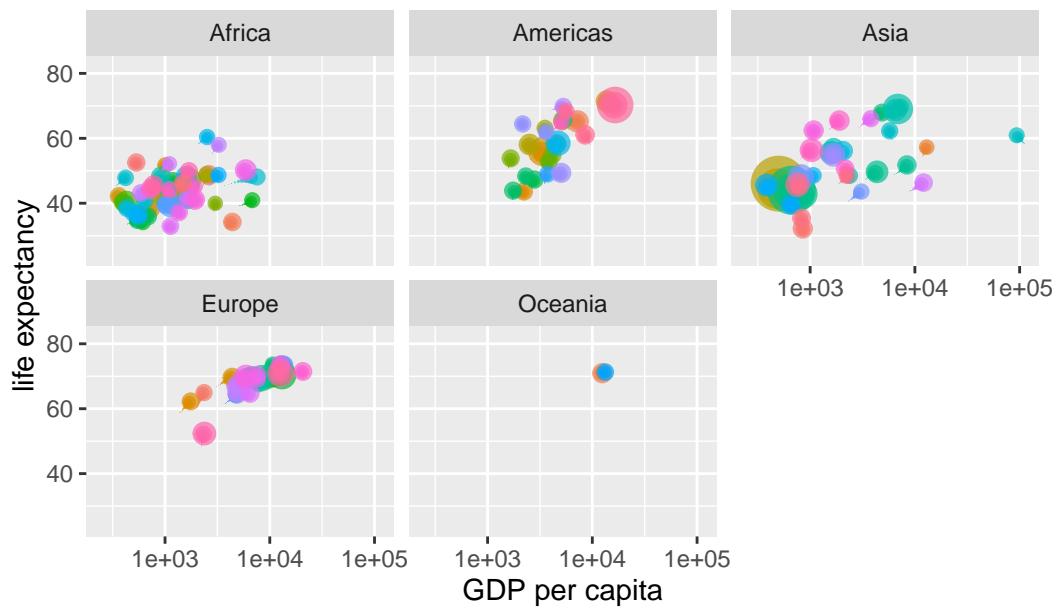
Year: 1961



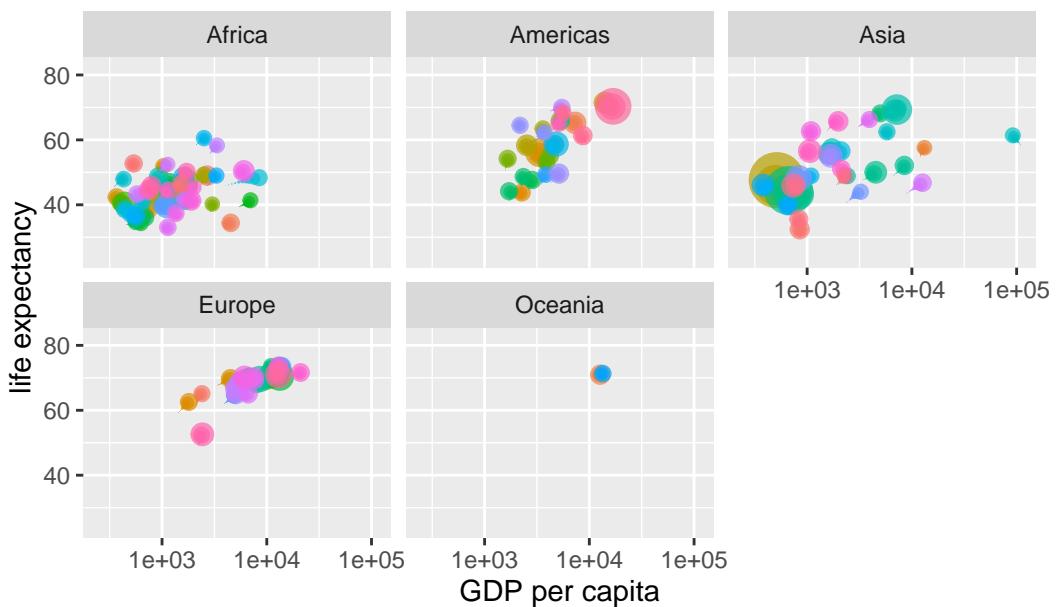
Year: 1962



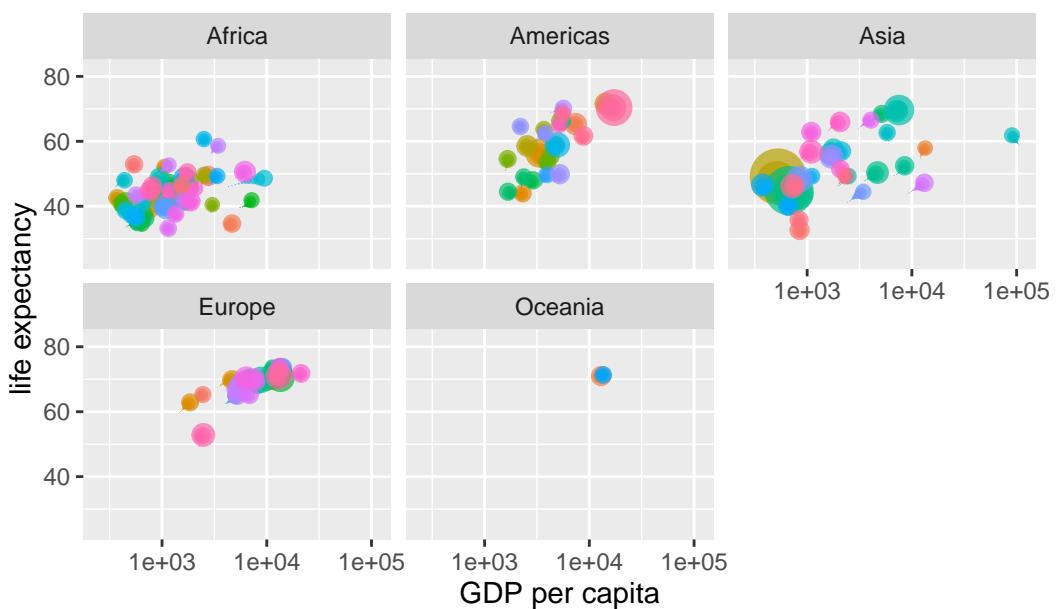
Year: 1963



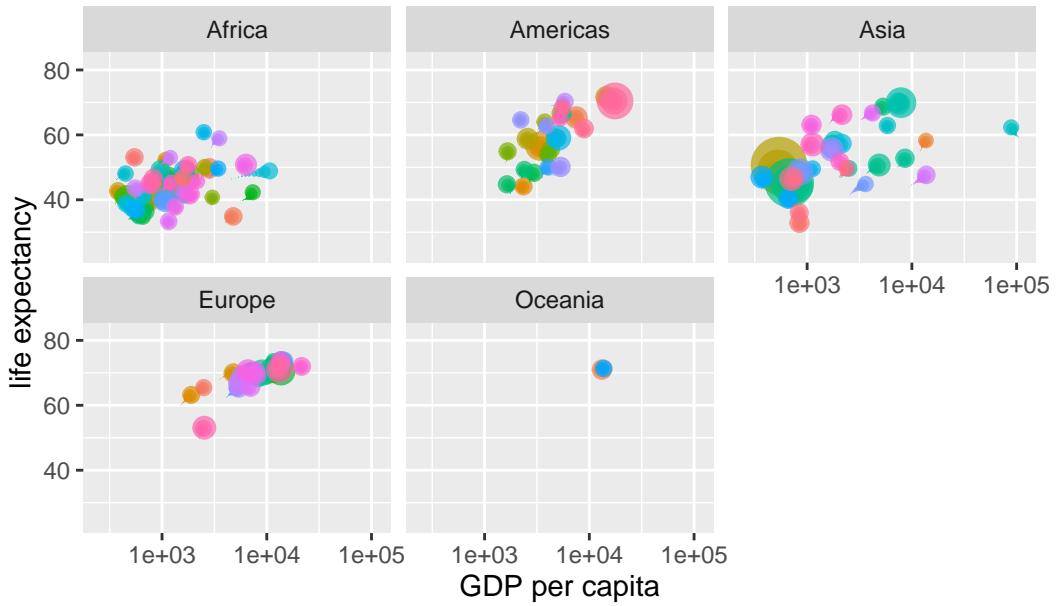
Year: 1963



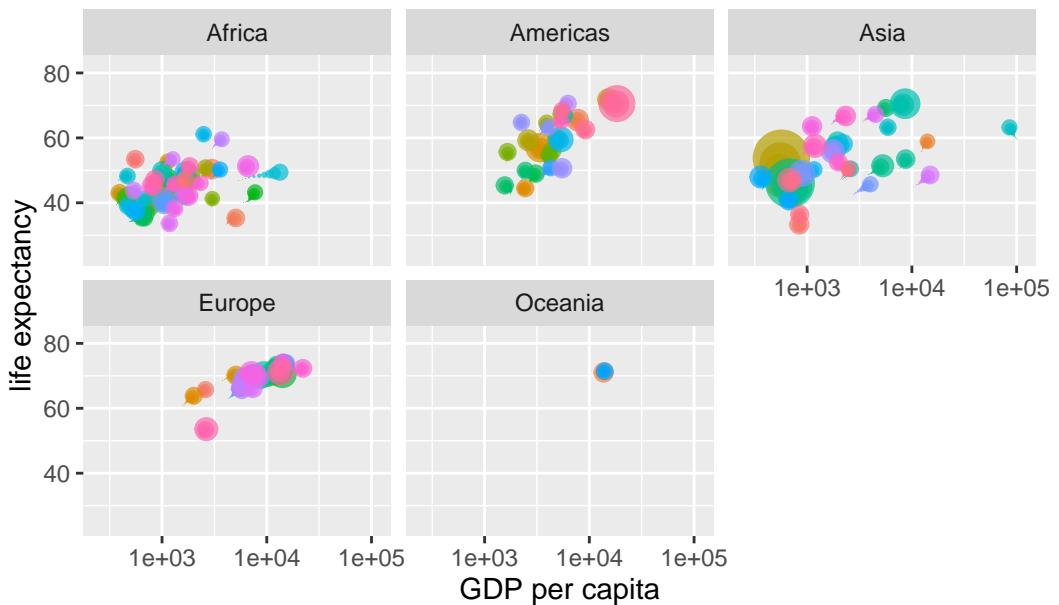
Year: 1964



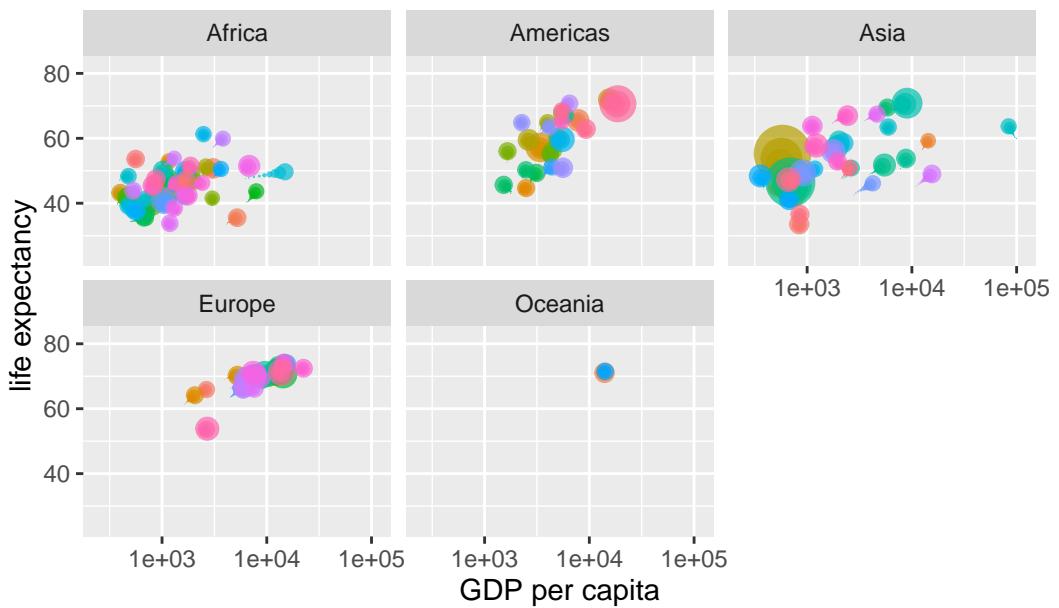
Year: 1964



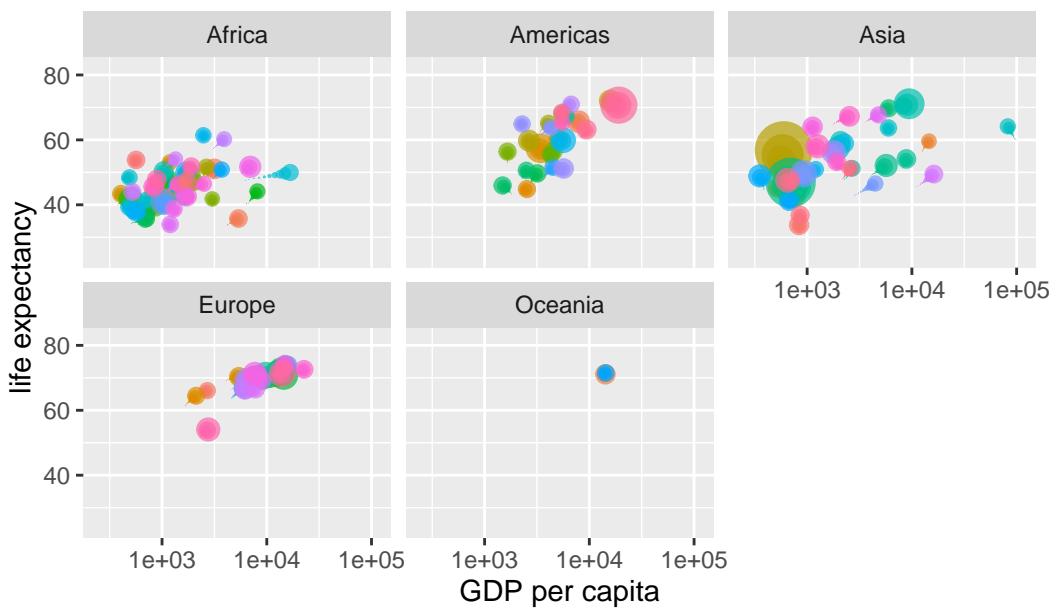
Year: 1965



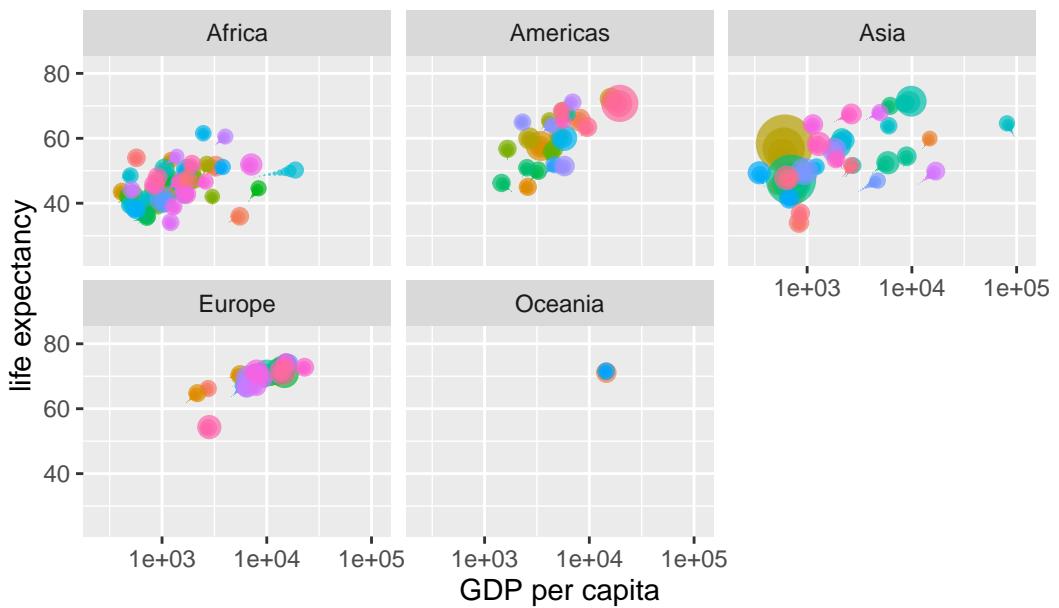
Year: 1966



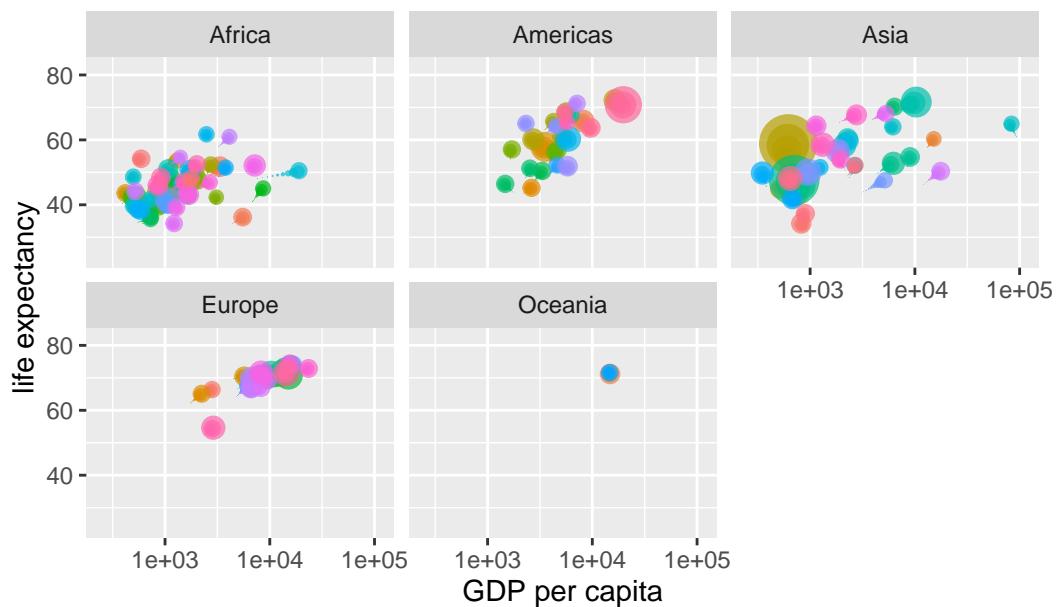
Year: 1966



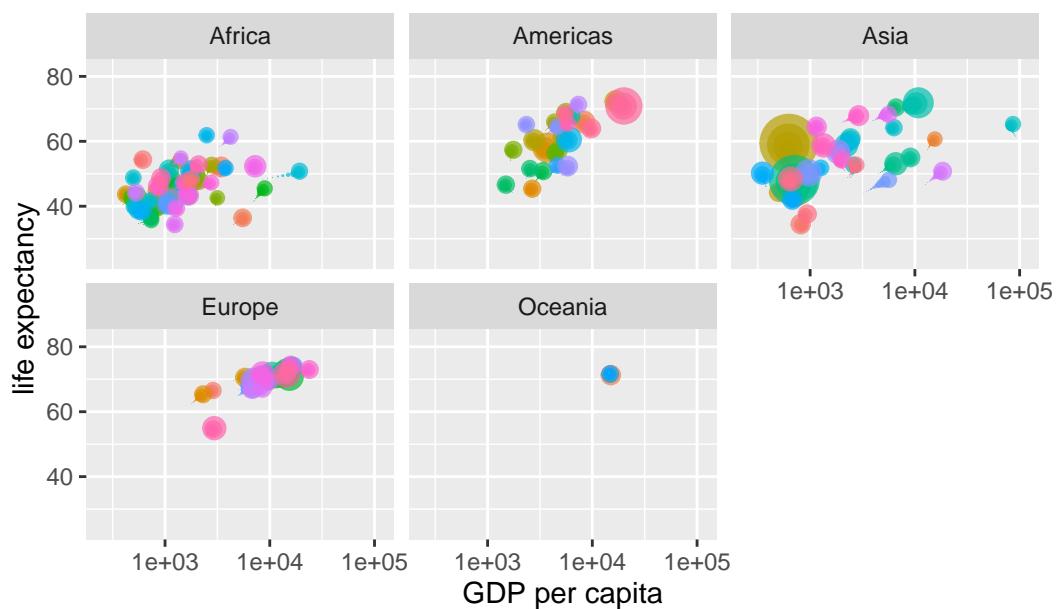
Year: 1967



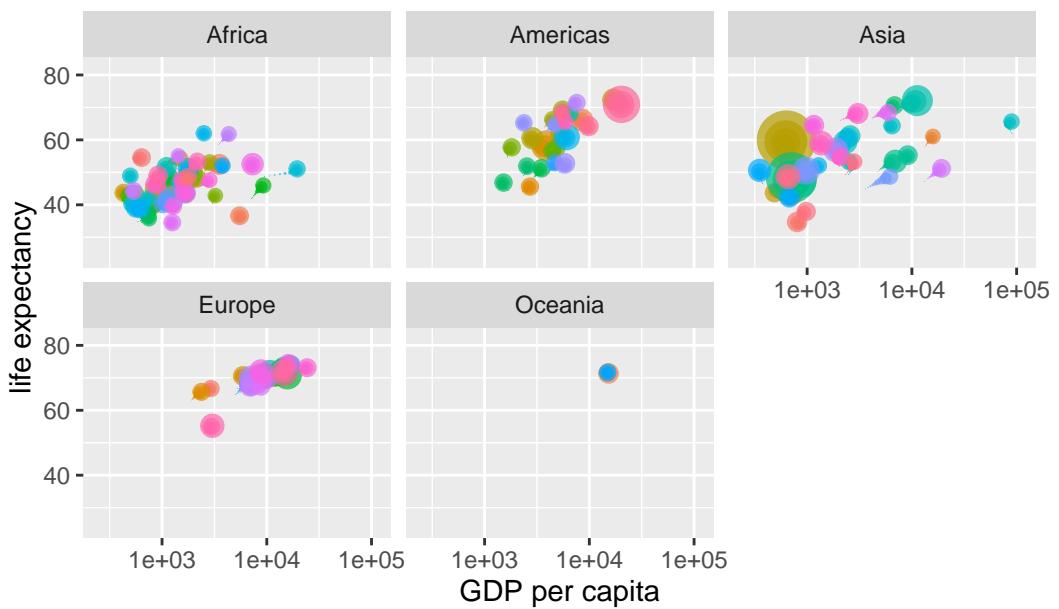
Year: 1968



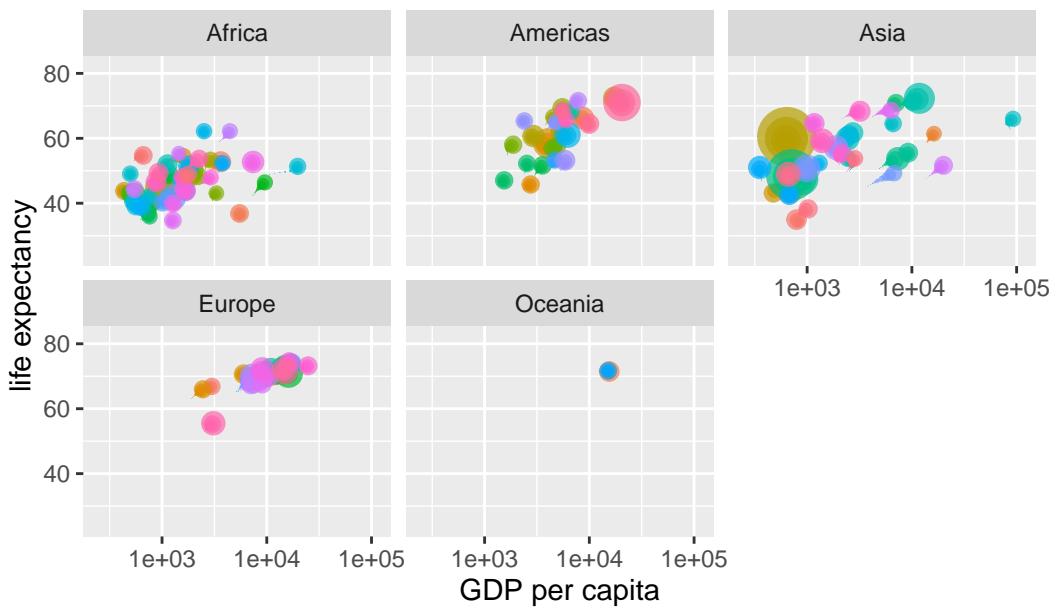
Year: 1968



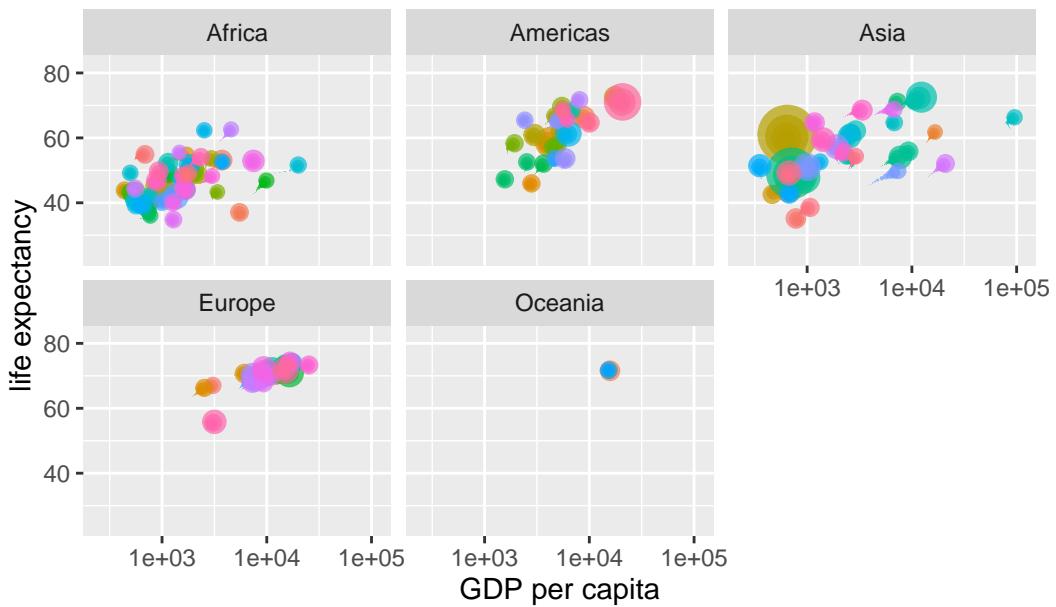
Year: 1969



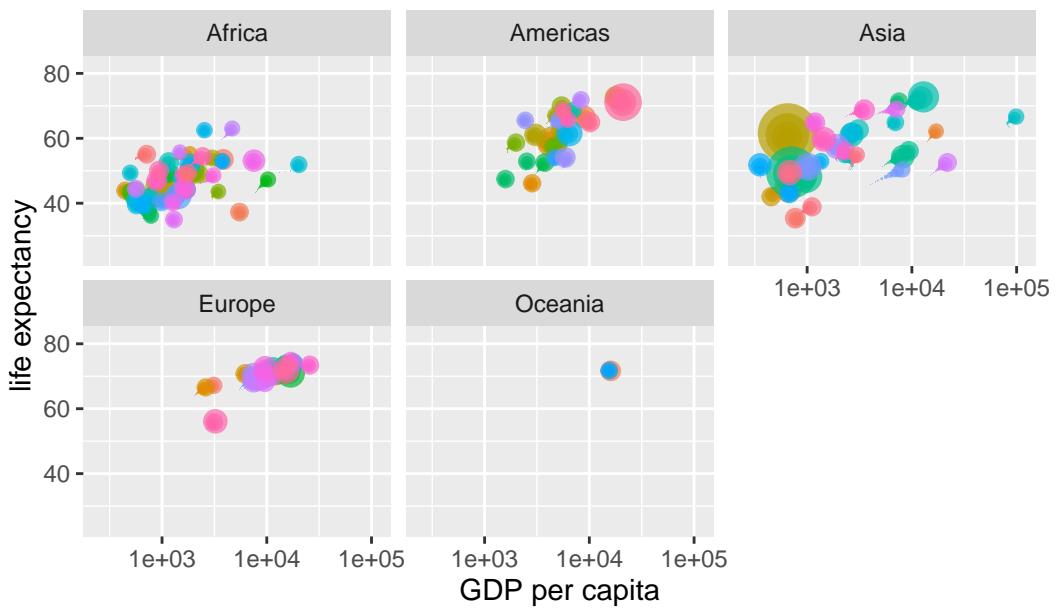
Year: 1969



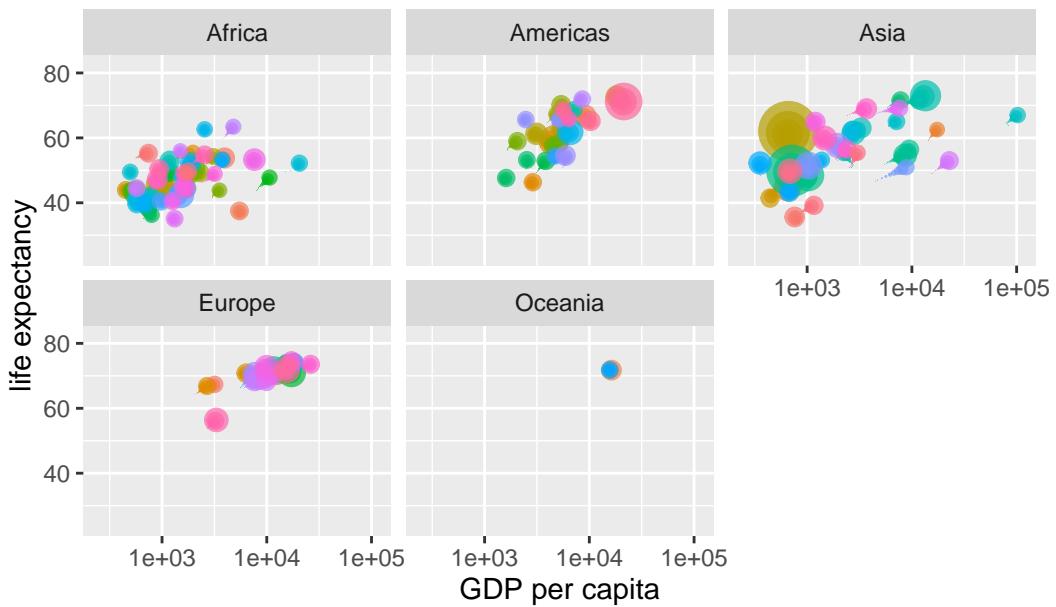
Year: 1970



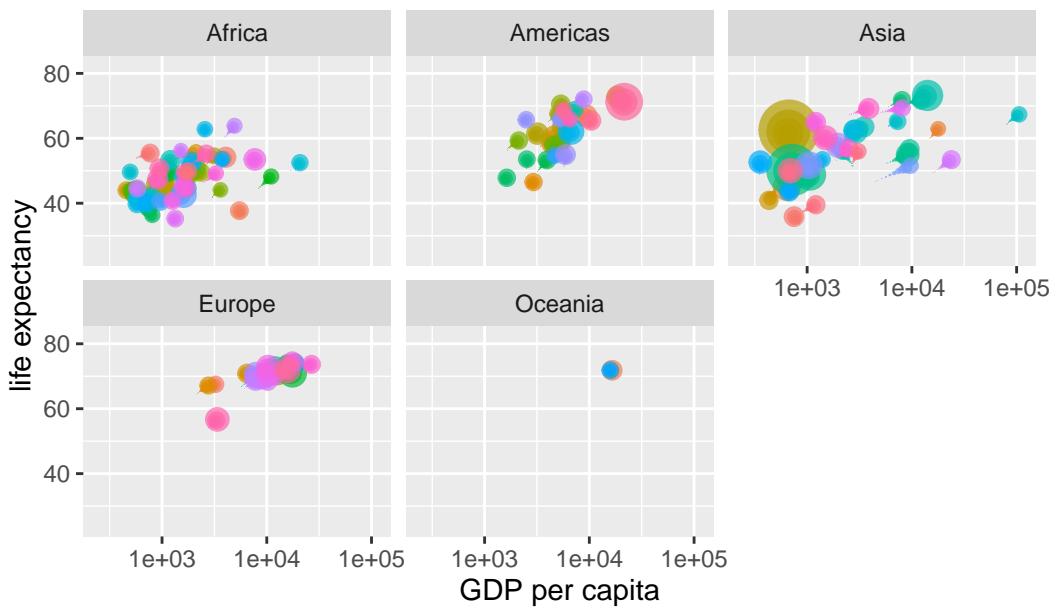
Year: 1970



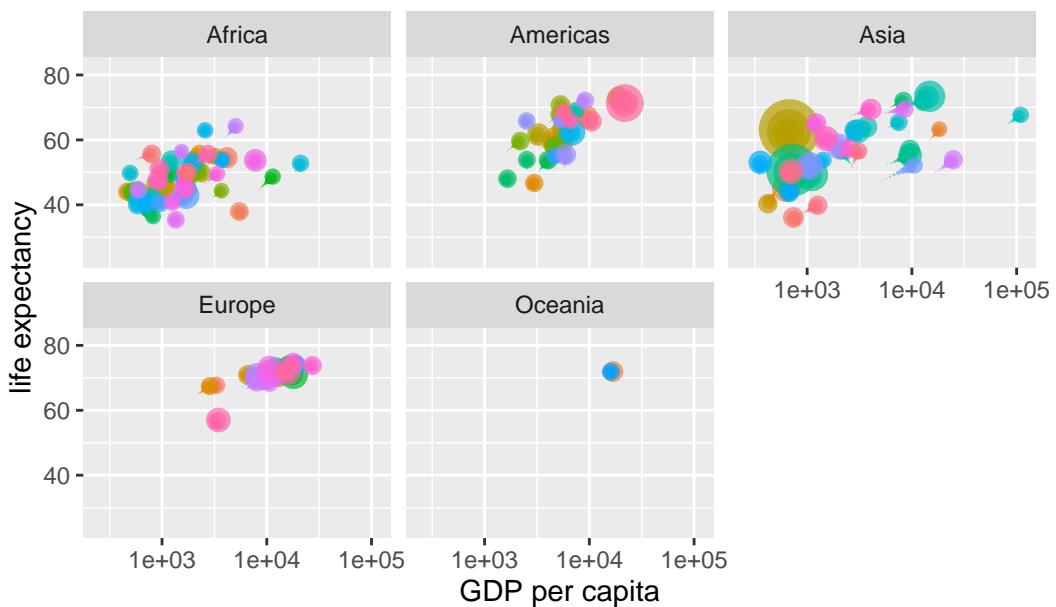
Year: 1971



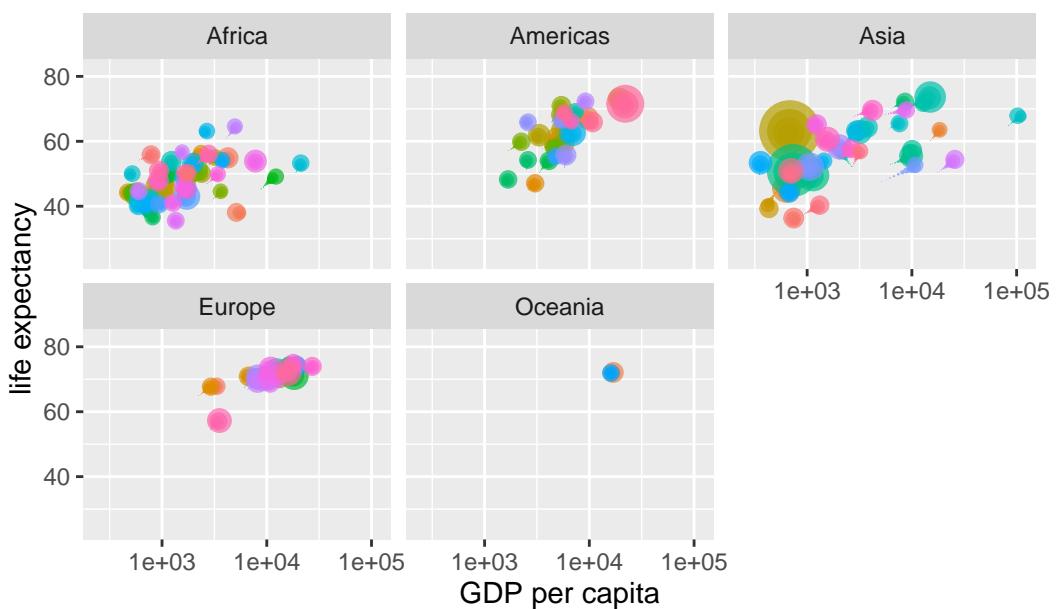
Year: 1971



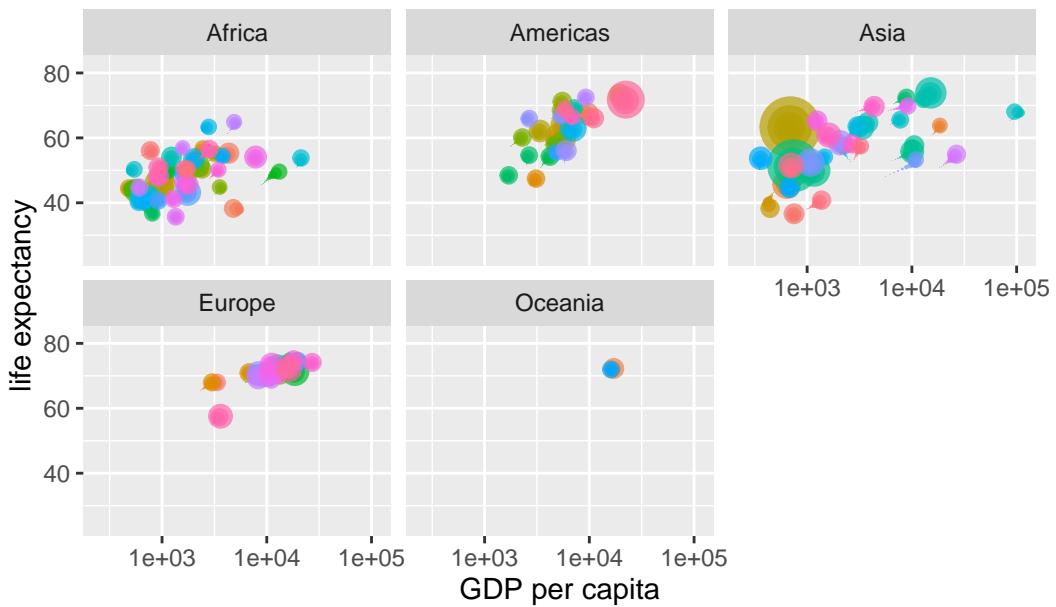
Year: 1972



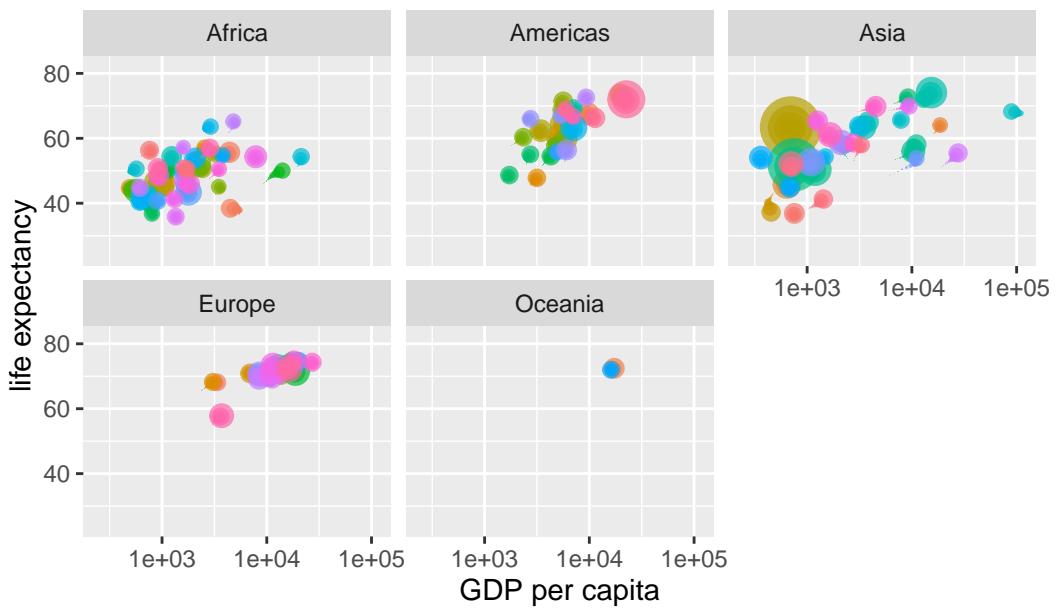
Year: 1973



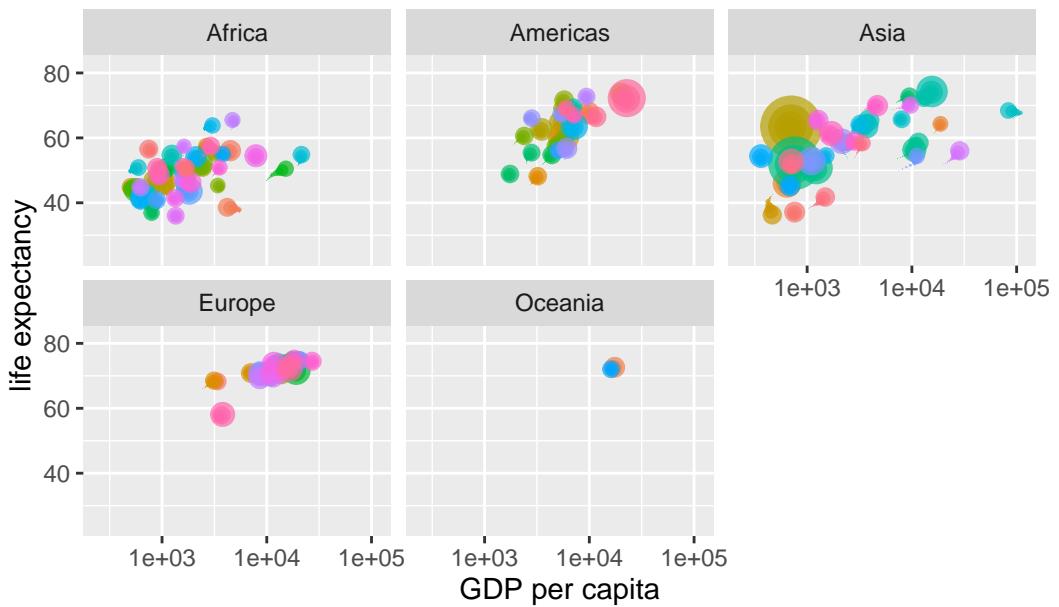
Year: 1973



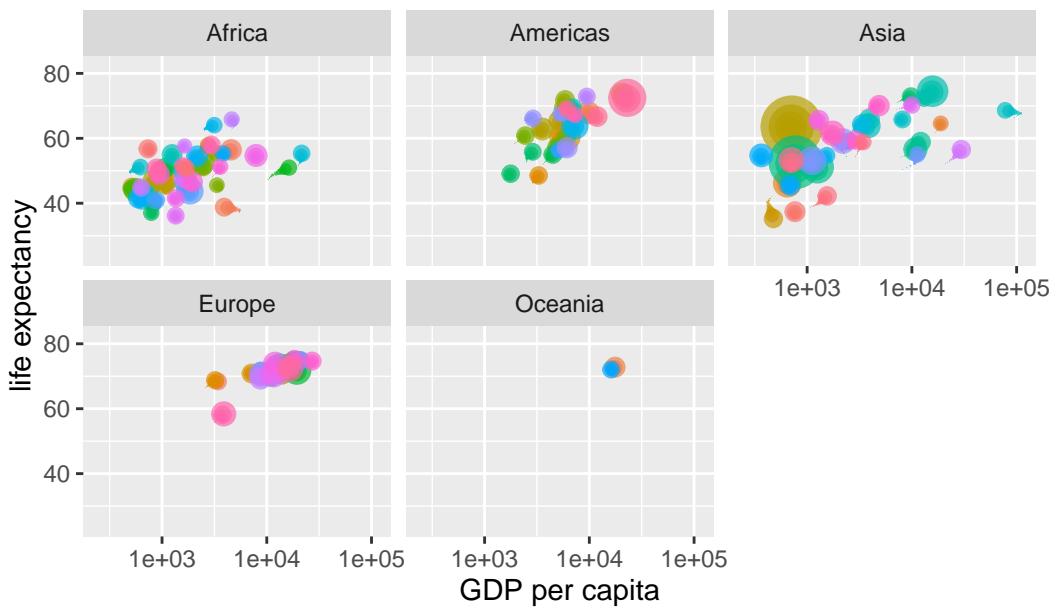
Year: 1974



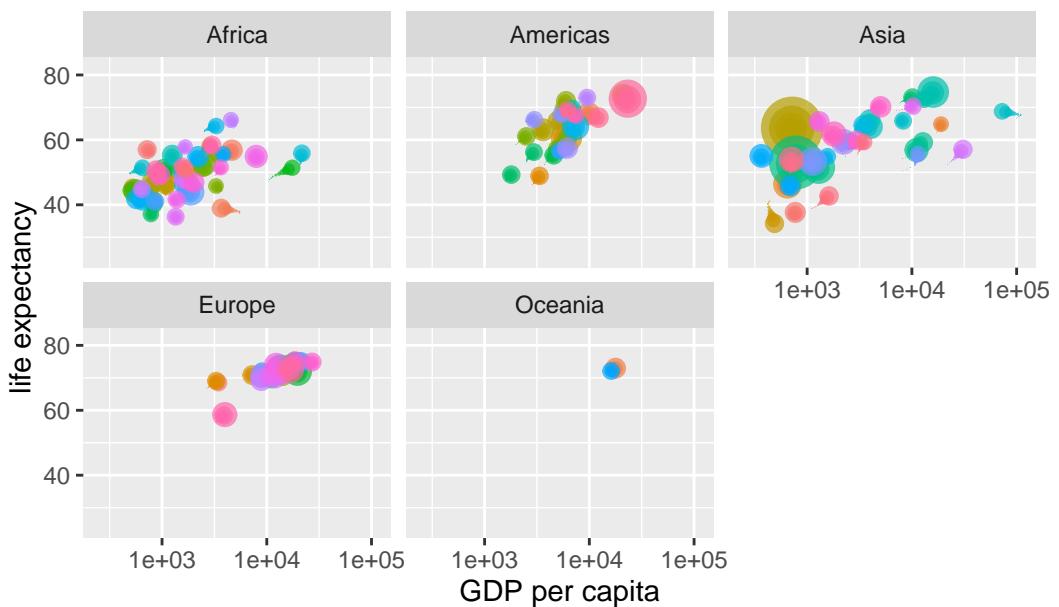
Year: 1974



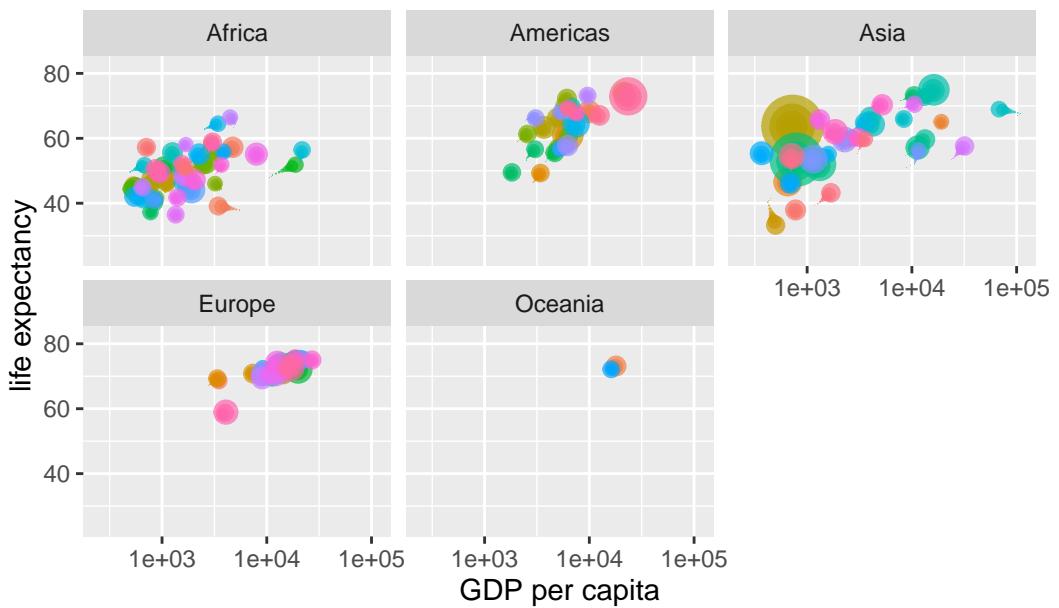
Year: 1975



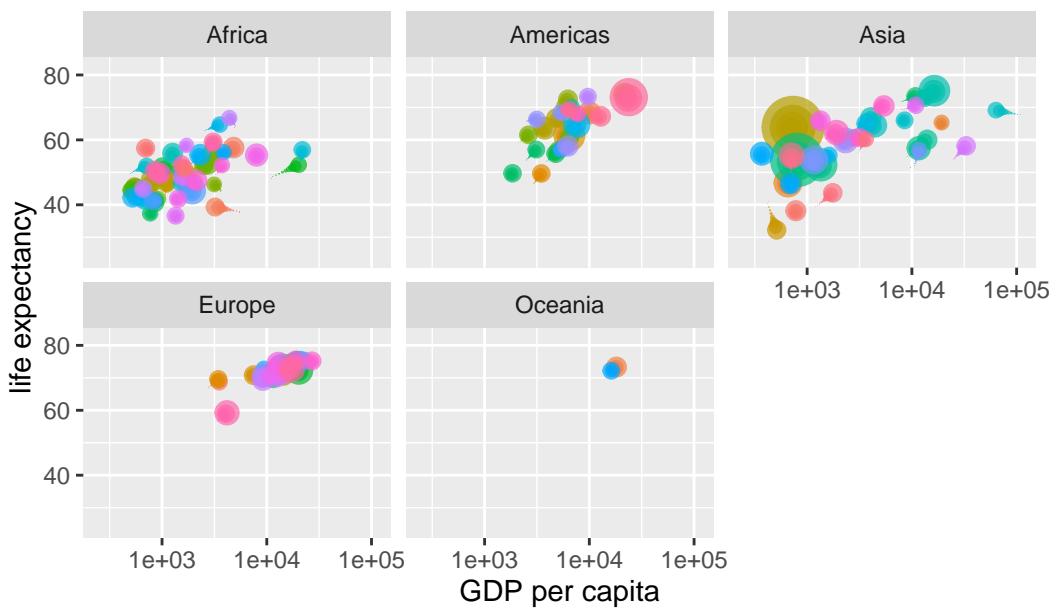
Year: 1975



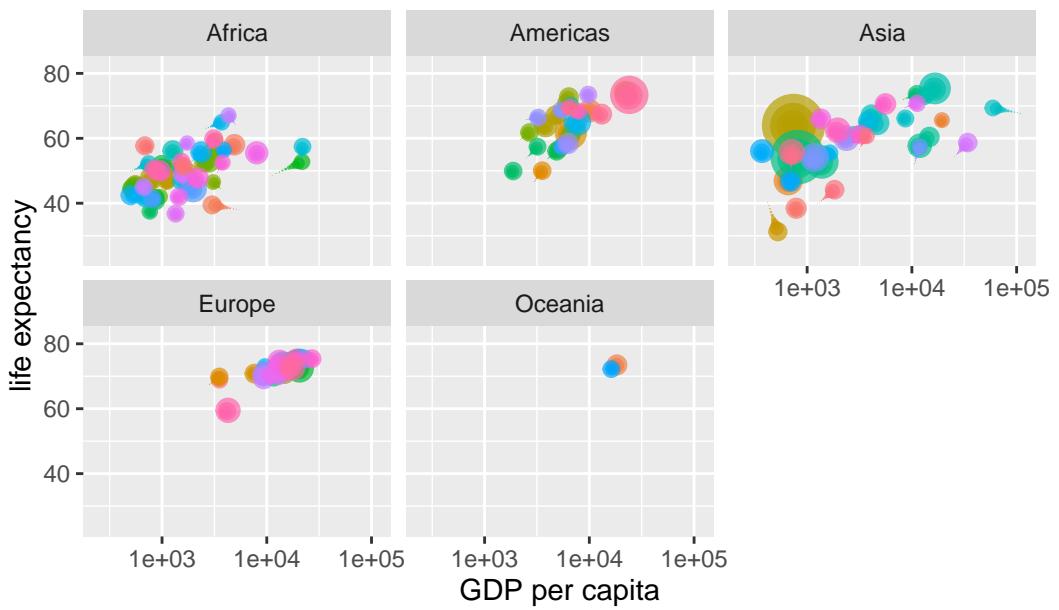
Year: 1976



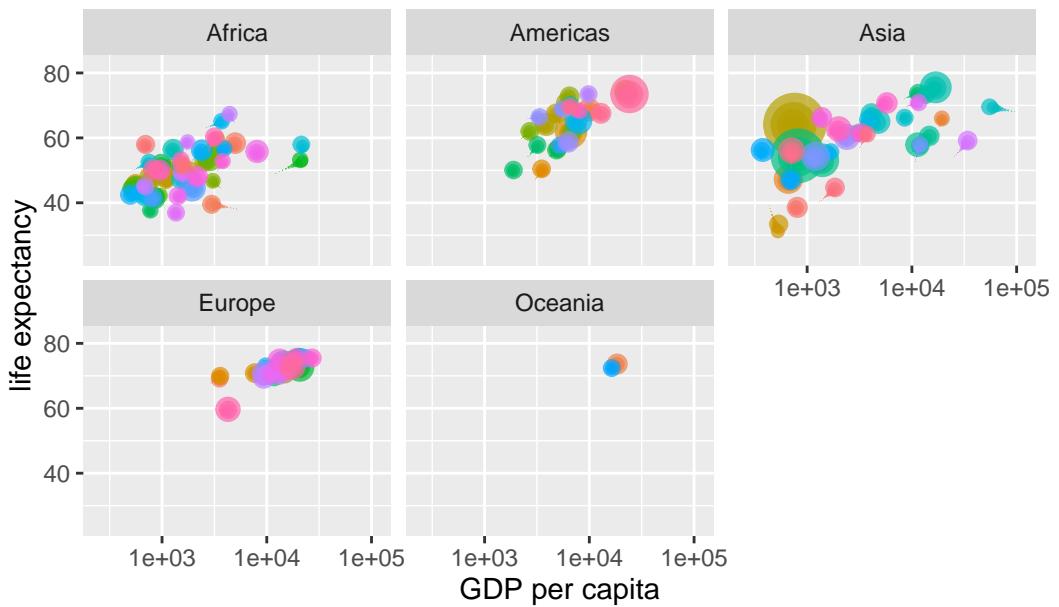
Year: 1976



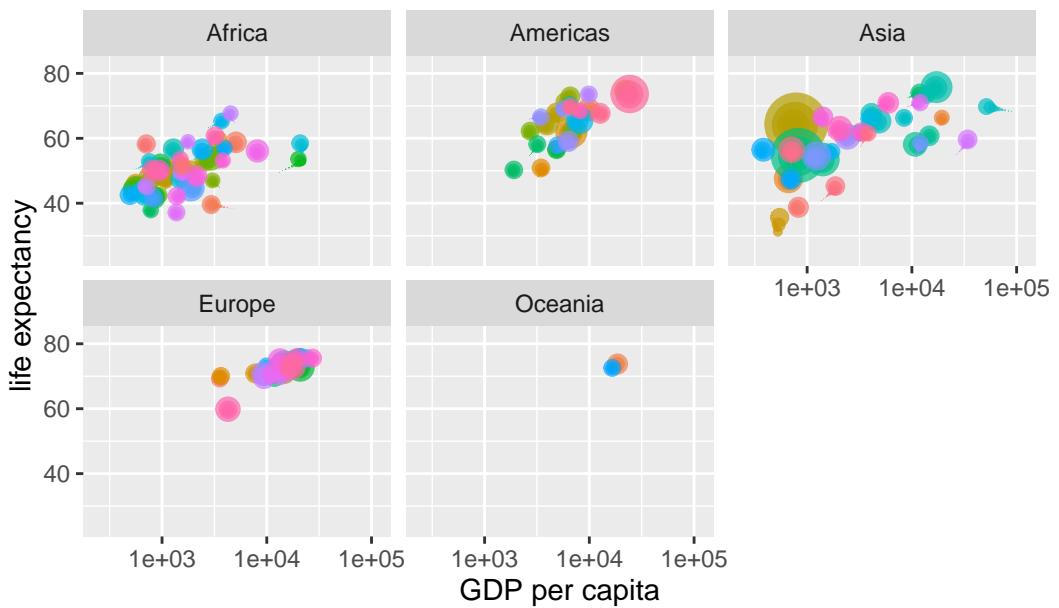
Year: 1977



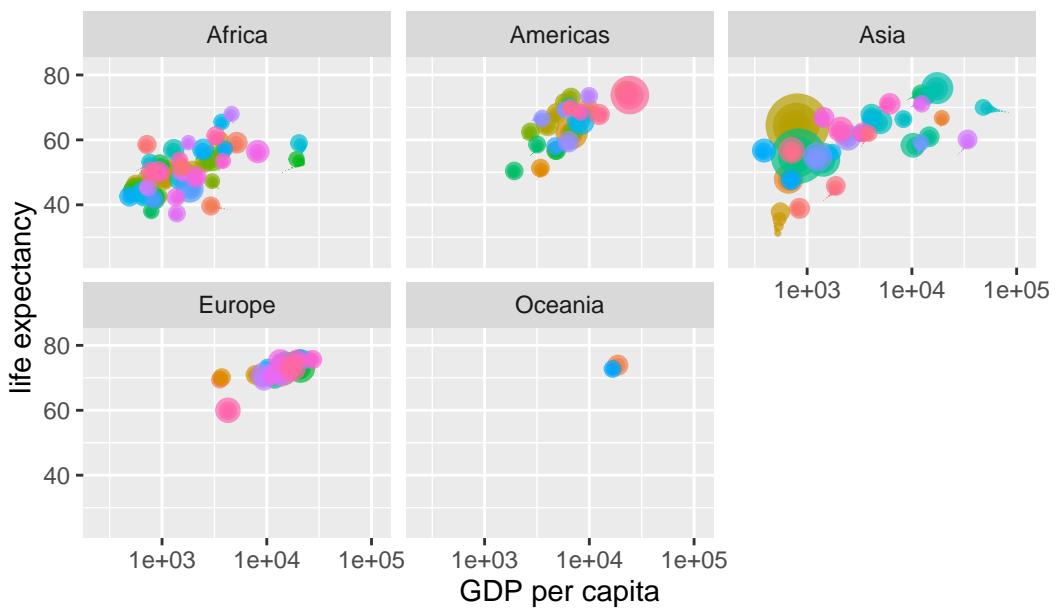
Year: 1978



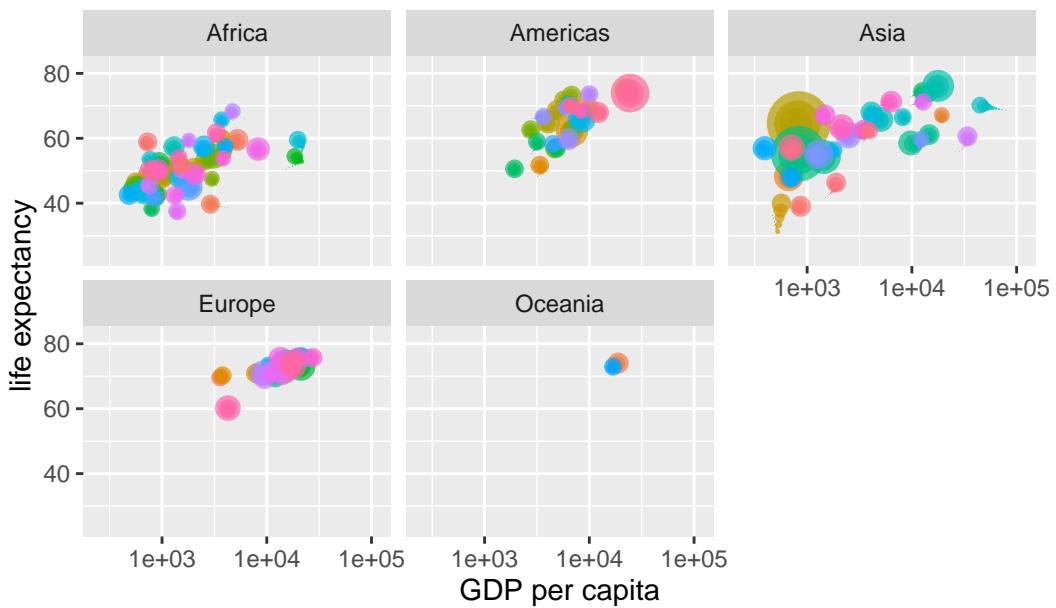
Year: 1978



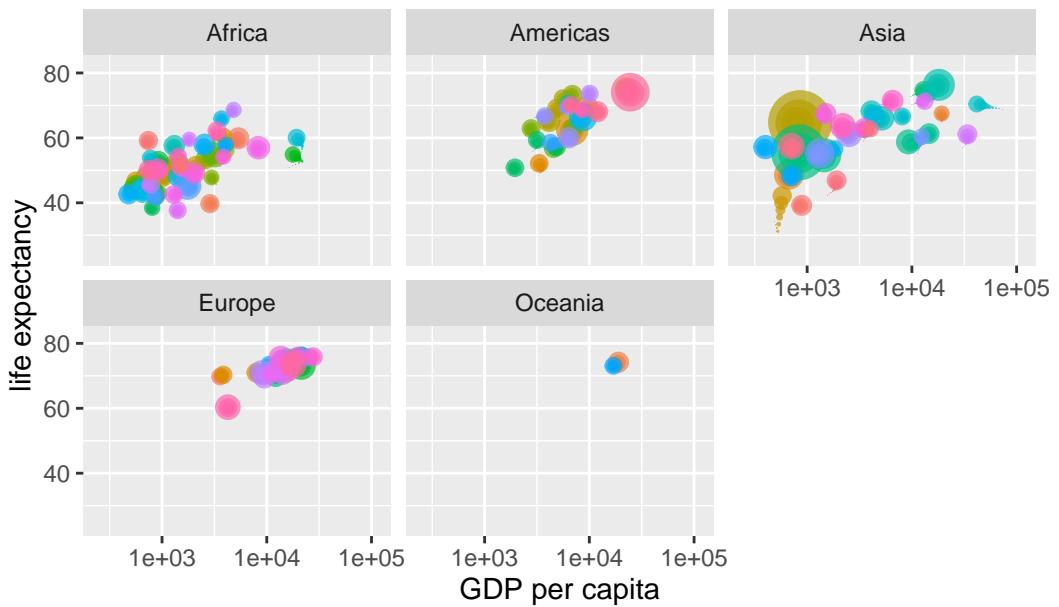
Year: 1979



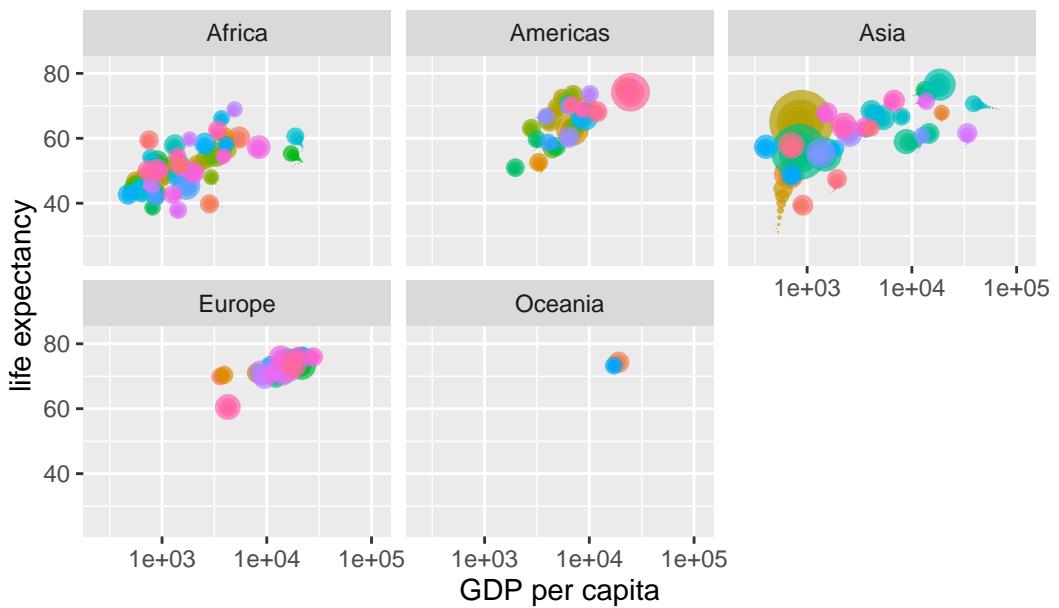
Year: 1979



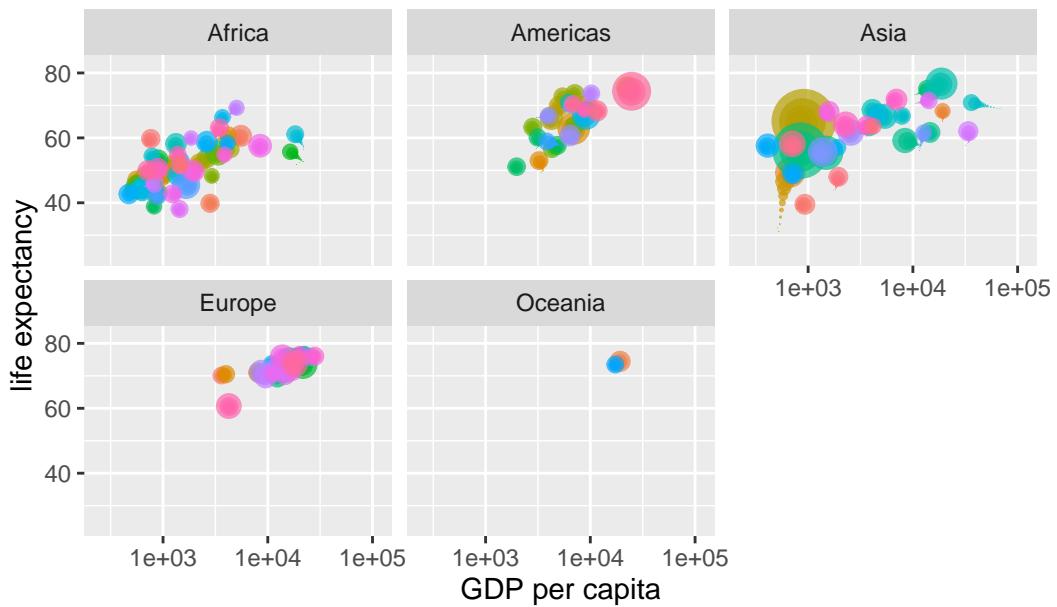
Year: 1980



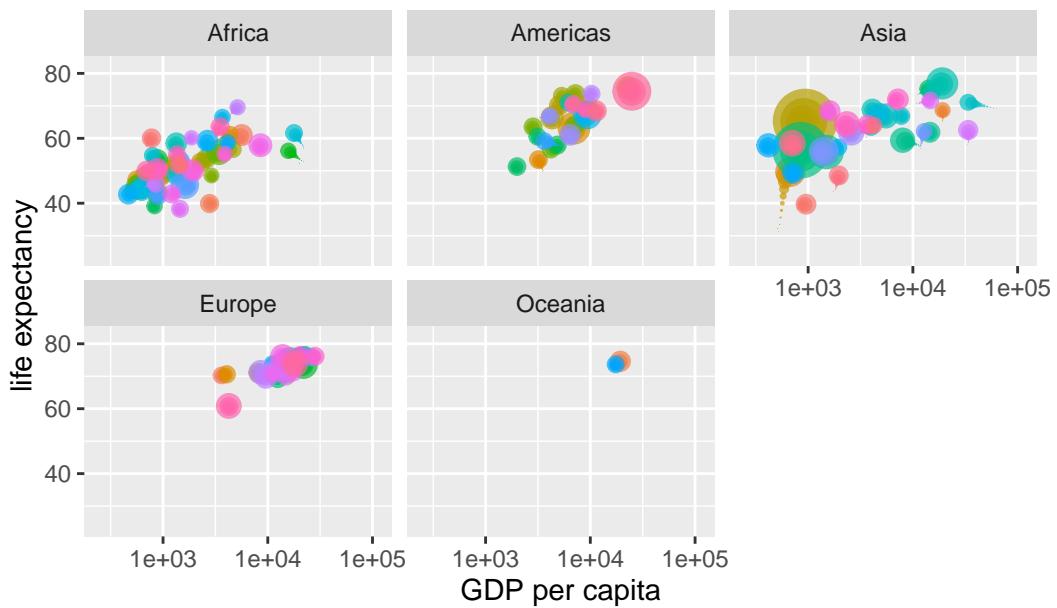
Year: 1980



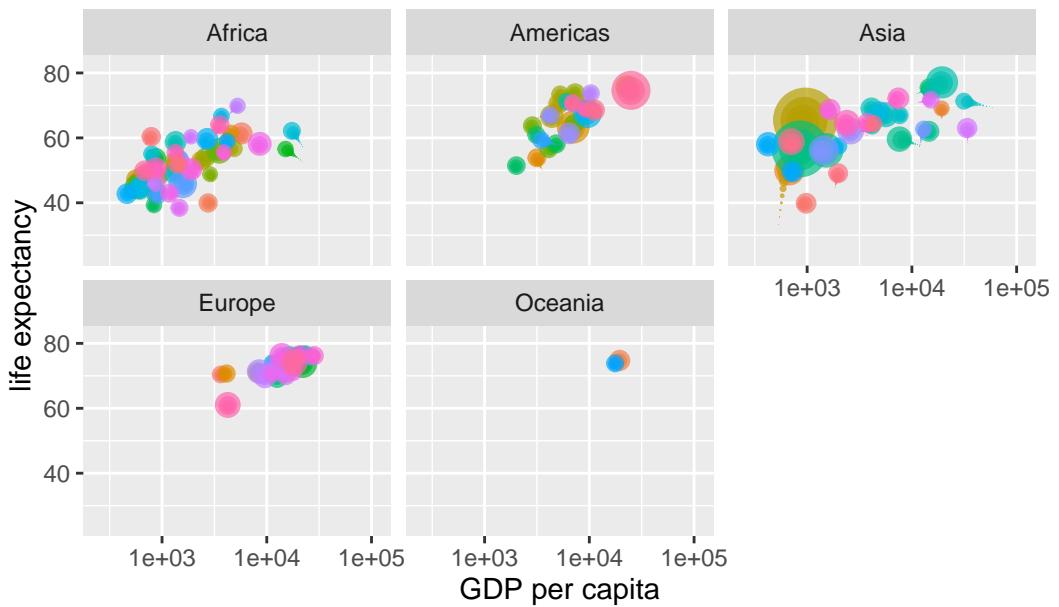
Year: 1981



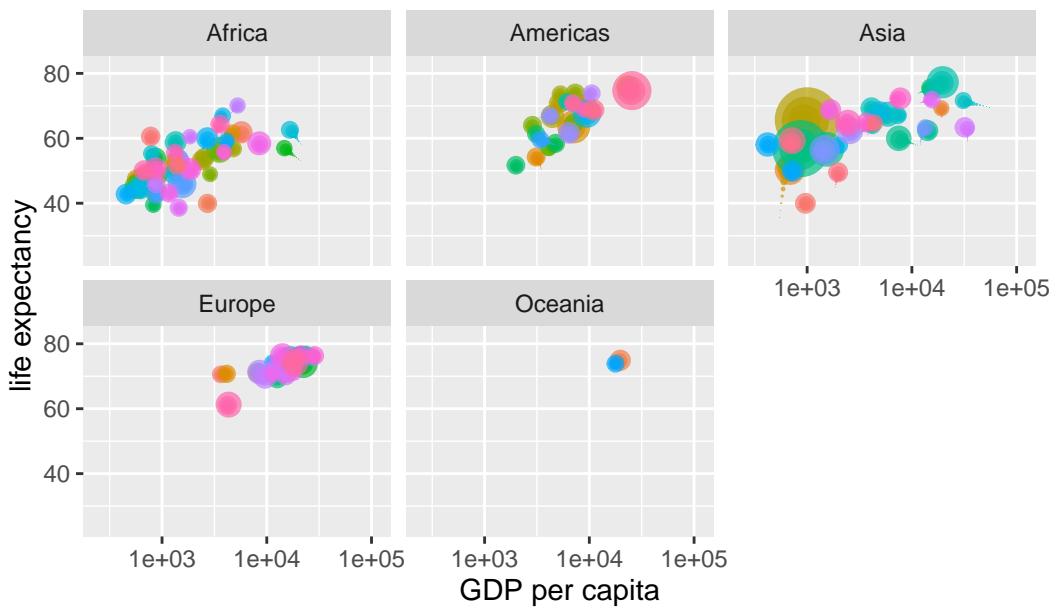
Year: 1981



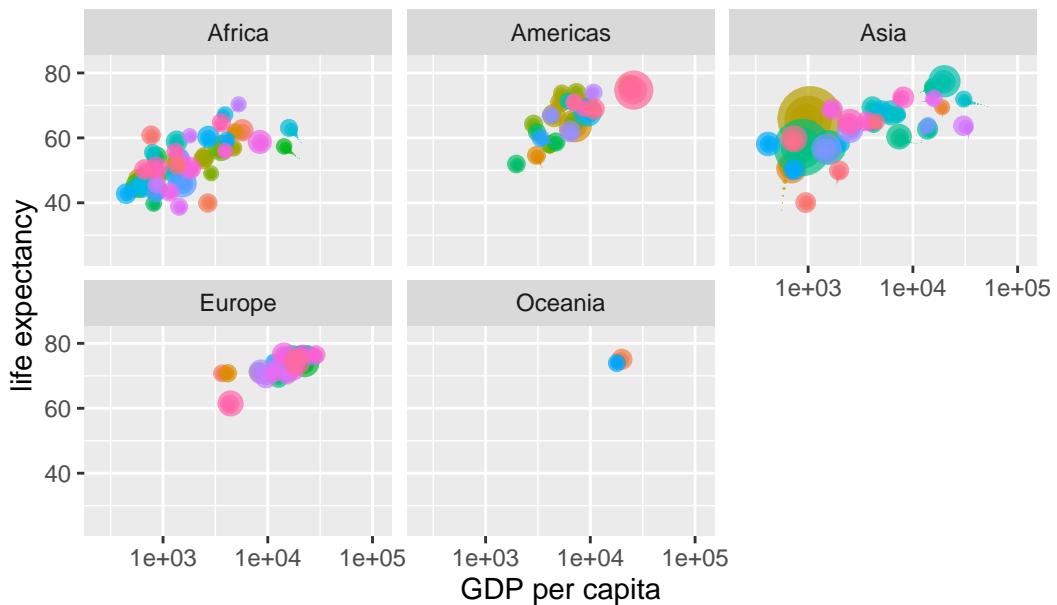
Year: 1982



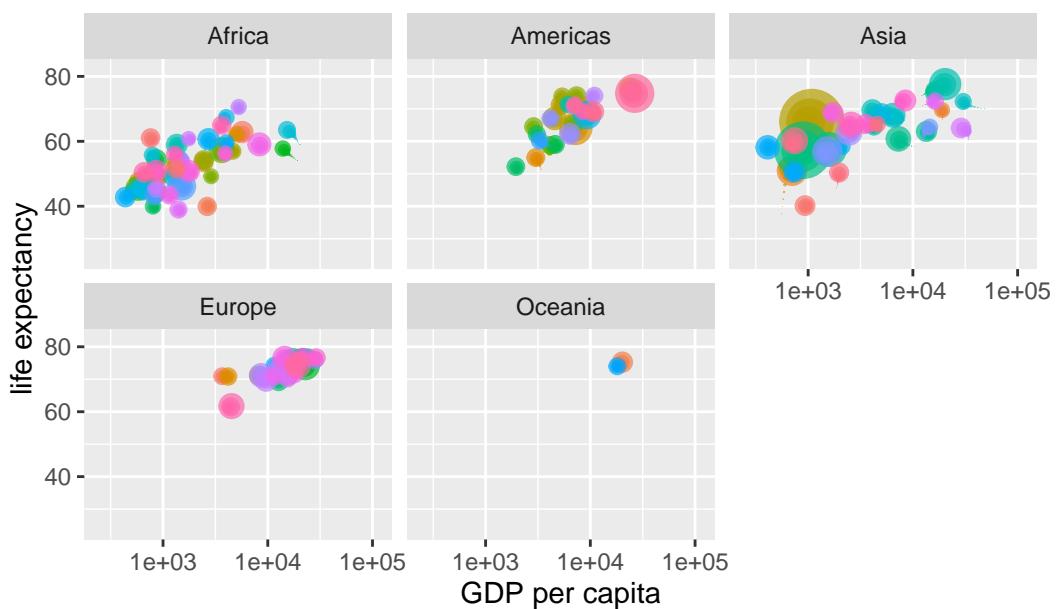
Year: 1983



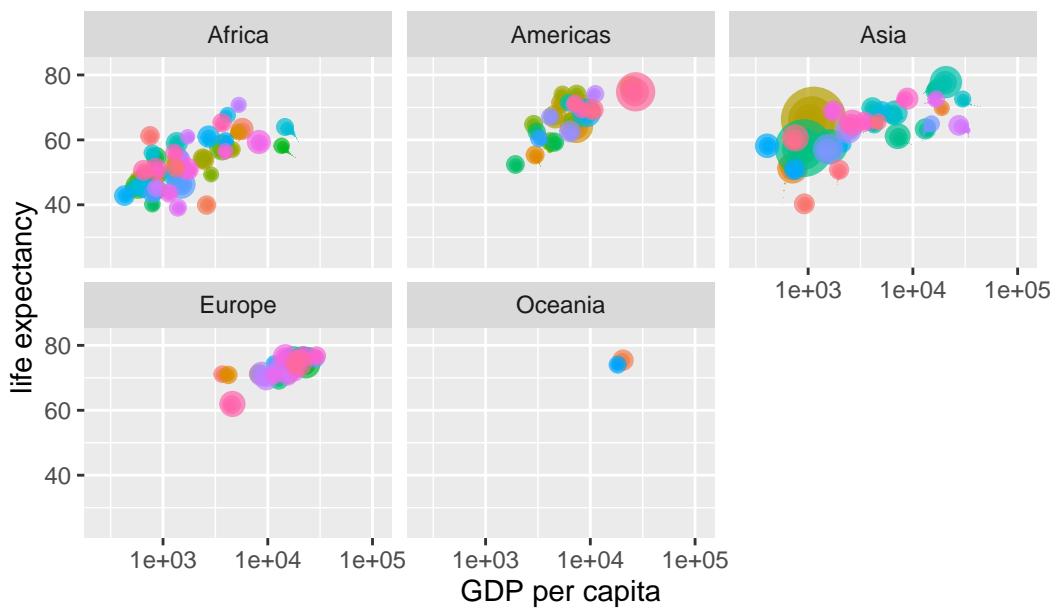
Year: 1983



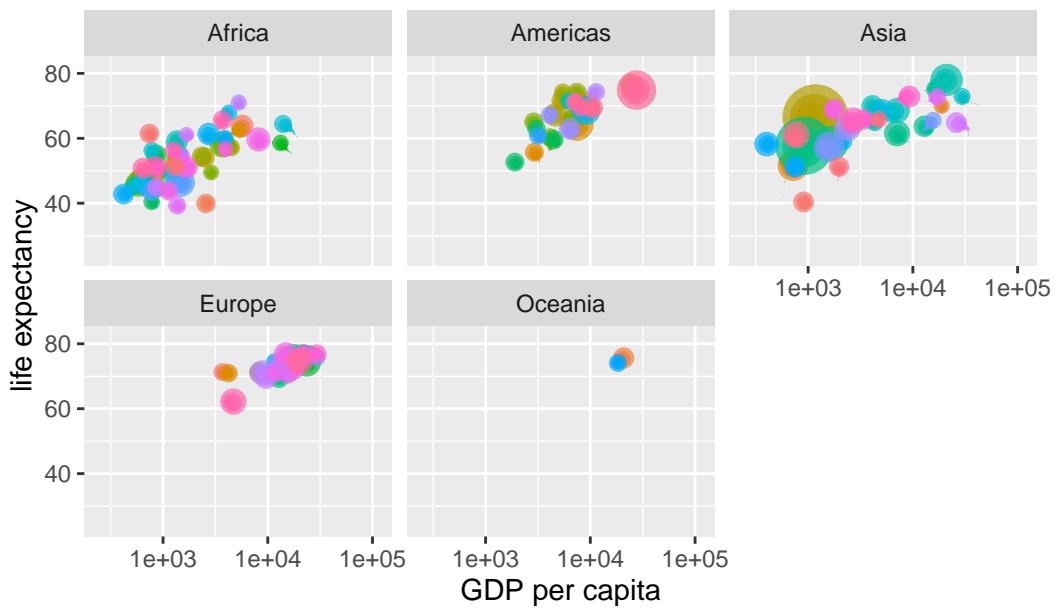
Year: 1984



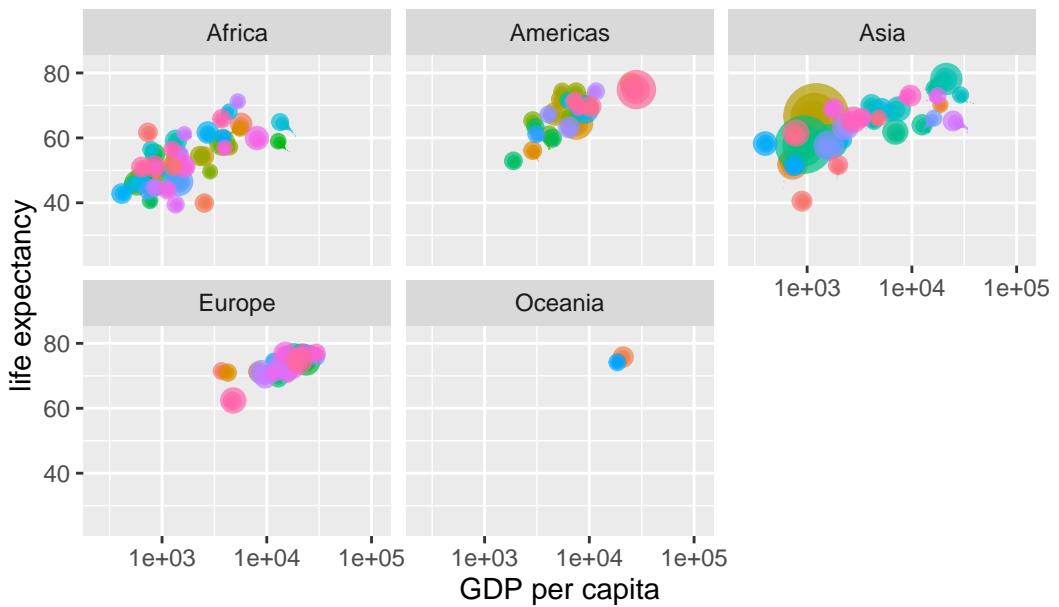
Year: 1984



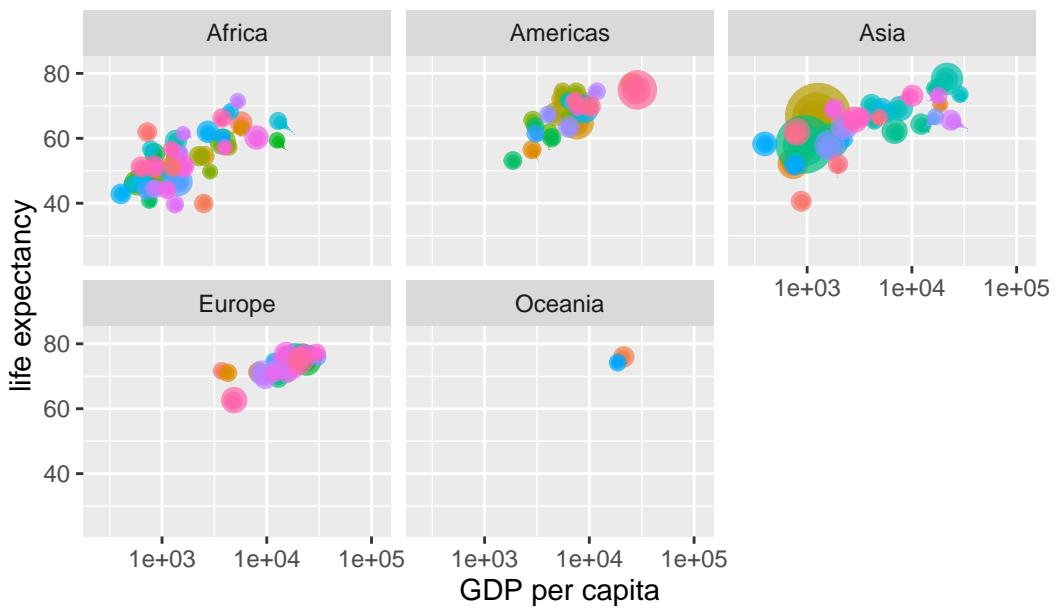
Year: 1985



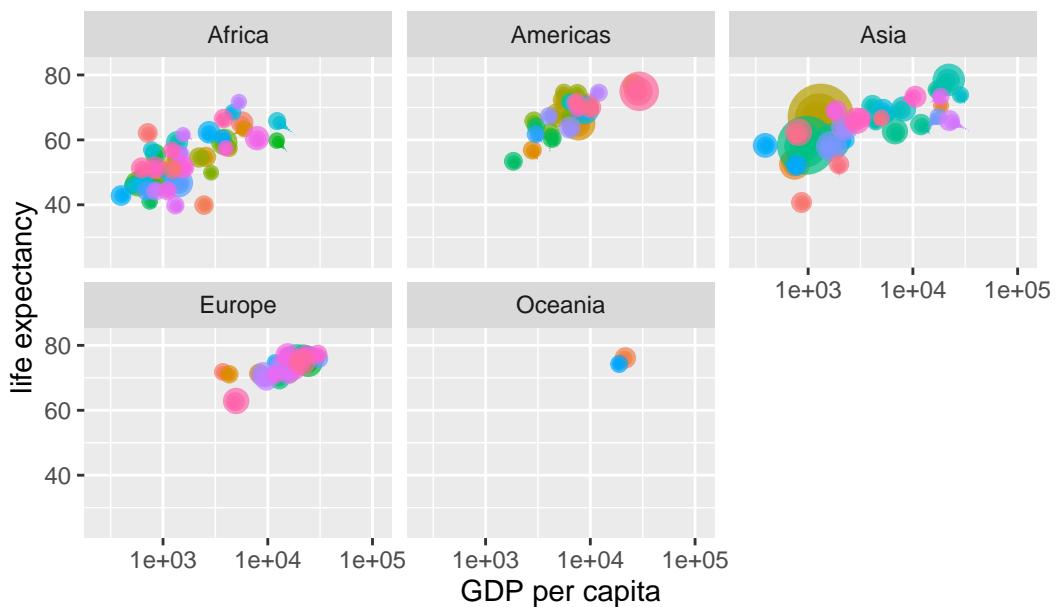
Year: 1985



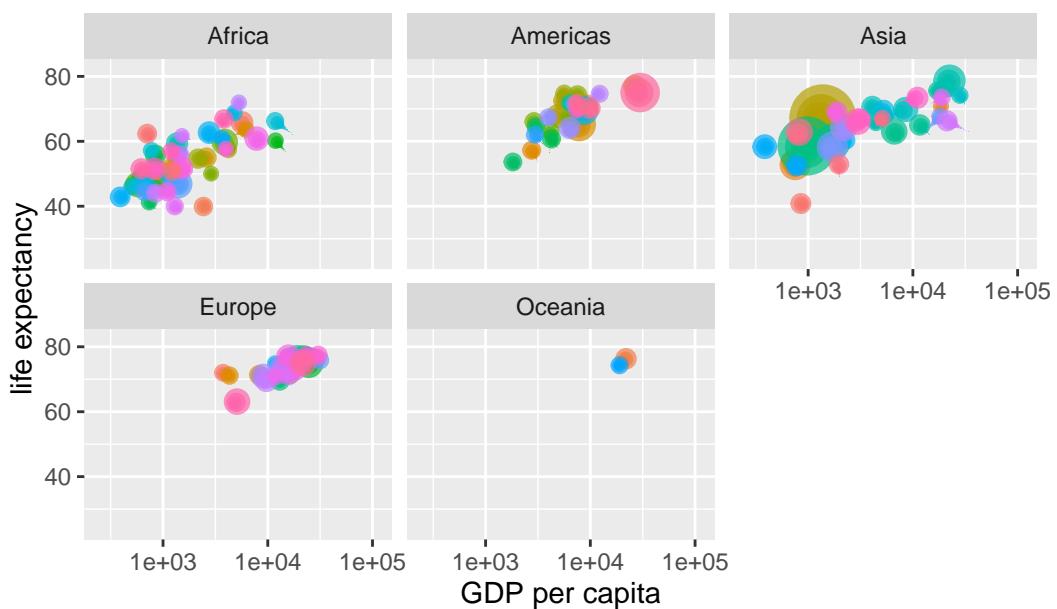
Year: 1986



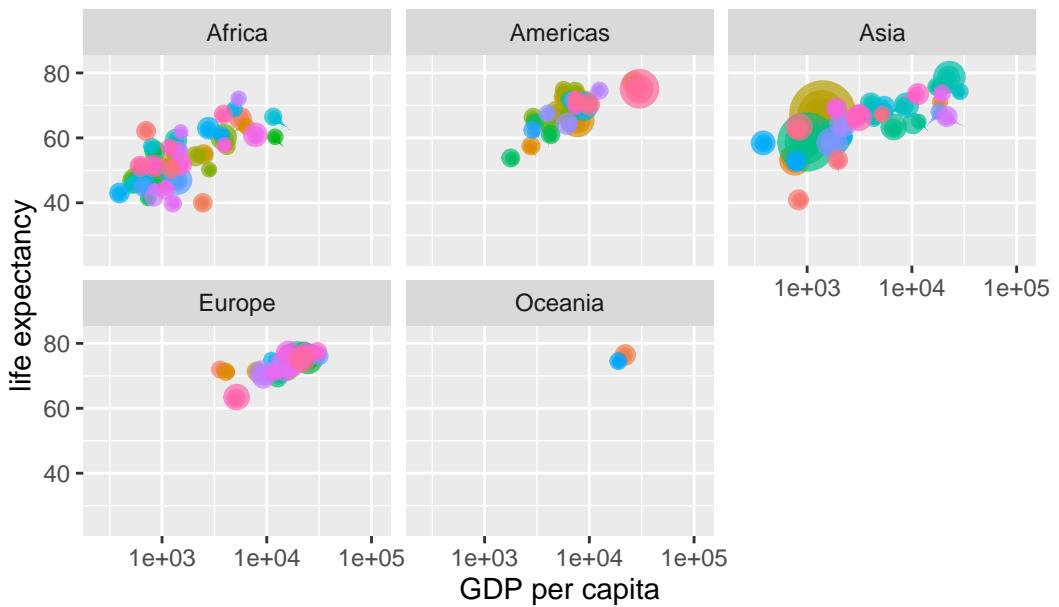
Year: 1986



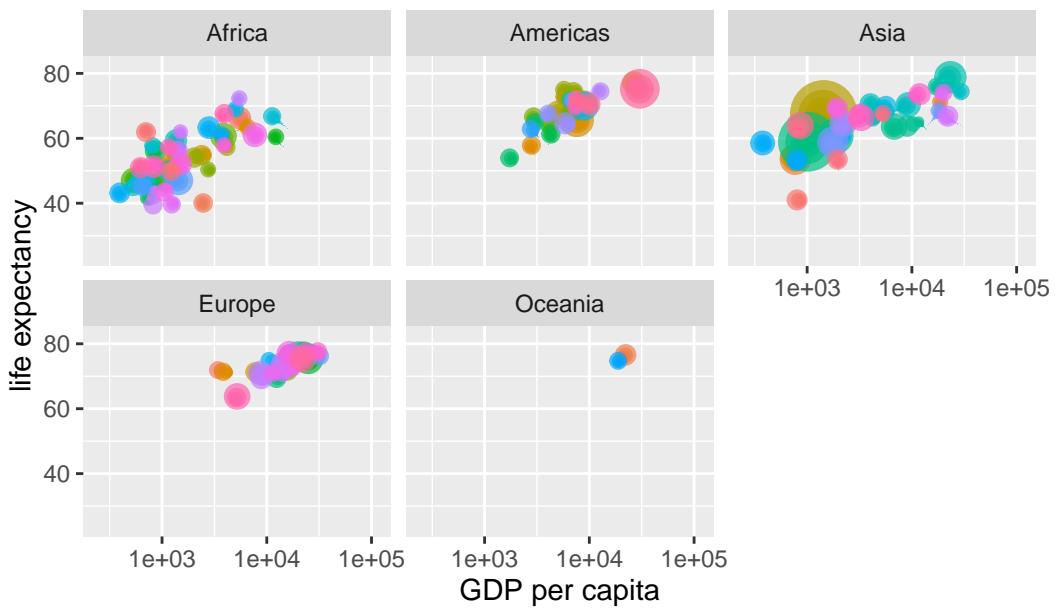
Year: 1987



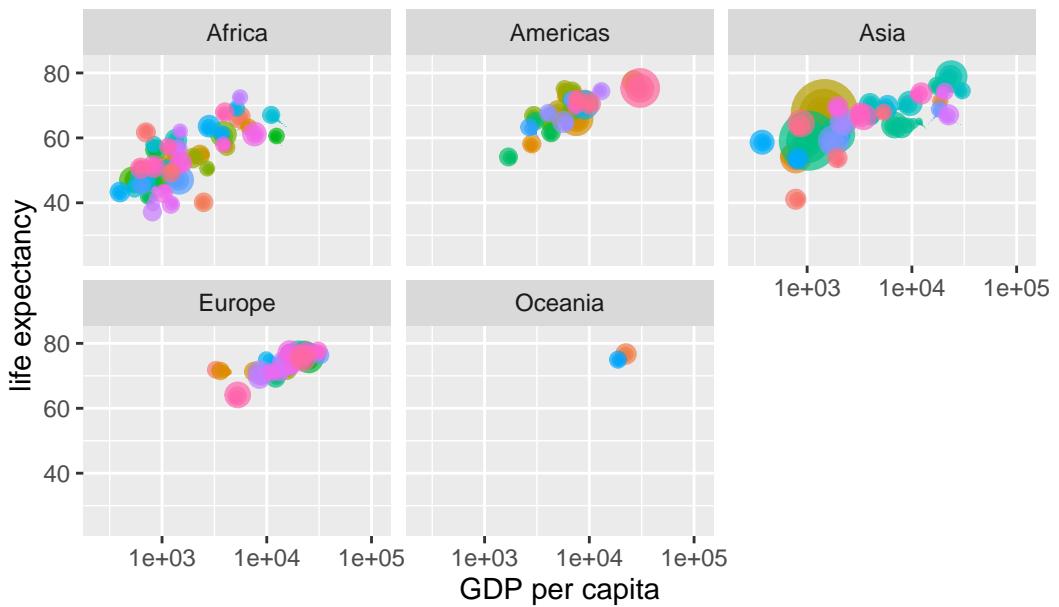
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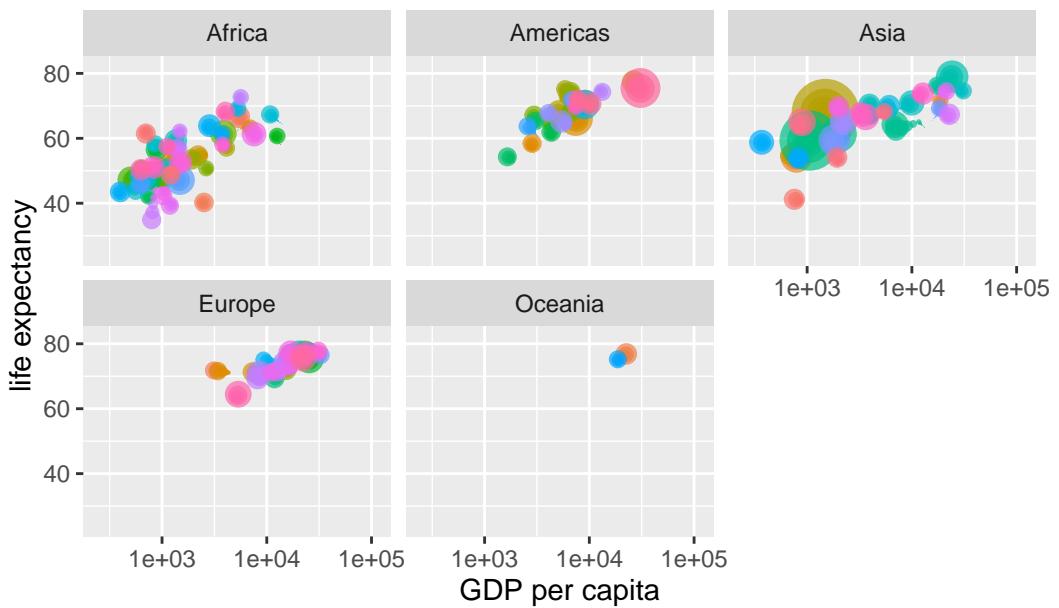
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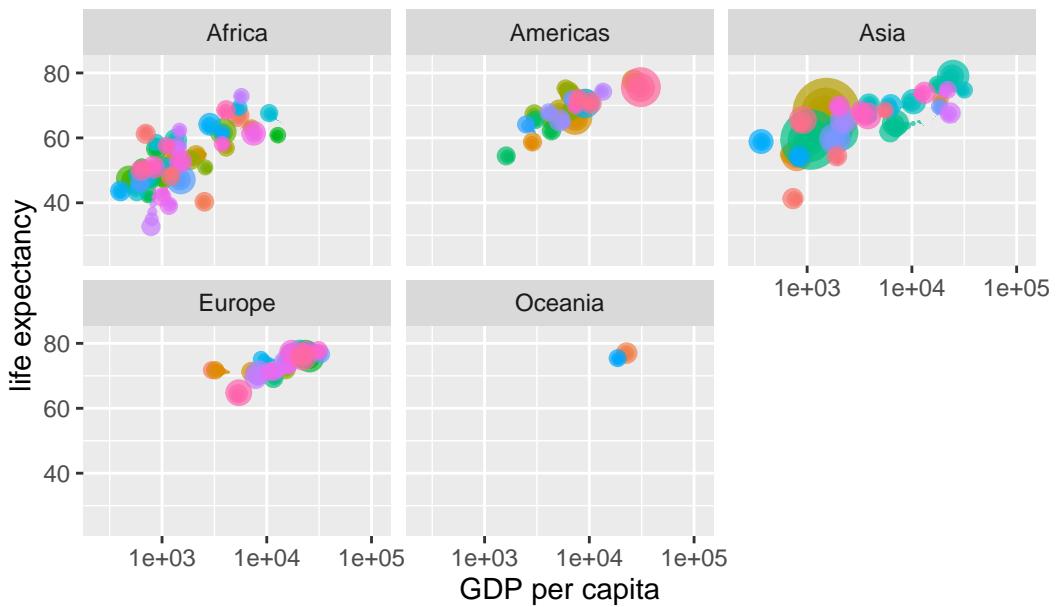
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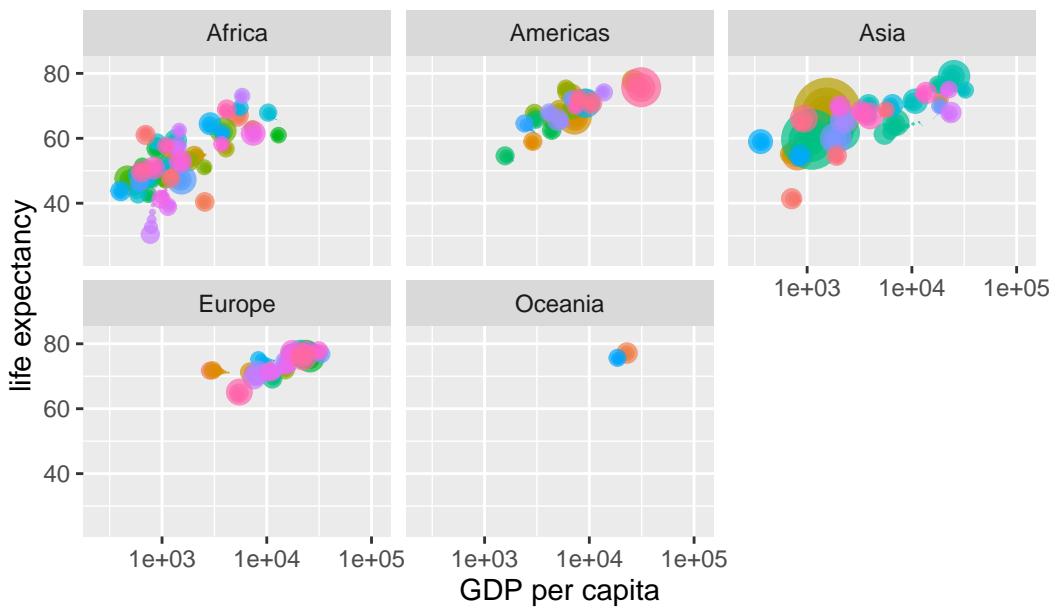
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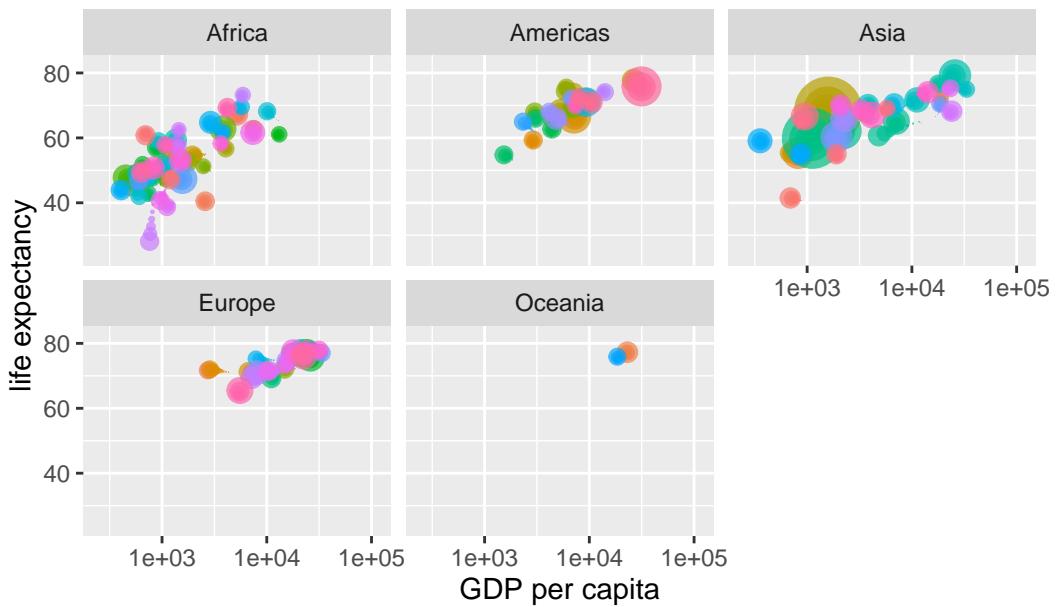
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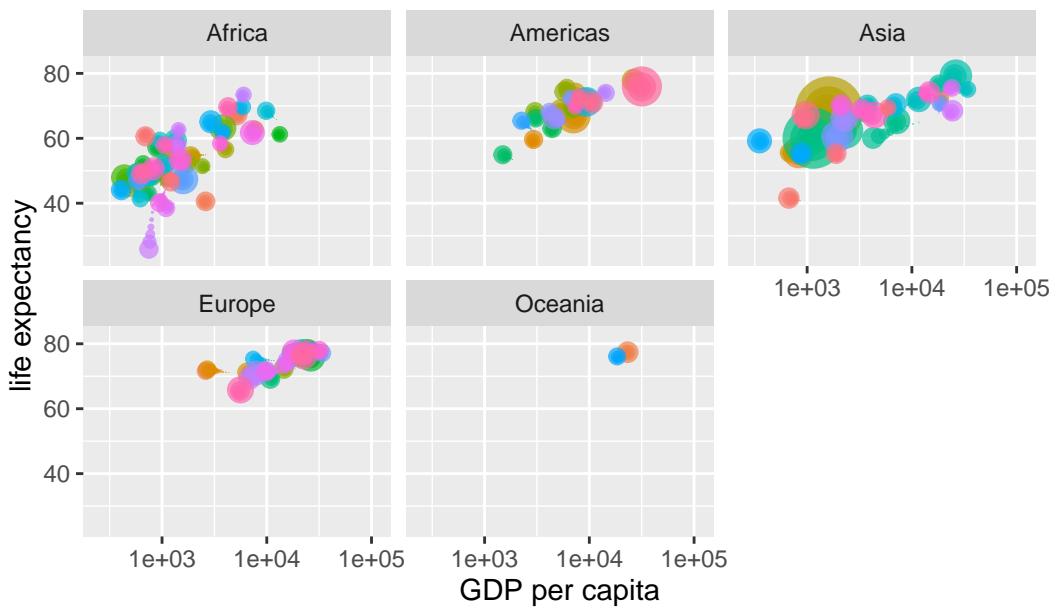
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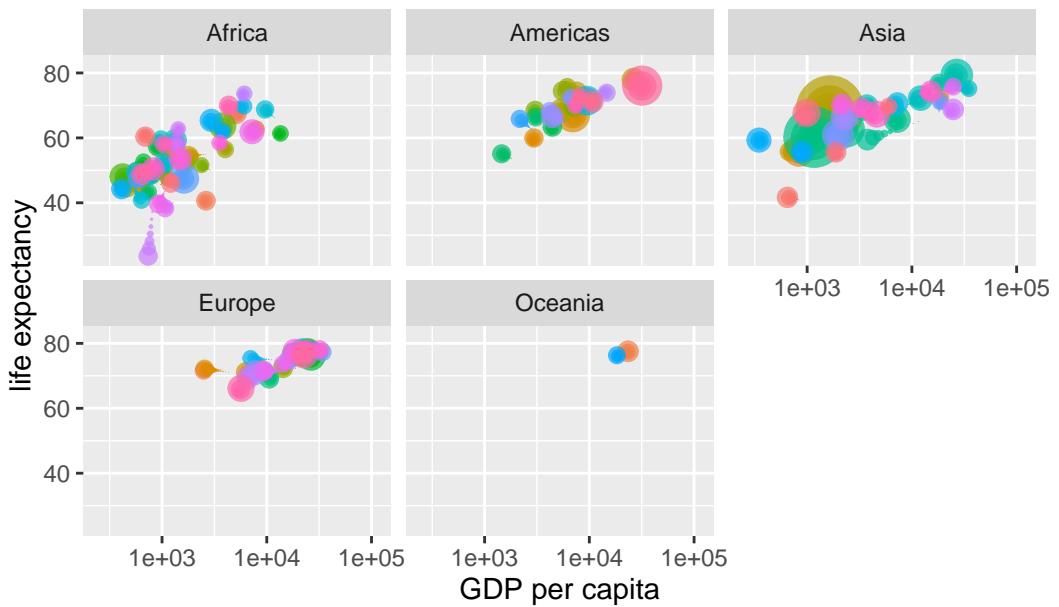
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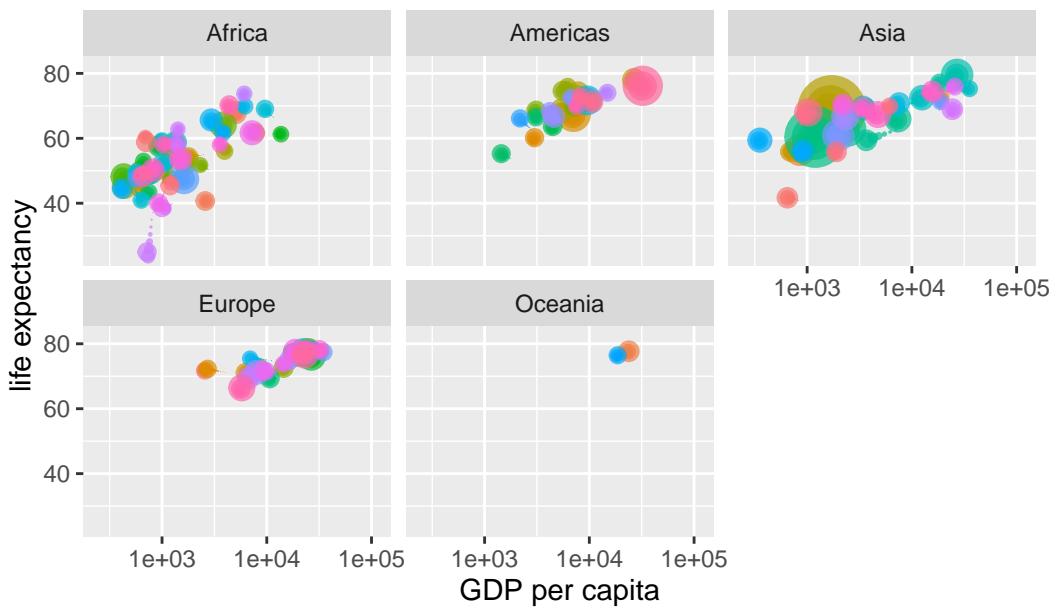
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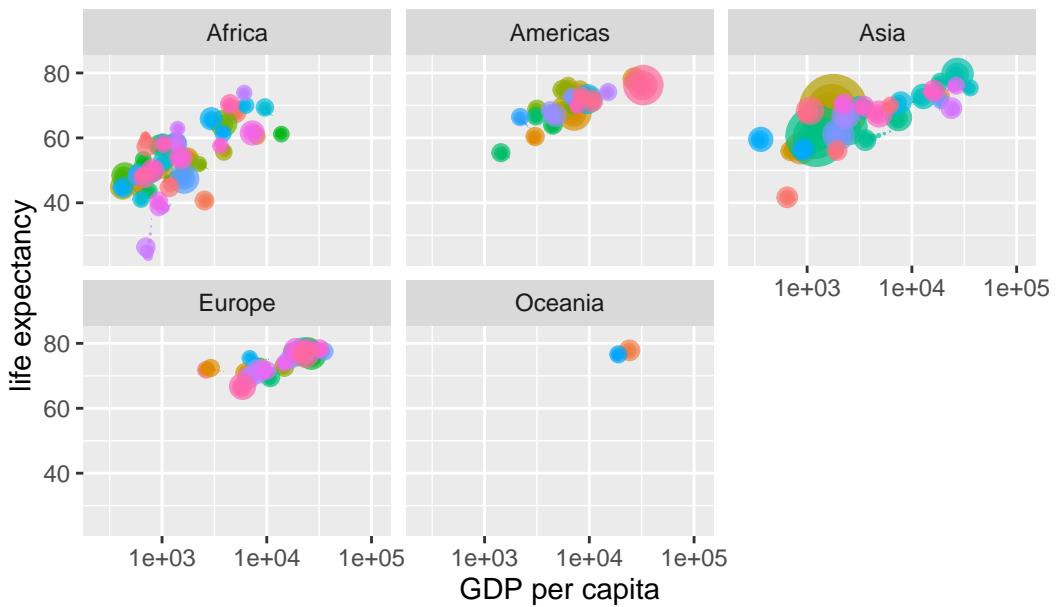
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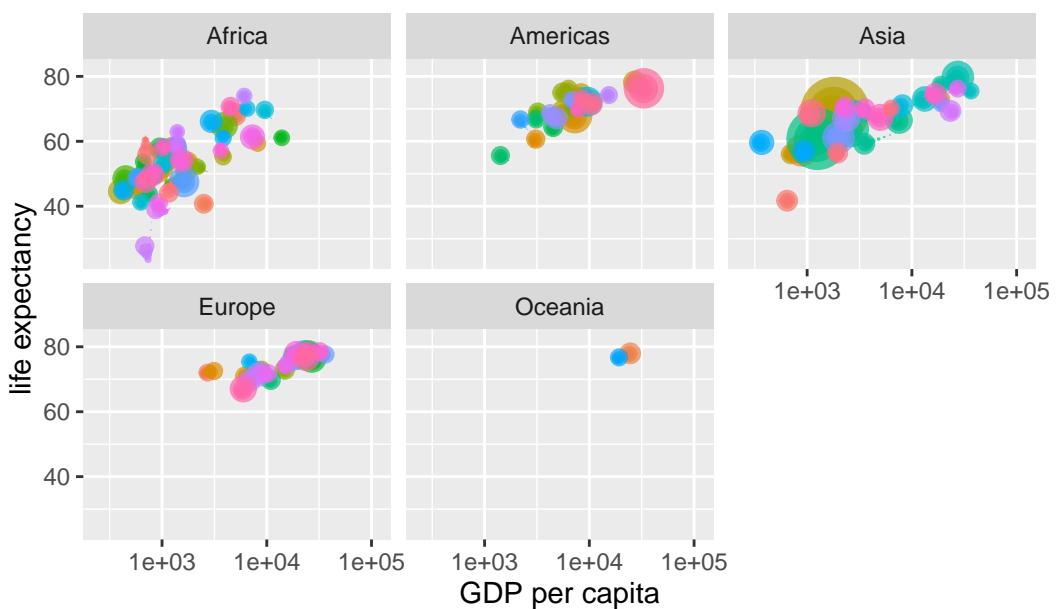
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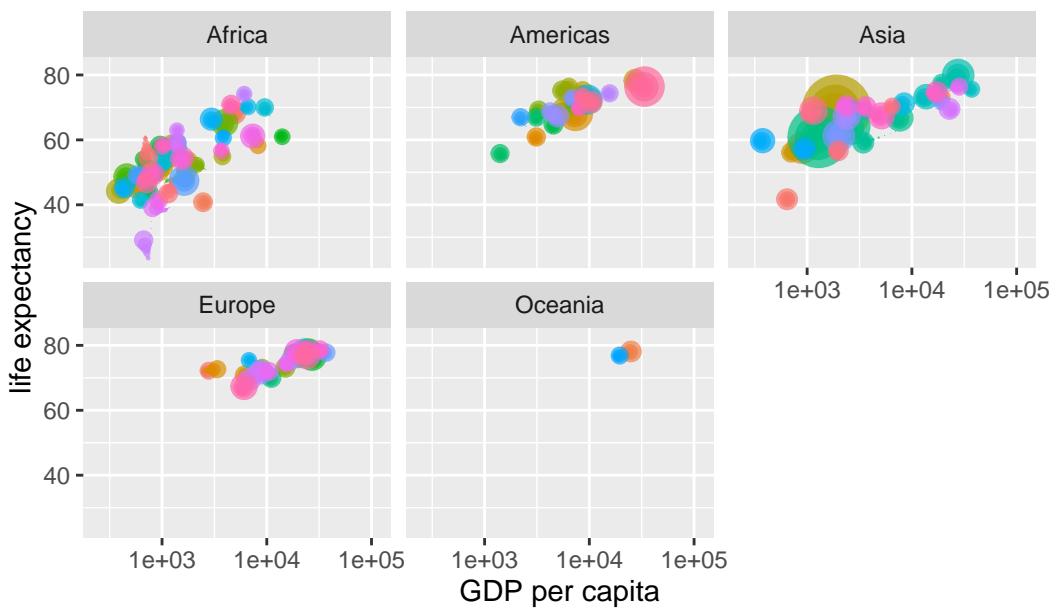
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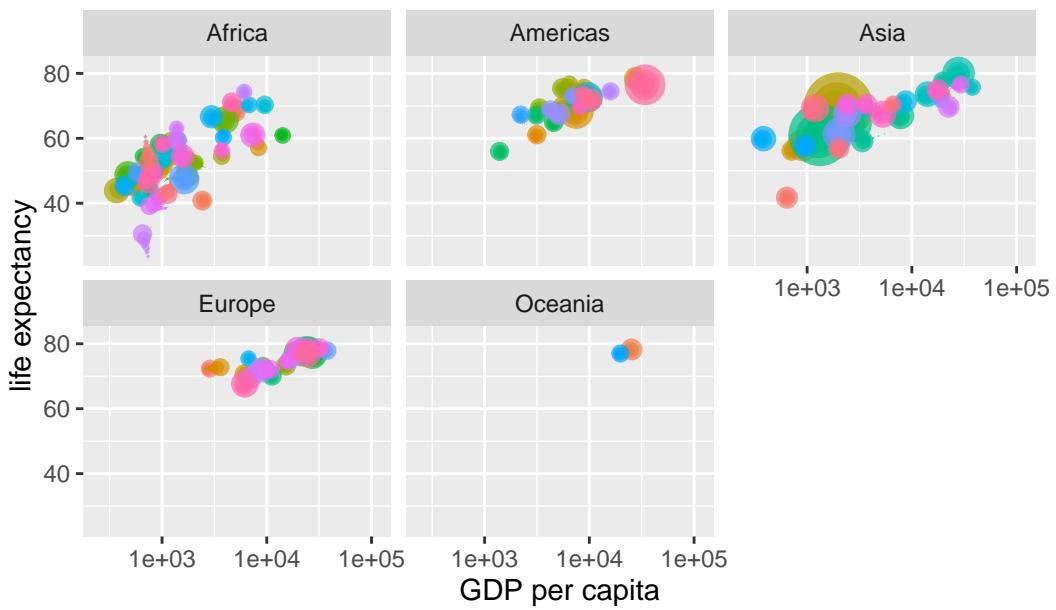
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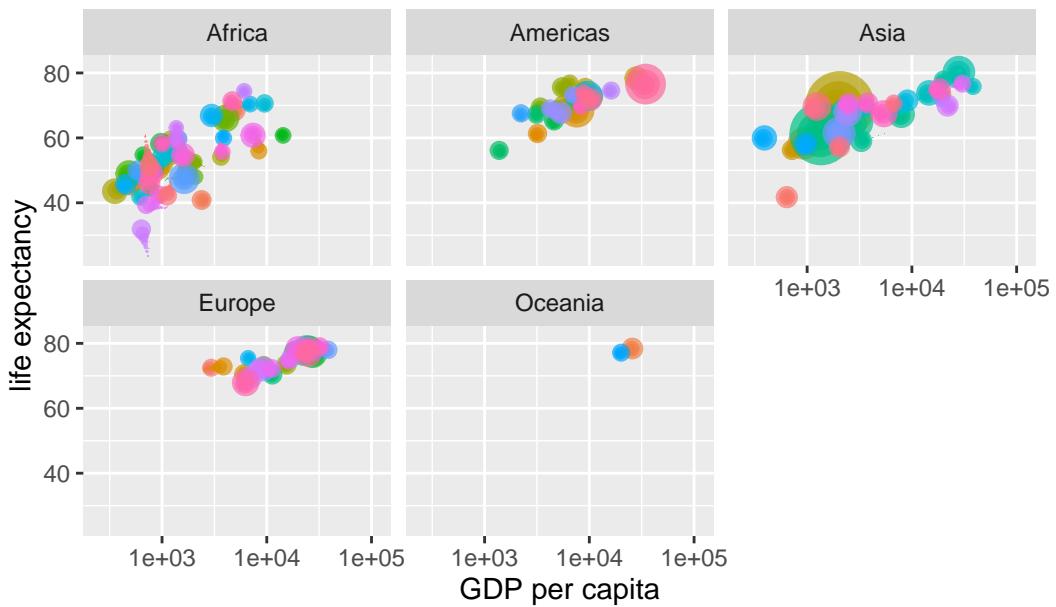
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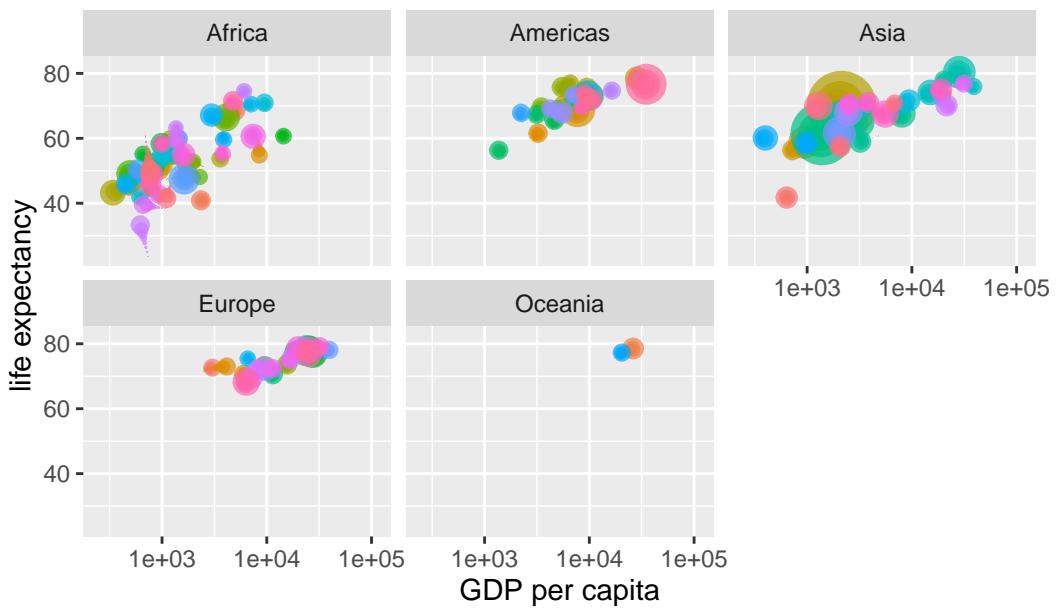
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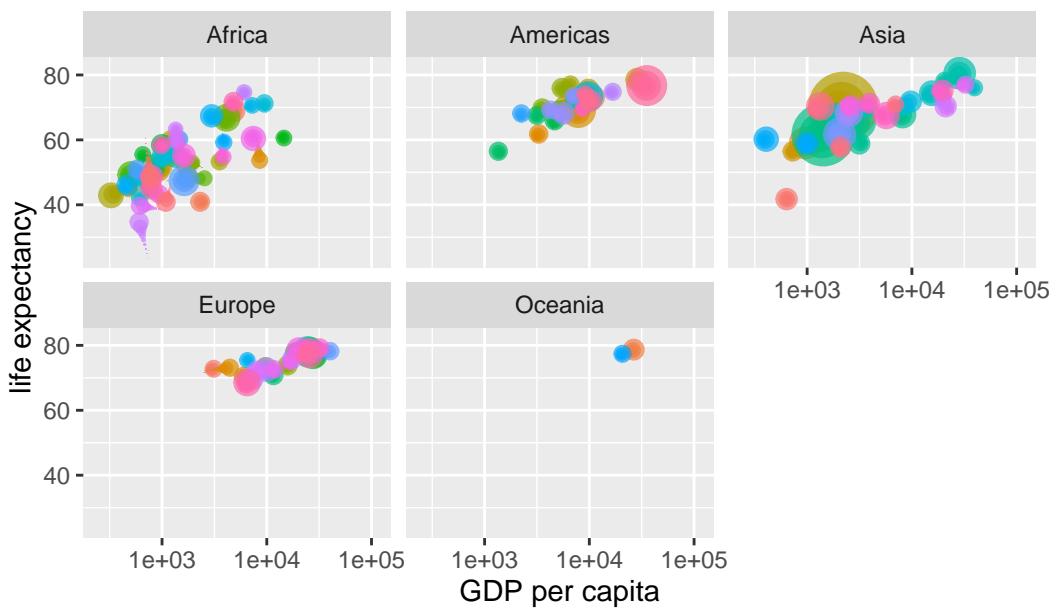
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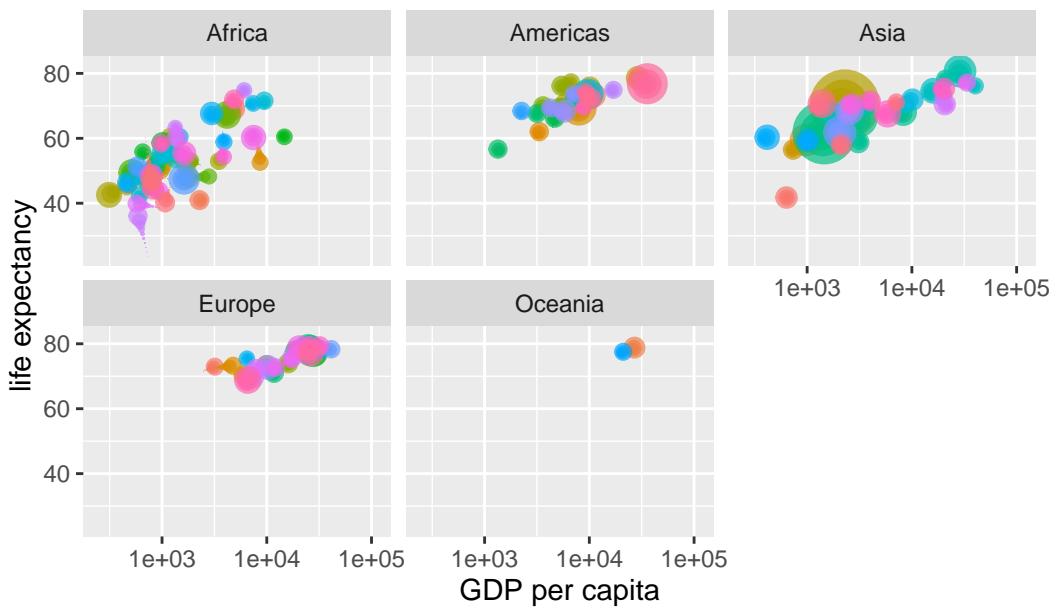
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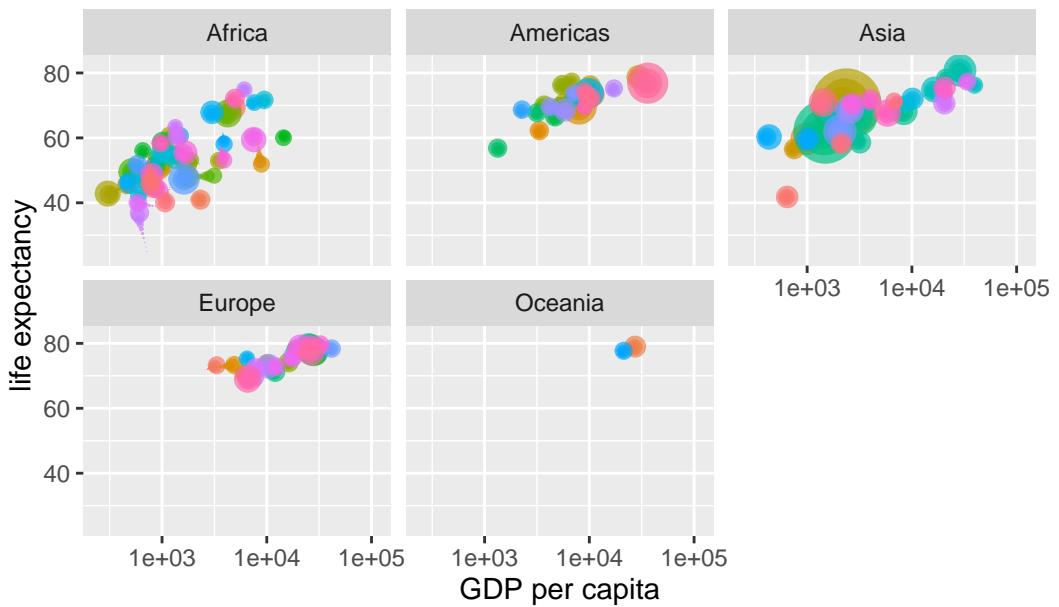
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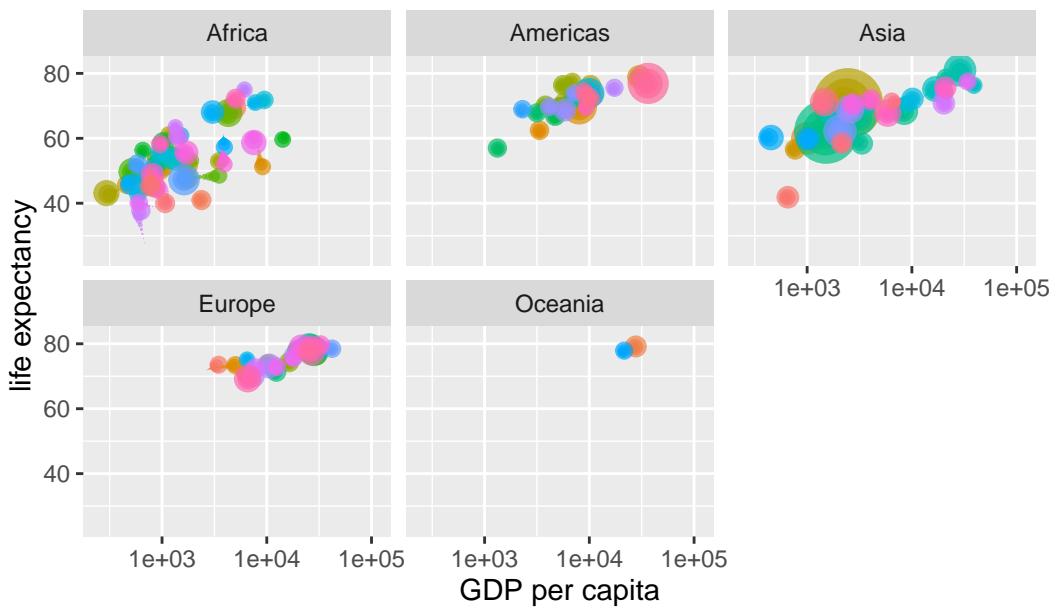
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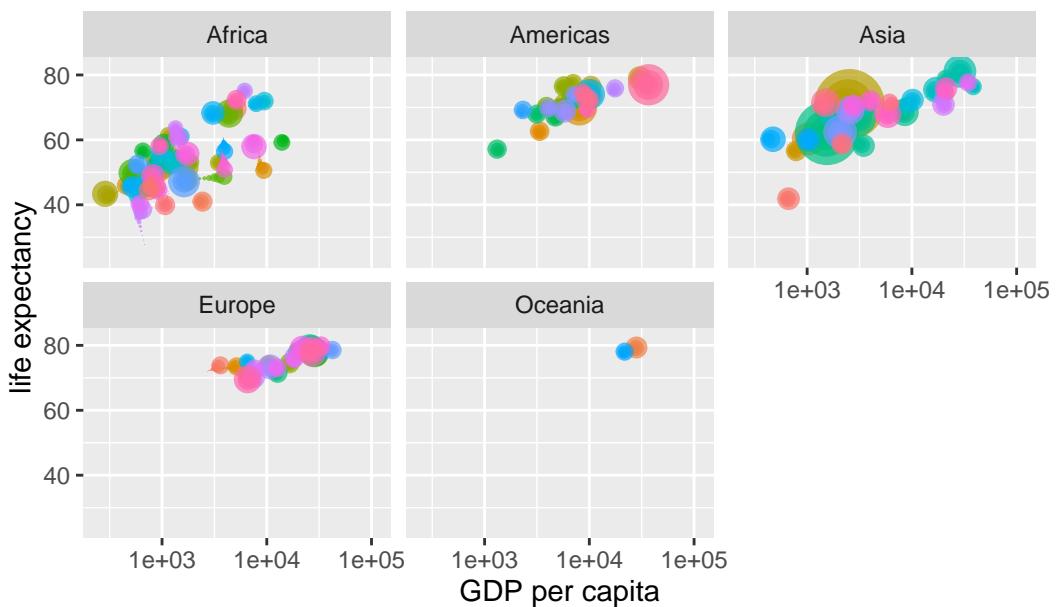
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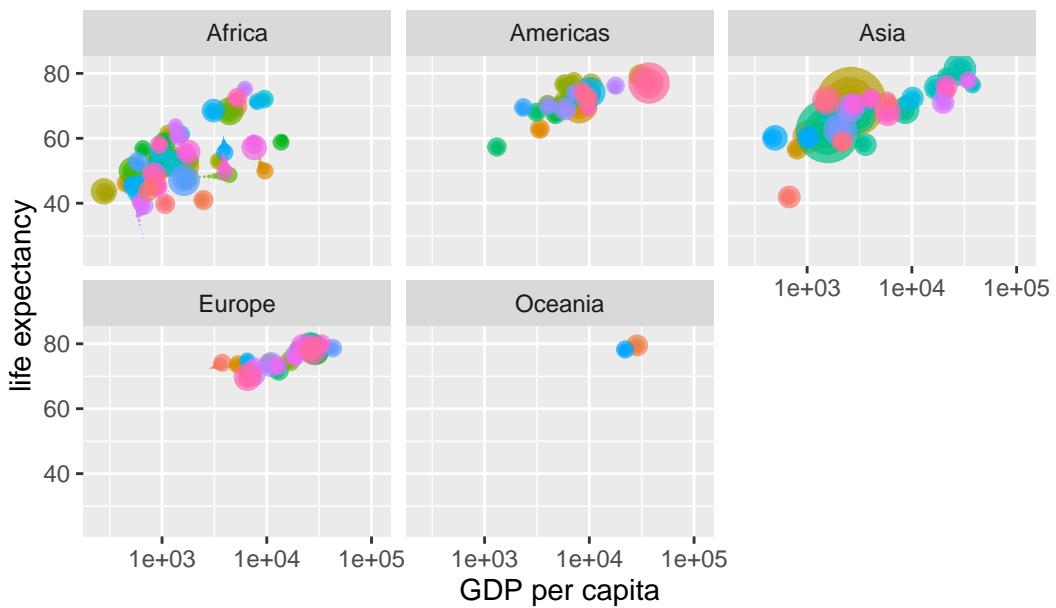
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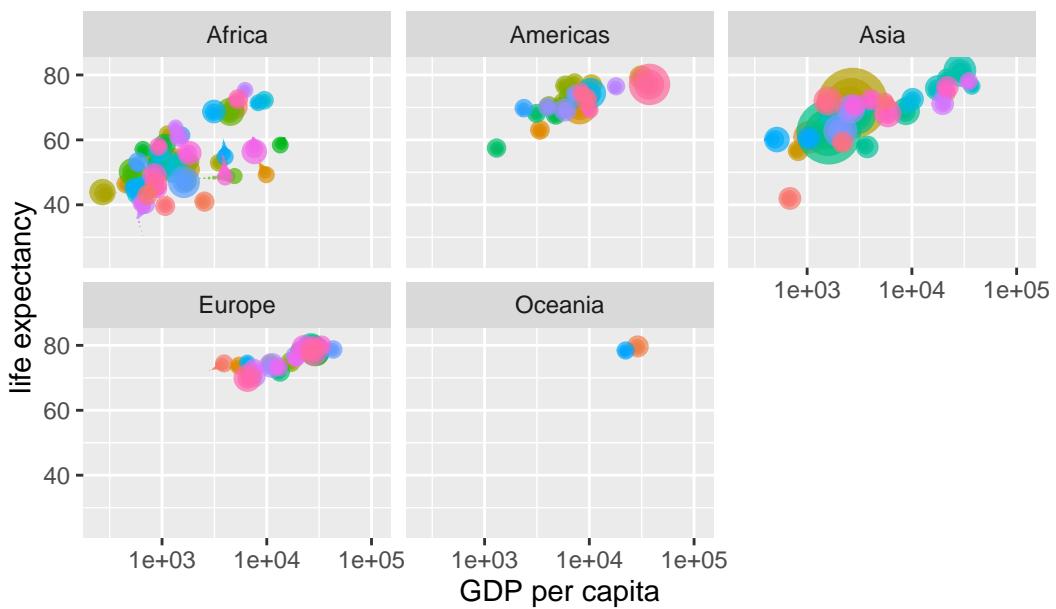
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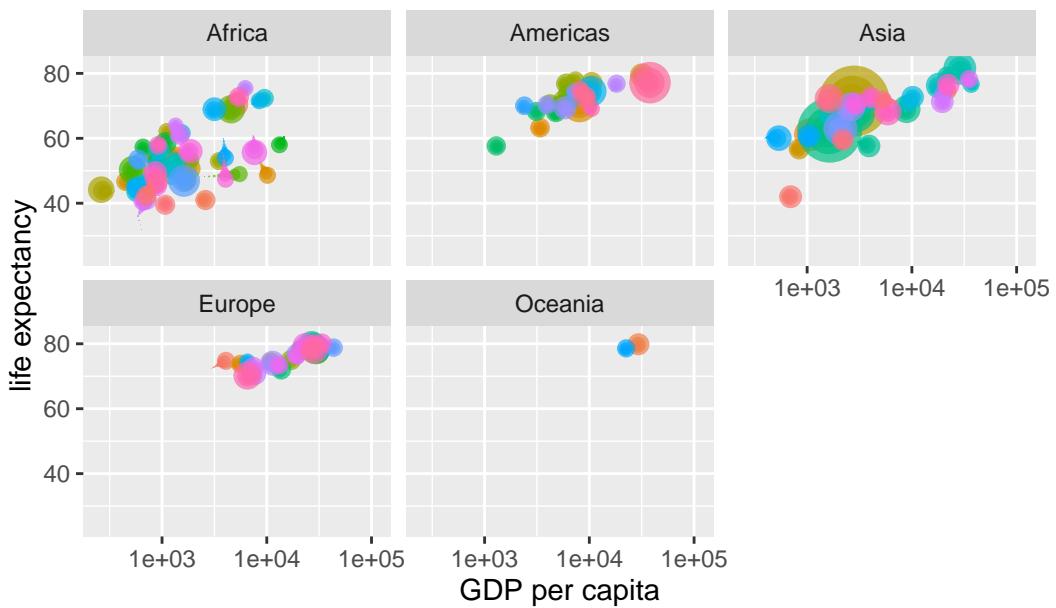
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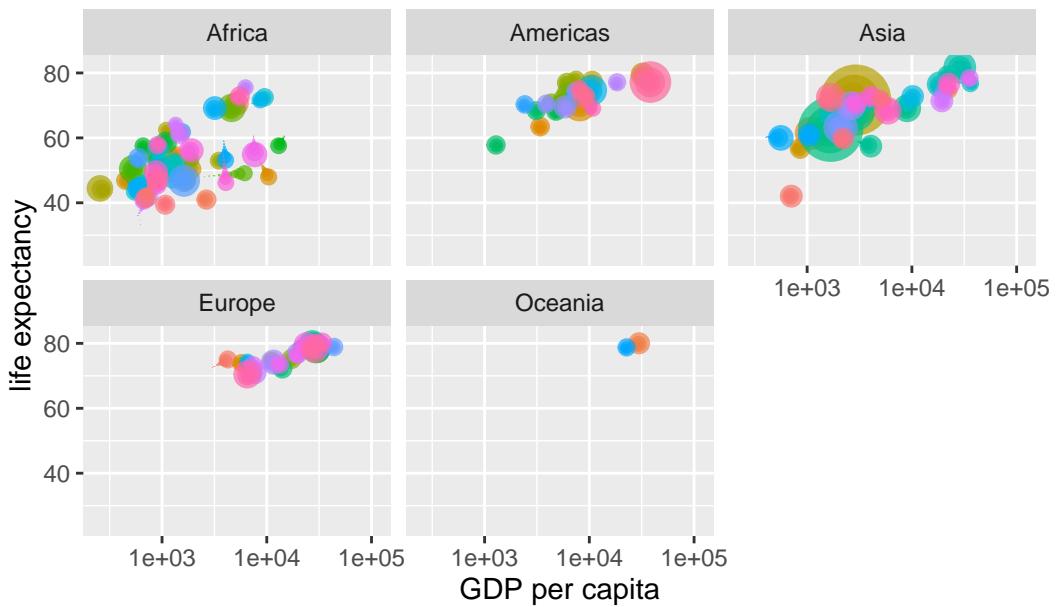
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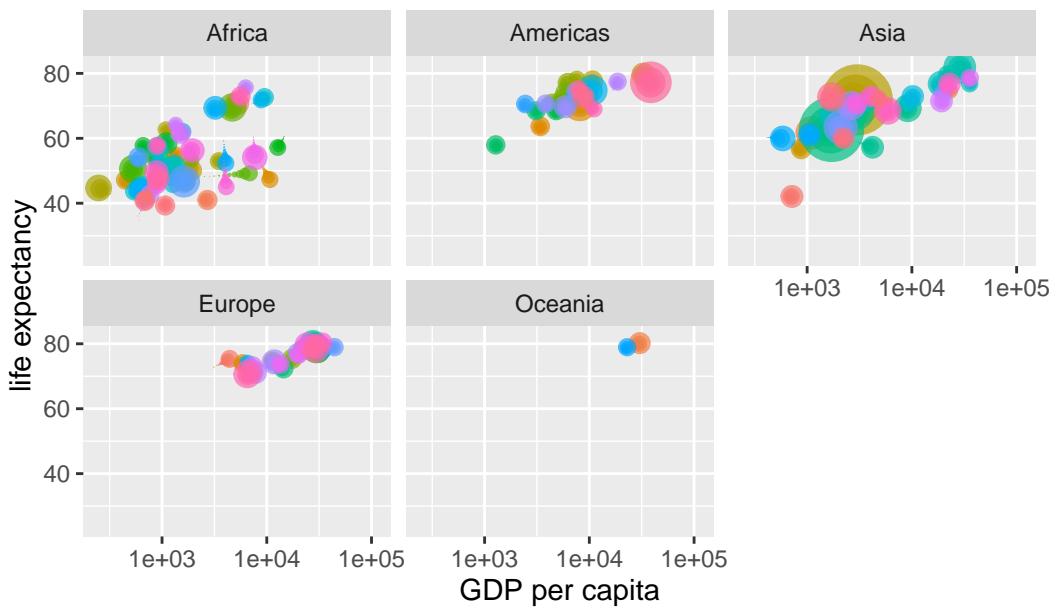
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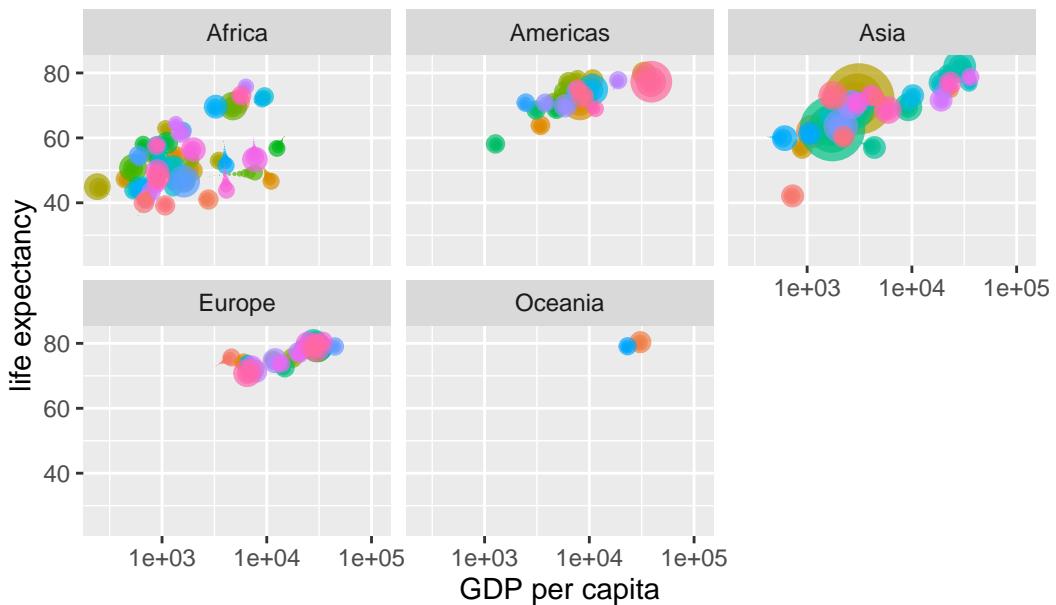
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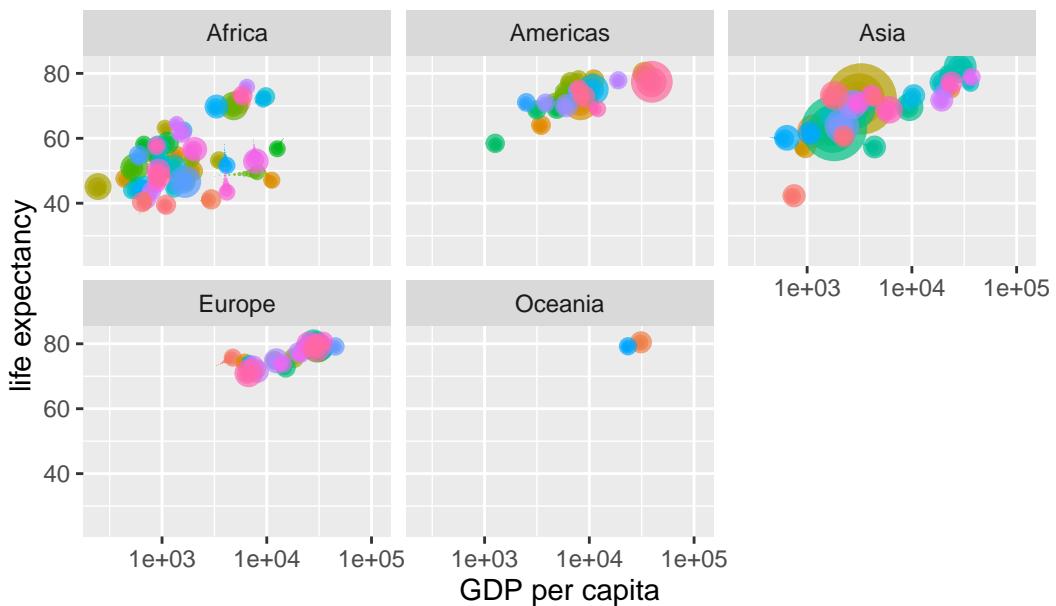
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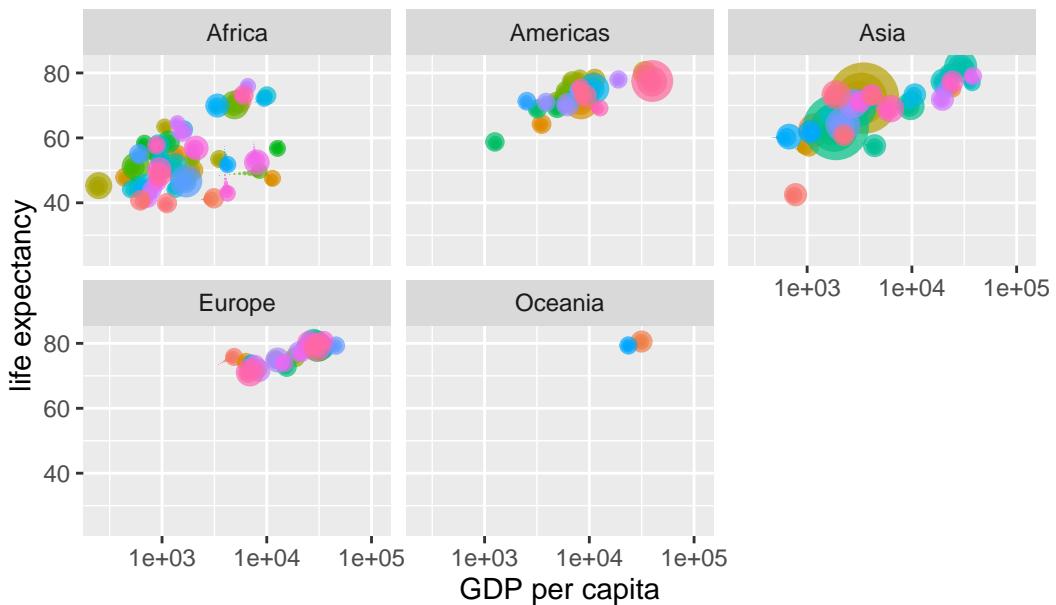
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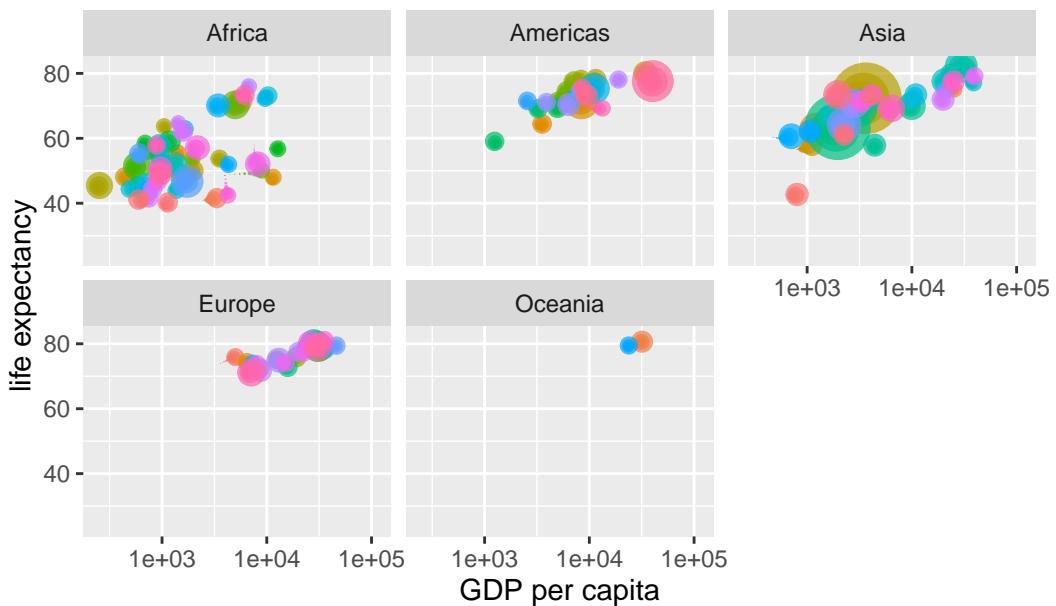
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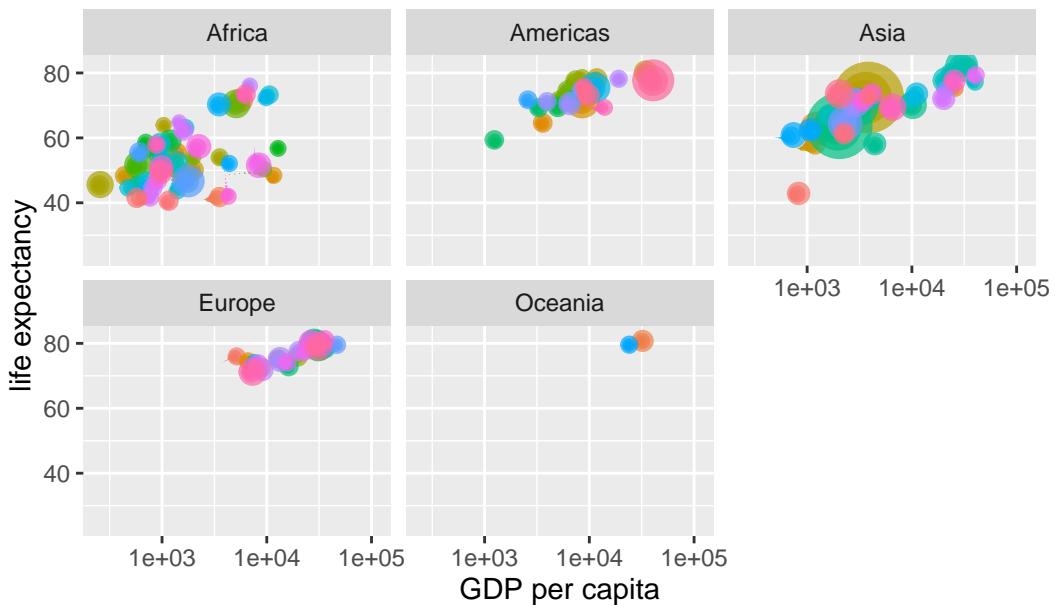
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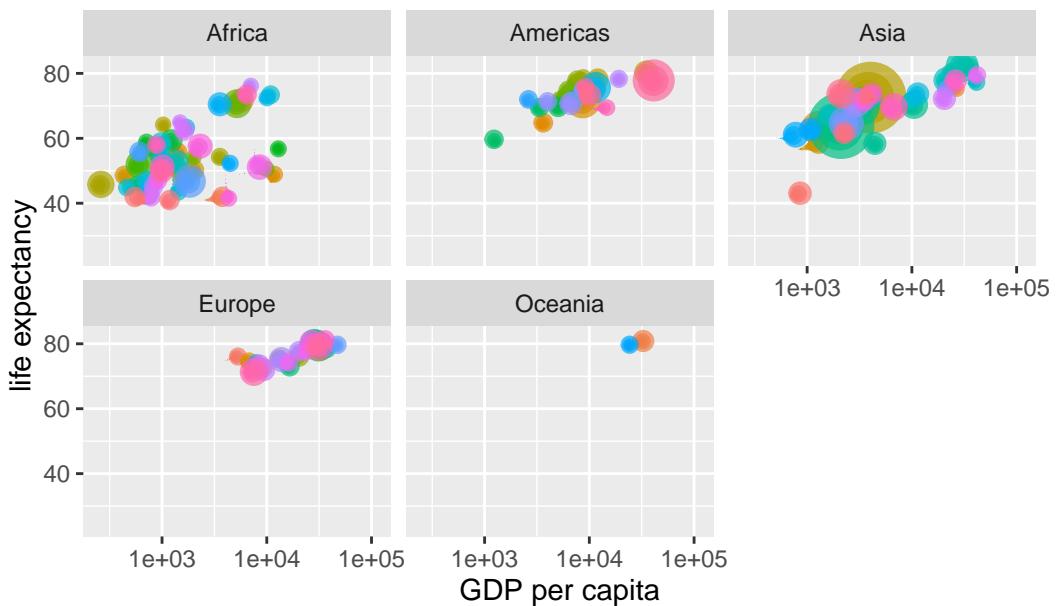
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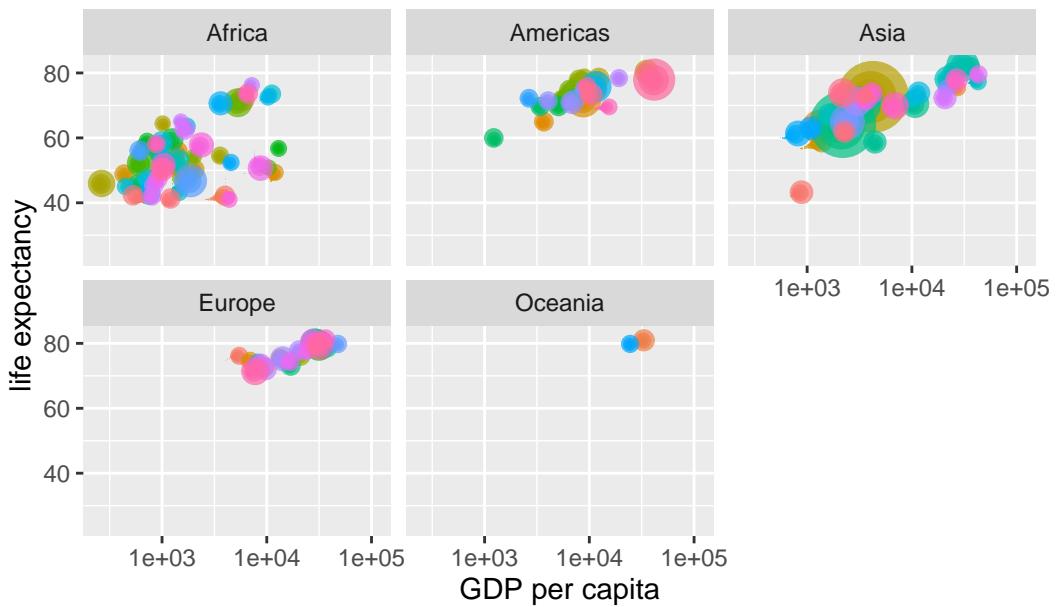
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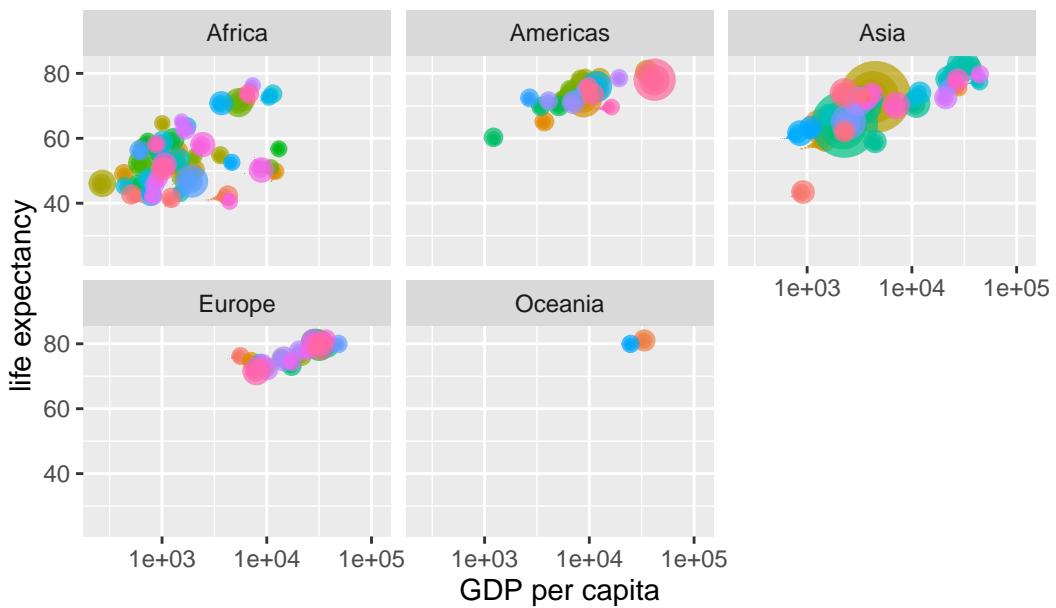
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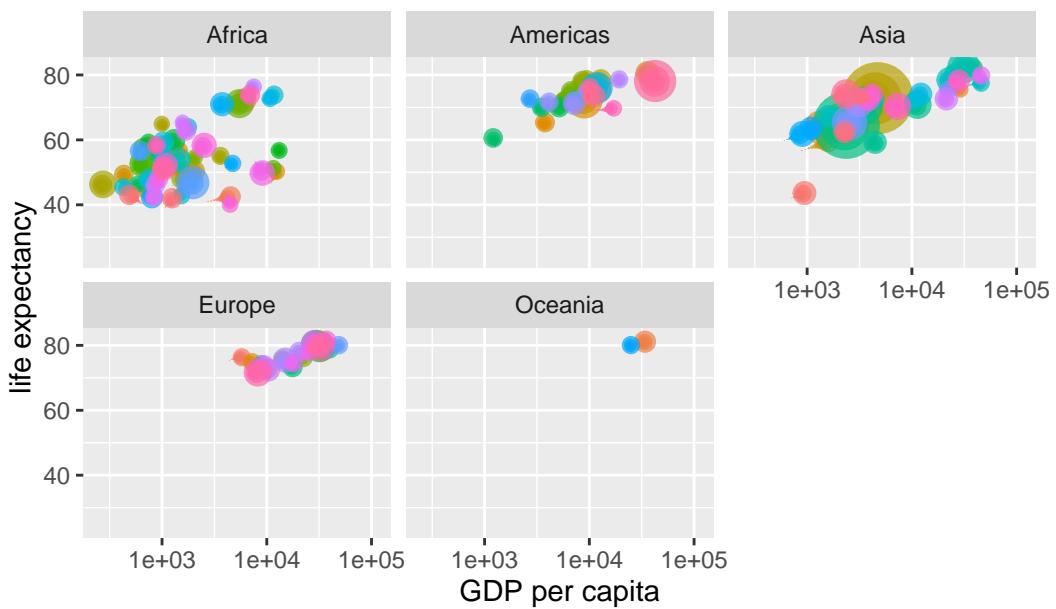
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Year: 2006



Year: 2006



Year: 2007

