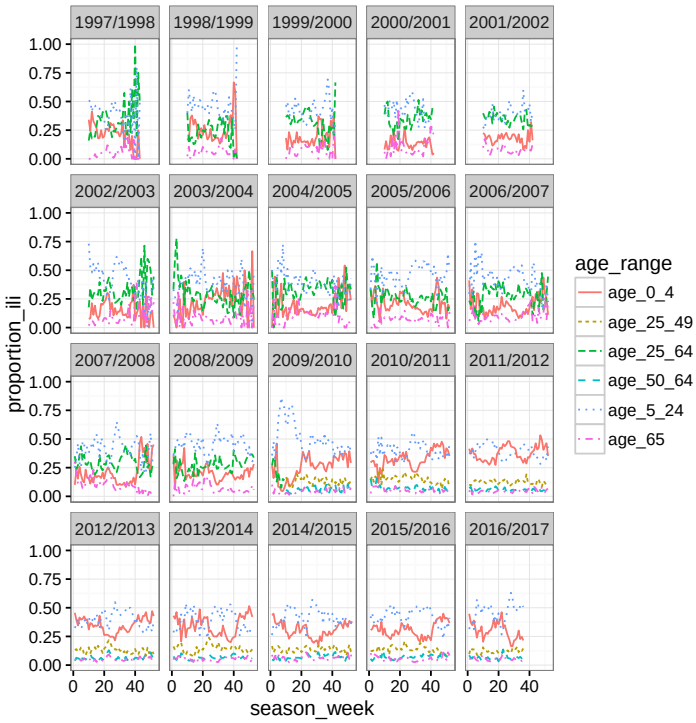
```
> library(dplyr)
> library(tidyr)
> library(lubridate)
> library(ggplot2)
> library(MMWRweek)
> library(cdcfluview)

> regionflu <- get_flu_data("hhs", sub_region=1:10, data_source="ilinet", years=1997:2016)
> usflu <- get_flu_data("national", sub_region=NA, data_source="ilinet", years=1997:2016)
> ## make AGE cols in usflu integer data type
> cols <- matches('^AGE', vars=colnames(usflu))
> usflu[,cols] <- sapply(usflu[,cols], as.integer)
> cols <- matches('^AGE', vars=colnames(regionflu))
> regionflu[,cols] <- sapply(regionflu[,cols], as.integer)
> data <- bind_rows(regionflu, usflu)
> data <- transmute(data,
+   region_type = `REGION TYPE`,
+   region = REGION,
+   year = YEAR,
+   week = WEEK,
+   time = as.POSIXct(MMWRweek2Date(YEAR, WEEK)),
+   weighted_ili = as.numeric(`% WEIGHTED ILI`),
+   unweighted_ili = as.numeric(`%UNWEIGHTED ILI`),
+   age_0_4 = as.integer(`AGE 0-4`),
+   age_5_24 = as.integer(`AGE 5-24`),
+   age_25_49 = as.integer(`AGE 25-49`),
+   age_25_64 = as.integer(`AGE 25-64`),
+   age_50_64 = as.integer(`AGE 50-64`),
+   age_65 = as.integer(`AGE 65`),
+   total_ili = as.integer(ILITOTAL),
+   total_patients = as.integer(`TOTAL PATIENTS`)
+ )
> data$season <- ifelse(
+   data$week <= 30,
+   paste0(data$year - 1, "/", data$year),
+   paste0(data$year, "/", data$year + 1)
+ )
> ## Season week column: week number within season
> ## weeks after week 30 get season_week = week - 30
> ## weeks before week 30 get season_week = week + (number of weeks in previous year) - 30
> ## This computation relies on the start_date function in package MMWRweek,
> ## which is not exported from that package's namespace!!!
> data$season_week <- ifelse(
+   data$week <= 30,
+   data$week + MMWRweek(MMWRweek:::start_date(data$year) - 1)$MMWRweek - 30,
+   data$week - 30
```

```
+ )

> data_age_gathered <- data %>%
+   gather_("age_range",
+     "count",
+     c("age_0_4", "age_5_24", "age_25_49", "age_25_64", "age_50_64", "age_65")) %>%
+   mutate(
+     proportion_ili = count / total_ili,
+     proportion_patients = count / total_patients)
> for(region_val in unique(data_age_gathered$region)) {
+   p <- ggplot(data_age_gathered %>% filter(region == region_val)) +
+     geom_line(aes(x = season_week, y = proportion_ili, colour = age_range, linetype = age_
+     facet_wrap(~ season) +
+     theme_bw()
+   print(p)
+
+   p <- ggplot(data_age_gathered %>% filter(region == region_val)) +
+     geom_line(aes(x = season_week, y = proportion_patients, colour = age_range, linetype =
+     facet_wrap(~ season) +
+     theme_bw()
+   print(p)
+ }
> print(p)
```


1997/1998
1998/1999
1999/2000
2000/2001
2001/2002
2002/2003
2003/2004
2004/2005
2005/2006
2006/2007
2007/2008
2008/2009
2009/2010
2010/2011
2011/2012
2012/2013
2013/2014
2014/2015
2015/2016
2016/2017
proportion_ili
1.00
0.75
0.50
0.25
0.00
0
20
40
season_week
age_range
age_0_4
age_25_49
age_25_64
age_50_64
age_5_24
age_65