Title Placeholder

Load in Specific Packages

```
library(readr)
library(tidyr)
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
```

```
library(here)
```

```
## here() starts at C:/Users/romin/ToyRepo
```

```
library(lemon)
```

```
## Warning: package 'lemon' was built under R version 4.4.2
```

```
library(kableExtra)
```

```
## Warning: package 'kableExtra' was built under R version 4.4.2
```

```
##
## Attaching package: 'kableExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     group_rows
```

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.4.2
```

```
library(reshape())
```

```
## Warning: package 'reshape' was built under R version 4.4.2
```

```
##
## Attaching package: 'reshape'
```

```
## The following object is masked from 'package:dplyr':
##
##     rename
```

```
## The following objects are masked from 'package:tidyr':
##
##     expand, smiths
```

```
library(hexbin)
```

```
## Warning: package 'hexbin' was built under R version 4.4.2
```
```
library(data.table)
```

```
##
## Attaching package: 'data.table'
```

```
## The following object is masked from 'package:reshape':
##
##     melt
```

```
## The following objects are masked from 'package:dplyr':
##
##     between, first, last
```
```
library(GGally)
```

```
## Warning: package 'GGally' was built under R version 4.4.2
```

```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```
```
library(formattable)
```

```
## Warning: package 'formattable' was built under R version 4.4.2
```
```
library(viridis)
```

```
## Warning: package 'viridis' was built under R version 4.4.2
```

```
## Loading required package: viridisLite
```
```
library(TTR)
```

```
## Warning: package 'TTR' was built under R version 4.4.2
```
```
library(zoo)
```

```
## Warning: package 'zoo' was built under R version 4.4.2
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:data.table':
##
##     yearmon, yearqtr
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```
```
library(ggrepel)
```

```
## Warning: package 'ggrepel' was built under R version 4.4.2
```

Load in the data

```
cancerReg <- read.csv("C:\\Users\\romin\\ToyRepo\\Models\\cancerReg.csv")
```

Remove Uncessary Data for Analysis

```r
cancerReg <- cancerReg %>% select(-period,-area_type,-type_definition,-indicator, -upper_confidence_inte
```

Display Summary of All Data

```r
# ggplot(cancerReg,aes(x=year, y= measure, col=area_name)) + geom_line() + geom_point()
# ggplot(cancerReg, aes(x=area_name, y=measure, fill=area_name)) + geom_violin()
# ggparcoord(data= cancerReg, columns = c(), groupColumn = "area_name")
# ggplot(cancerReg, aes(fill=year, y=measure, x=area_name)) + geom_bar(position = "stack", stat = "iden
# ggplot(cancerReg, aes(x = year, y = measure, fill = area_name)) +  geom_area(alpha=0.6 , size=.5, col
#     scale_fill_viridis(discrete = T)
# ggplot(cancerReg, aes(x = year, y = measure, col = area_name)) +
#     geom_point(size = 3, position = position_jitter(h = 0.50, w = 0.50), alpha = 0.5) +
#     geom_smooth(se=FALSE, size = 0.7 )


cancerReg <- cancerReg %>%
    arrange(year) %>%
    mutate(MA = rollmean(cancerReg$measure, k = 14, fill = NA, align = "right"))

subData <- cancerReg[seq(1, nrow(cancerReg), 14), ]
ggplot(cancerReg, aes(x = year)) +
    geom_smooth(aes(y = measure, col = area_name), se = FALSE, size = 0.5, alpha = 0.5) +
    geom_text_repel(data = cancerReg, aes(y = measure, label = area_name), nudge_x = 1, na.rm = TRUE)+
    geom_point(data = subData, aes(y = MA), color = "black", size = 2) +
    geom_line(data = subData, aes(y = MA), colour = "black", linetype = "dashed", size = 0.7) +
    theme(legend.position = "none")
```
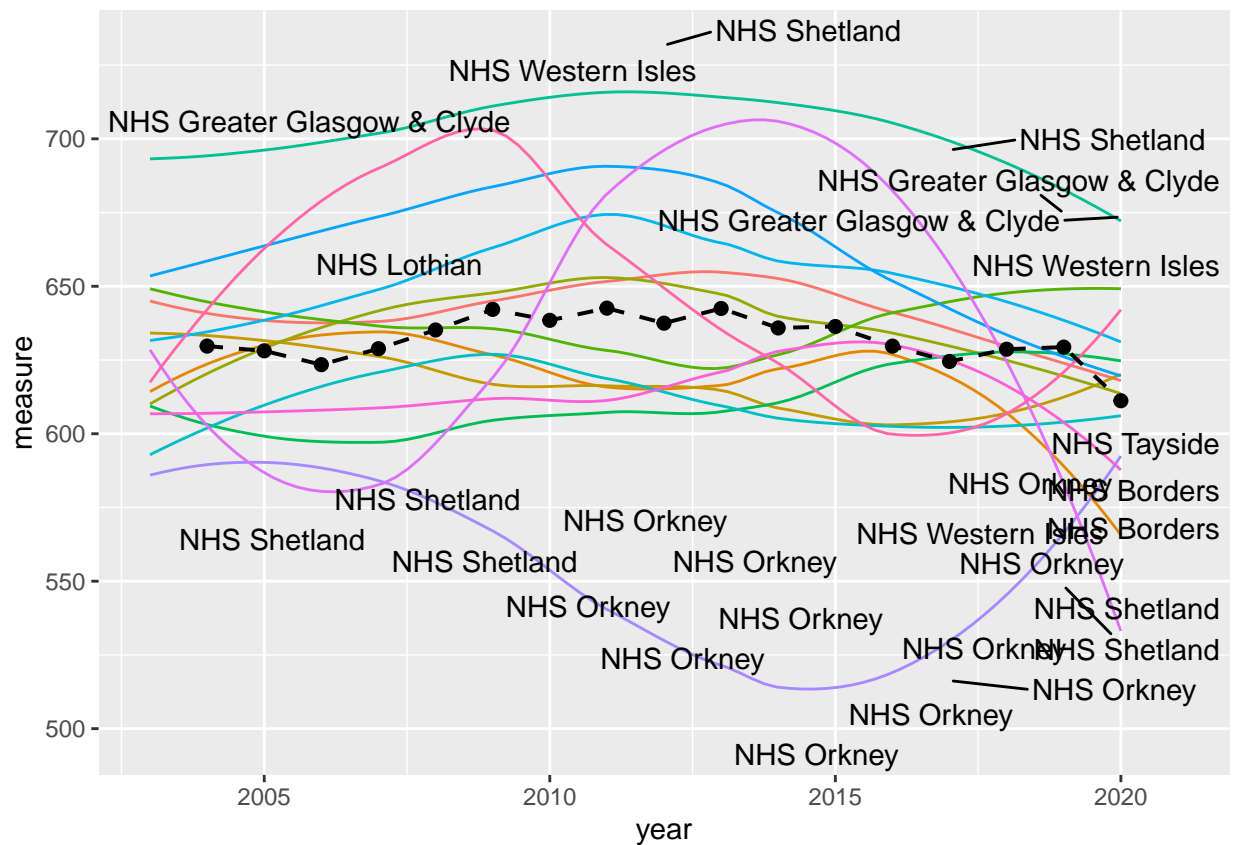
```
## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use `linewidth` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'

## Warning: Removed 1 row containing missing values or values outside the scale range
## (`geom_point()`).

## Warning: Removed 1 row containing missing values or values outside the scale range
## (`geom_line()`).

## Warning: ggrepel: 224 unlabeled data points (too many overlaps). Consider
## increasing max.overlaps
```

```r
colourCells <- function(values, average){
    diffVal <- values - average
    if (diffVal>=0 & diffVal<=20){
        return(paste0("\\cellcolor{green!," ,round(diffVal/100), "}"))
    }
}
```

Summary Table of Data Within Graph

```r
healthBoardData <- cancerReg %>%
    group_by(year) %>%
    mutate(Percent = measure / sum(measure) * 100)
healthBoardData <- cancerReg %>% pivot_wider(names_from = year, values_from = measure)
healthBoardData <- healthBoardData %>%
    mutate(
        Average = rowMeans(select(., `2003`:`2020`), na.rm = TRUE)
    )
kable(healthBoardData, format = "latex", booktabs = TRUE)
```

area_code	area_name	MA	2003	2004	2005	2006	2007	2008	2009	2010
S08000015	NHS Ayrshire & Arran	NA	649.7	NA	NA	NA	NA	NA	NA	NA
S08000016	NHS Borders	NA	614.6	NA	NA	NA	NA	NA	NA	NA
S08000017	NHS Dumfries & Galloway	NA	620.5	NA	NA	NA	NA	NA	NA	NA
S08000019	NHS Forth Valley	NA	651.8	NA	NA	NA	NA	NA	NA	NA
S08000020	NHS Grampian	NA	617.8	NA	NA	NA	NA	NA	NA	NA
S08000022	NHS Highland	NA	602.9	NA	NA	NA	NA	NA	NA	NA
S08000024	NHS Lothian	NA	655.1	NA	NA	NA	NA	NA	NA	NA
S08000025	NHS Orkney	NA	589.0	NA	NA	NA	NA	NA	NA	NA
S08000026	NHS Shetland	NA	616.0	NA	NA	NA	NA	NA	NA	NA
S08000028	NHS Western Isles	NA	652.0	NA	NA	NA	NA	NA	NA	NA
S08000029	NHS Fife	NA	611.4	NA	NA	NA	NA	NA	NA	NA
S08000030	NHS Tayside	NA	611.2	NA	NA	NA	NA	NA	NA	NA
S08000031	NHS Greater Glasgow & Clyde	NA	697.3	NA	NA	NA	NA	NA	NA	NA
S08000032	NHS Lanarkshire	630.2143	633.7	NA	NA	NA	NA	NA	NA	NA
S08000015	NHS Ayrshire & Arran	629.7214	NA	642.8	NA	NA	NA	NA	NA	NA
S08000016	NHS Borders	629.8786	NA	616.8	NA	NA	NA	NA	NA	NA
S08000017	NHS Dumfries & Galloway	631.6429	NA	645.2	NA	NA	NA	NA	NA	NA
S08000019	NHS Forth Valley	631.3857	NA	648.2	NA	NA	NA	NA	NA	NA
S08000020	NHS Grampian	630.2214	NA	601.5	NA	NA	NA	NA	NA	NA
S08000022	NHS Highland	629.6214	NA	594.5	NA	NA	NA	NA	NA	NA
S08000024	NHS Lothian	630.0286	NA	660.8	NA	NA	NA	NA	NA	NA
S08000025	NHS Orkney	629.5571	NA	582.4	NA	NA	NA	NA	NA	NA
S08000026	NHS Shetland	631.0357	NA	636.7	NA	NA	NA	NA	NA	NA
S08000028	NHS Western Isles	629.3286	NA	628.1	NA	NA	NA	NA	NA	NA
S08000029	NHS Fife	629.5143	NA	614.0	NA	NA	NA	NA	NA	NA
S08000030	NHS Tayside	629.2357	NA	607.3	NA	NA	NA	NA	NA	NA
S08000031	NHS Greater Glasgow & Clyde	628.9929	NA	693.9	NA	NA	NA	NA	NA	NA
S08000032	NHS Lanarkshire	628.9214	NA	632.7	NA	NA	NA	NA	NA	NA
S08000015	NHS Ayrshire & Arran	628.1214	NA	NA	631.6	NA	NA	NA	NA	NA
S08000016	NHS Borders	629.2571	NA	NA	632.7	NA	NA	NA	NA	NA
S08000017	NHS Dumfries & Galloway	628.8429	NA	NA	639.4	NA	NA	NA	NA	NA
S08000019	NHS Forth Valley	628.4571	NA	NA	642.8	NA	NA	NA	NA	NA
S08000020	NHS Grampian	627.6143	NA	NA	589.7	NA	NA	NA	NA	NA
S08000022	NHS Highland	627.9286	NA	NA	598.9	NA	NA	NA	NA	NA
S08000024	NHS Lothian	627.8286	NA	NA	659.4	NA	NA	NA	NA	NA
S08000025	NHS Orkney	628.1643	NA	NA	587.1	NA	NA	NA	NA	NA
S08000026	NHS Shetland	623.5286	NA	NA	571.8	NA	NA	NA	NA	NA
S08000028	NHS Western Isles	622.2571	NA	NA	610.3	NA	NA	NA	NA	NA
S08000029	NHS Fife	623.4500	NA	NA	630.7	NA	NA	NA	NA	NA
S08000030	NHS Tayside	622.9714	NA	NA	600.6	NA	NA	NA	NA	NA
S08000031	NHS Greater Glasgow & Clyde	623.0500	NA	NA	695.0	NA	NA	NA	NA	NA
S08000032	NHS Lanarkshire	623.8214	NA	NA	643.5	NA	NA	NA	NA	NA
S08000015	NHS Ayrshire & Arran	623.4286	NA	NA	NA	626.1	NA	NA	NA	NA
S08000016	NHS Borders	624.0571	NA	NA	NA	641.5	NA	NA	NA	NA
S08000017	NHS Dumfries & Galloway	624.2500	NA	NA	NA	642.1	NA	NA	NA	NA
S08000019	NHS Forth Valley	622.5000	NA	NA	NA	618.3	NA	NA	NA	NA
S08000020	NHS Grampian	622.2786	NA	NA	NA	586.6	NA	NA	NA	NA
S08000022	NHS Highland	623.3071	NA	NA	NA	613.3	NA	NA	NA	NA
S08000024	NHS Lothian	623.7857	NA	NA	NA	666.1	NA	NA	NA	NA
S08000025	NHS Orkney	624.5714	NA	NA	NA	598.1	NA	NA	NA	NA
S08000026	NHS Shetland	624.7500	NA	NA	NA	574.3	NA	NA	NA	NA
S08000028	NHS Western Isles	628.6143	NA	NA	NA	664.4	NA	NA	NA	NA
S08000029	NHS Fife	629.4000	NA	NA	NA	641.7	NA	NA	NA	NA
S08000030	NHS Tayside	629.0714	NA	NA	NA	596.0	NA	NA	NA	NA
S08000031	NHS Greater Glasgow & Clyde	628.5429	NA	NA	NA	687.6	NA	NA	NA	NA

```
healthBoardData
```

```
## # A tibble: 252 x 22
##    area_code area_name      MA `2003` `2004` `2005` `2006` `2007` `2008` `2009`
##    <chr>     <chr>       <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
##  1 S08000015 NHS Ayrshir~   NA   650.     NA     NA     NA     NA     NA     NA
##  2 S08000016 NHS Borders    NA   615.     NA     NA     NA     NA     NA     NA
##  3 S08000017 NHS Dumfrie~   NA   620.     NA     NA     NA     NA     NA     NA
##  4 S08000019 NHS Forth V~   NA   652.     NA     NA     NA     NA     NA     NA
##  5 S08000020 NHS Grampian   NA   618.     NA     NA     NA     NA     NA     NA
##  6 S08000022 NHS Highland   NA   603.     NA     NA     NA     NA     NA     NA
##  7 S08000024 NHS Lothian    NA   655.     NA     NA     NA     NA     NA     NA
##  8 S08000025 NHS Orkney     NA   589      NA     NA     NA     NA     NA     NA
##  9 S08000026 NHS Shetland   NA   616      NA     NA     NA     NA     NA     NA
## 10 S08000028 NHS Western~   NA   652      NA     NA     NA     NA     NA     NA
## # i 242 more rows
## # i 12 more variables: `2010` <dbl>, `2011` <dbl>, `2012` <dbl>, `2013` <dbl>,
## #   `2014` <dbl>, `2015` <dbl>, `2016` <dbl>, `2017` <dbl>, `2018` <dbl>,
## #   `2019` <dbl>, `2020` <dbl>, Average <dbl>
```

#Note for next time: what I want to do at this point is to show the changing colours as a difference change if its only within a small amount of chaning values then ignore the calues and do not #colour the cell, otherwise red fir a rise and green for a fall