Title Placeholder

Load in Specific Packages

```r
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
```

```r
library(here)
```

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

```r
library(lemon)
```

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

```r
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
```

```r
library(ggplot2)
```

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

```r
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
```

```r
library(hexbin)
```

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

```r
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
```

```r
library(GGally)
```

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

```
## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```

```r
library(formattable)
```

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

```r
library(viridis)
```

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

```
## Loading required package: viridisLite
```

Load in the data

```r
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_int
cancerReg
```

```
##      area_code                area_name year measure
## 1    S08000015     NHS Ayrshire & Arran 2003   649.7
## 2    S08000016              NHS Borders 2003   614.6
## 3    S08000017  NHS Dumfries & Galloway 2003   620.5
## 4    S08000019         NHS Forth Valley 2003   651.8
## 5    S08000020             NHS Grampian 2003   617.8
## 6    S08000022             NHS Highland 2003   602.9
## 7    S08000024              NHS Lothian 2003   655.1
## 8    S08000025               NHS Orkney 2003   589.0
## 9    S08000026             NHS Shetland 2003   616.0
## 10   S08000028         NHS Western Isles 2003  652.0
## 11   S08000029                 NHS Fife 2003   611.4
## 12   S08000030              NHS Tayside 2003   611.2
## 13   S08000031 NHS Greater Glasgow & Clyde 2003 697.3
```

```
## 14 S08000032               NHS Lanarkshire 2003    633.7
## 15 S08000015     NHS Ayrshire & Arran 2004          642.8
## 16 S08000016                  NHS Borders 2004       616.8
## 17 S08000017 NHS Dumfries & Galloway 2004           645.2
## 18 S08000019           NHS Forth Valley 2004         648.2
## 19 S08000020               NHS Grampian 2004         601.5
## 20 S08000022               NHS Highland 2004         594.5
## 21 S08000024                NHS Lothian 2004         660.8
## 22 S08000025                 NHS Orkney 2004         582.4
## 23 S08000026               NHS Shetland 2004         636.7
## 24 S08000028          NHS Western Isles 2004         628.1
## 25 S08000029                   NHS Fife 2004         614.0
## 26 S08000030                NHS Tayside 2004         607.3
## 27 S08000031 NHS Greater Glasgow & Clyde 2004       693.9
## 28 S08000032             NHS Lanarkshire 2004        632.7
## 29 S08000015     NHS Ayrshire & Arran 2005          631.6
## 30 S08000016                  NHS Borders 2005       632.7
## 31 S08000017 NHS Dumfries & Galloway 2005           639.4
## 32 S08000019           NHS Forth Valley 2005         642.8
## 33 S08000020               NHS Grampian 2005         589.7
## 34 S08000022               NHS Highland 2005         598.9
## 35 S08000024                NHS Lothian 2005         659.4
## 36 S08000025                 NHS Orkney 2005         587.1
## 37 S08000026               NHS Shetland 2005         571.8
## 38 S08000028          NHS Western Isles 2005         610.3
## 39 S08000029                   NHS Fife 2005         630.7
## 40 S08000030                NHS Tayside 2005         600.6
## 41 S08000031 NHS Greater Glasgow & Clyde 2005       695.0
## 42 S08000032             NHS Lanarkshire 2005        643.5
## 43 S08000015     NHS Ayrshire & Arran 2006          626.1
## 44 S08000016                  NHS Borders 2006       641.5
## 45 S08000017 NHS Dumfries & Galloway 2006           642.1
## 46 S08000019           NHS Forth Valley 2006         618.3
## 47 S08000020               NHS Grampian 2006         586.6
## 48 S08000022               NHS Highland 2006         613.3
## 49 S08000024                NHS Lothian 2006         666.1
## 50 S08000025                 NHS Orkney 2006         598.1
## 51 S08000026               NHS Shetland 2006         574.3
## 52 S08000028          NHS Western Isles 2006         664.4
## 53 S08000029                   NHS Fife 2006         641.7
## 54 S08000030                NHS Tayside 2006         596.0
## 55 S08000031 NHS Greater Glasgow & Clyde 2006       687.6
## 56 S08000032             NHS Lanarkshire 2006        637.3
## 57 S08000015     NHS Ayrshire & Arran 2007          636.4
## 58 S08000016                  NHS Borders 2007       643.5
## 59 S08000017 NHS Dumfries & Galloway 2007           613.4
## 60 S08000019           NHS Forth Valley 2007         633.2
## 61 S08000020               NHS Grampian 2007         595.9
## 62 S08000022               NHS Highland 2007         627.4
## 63 S08000024                NHS Lothian 2007         668.7
## 64 S08000025                 NHS Orkney 2007         587.4
## 65 S08000026               NHS Shetland 2007         562.6
## 66 S08000028          NHS Western Isles 2007         707.2
## 67 S08000029                   NHS Fife 2007         648.9
```

```
## 68  S08000030                    NHS Tayside 2007   617.6
## 69  S08000031 NHS Greater Glasgow & Clyde 2007   698.1
## 70  S08000032               NHS Lanarkshire 2007   640.5
## 71  S08000015          NHS Ayrshire & Arran 2008   648.2
## 72  S08000016                    NHS Borders 2008   627.5
## 73  S08000017      NHS Dumfries & Galloway 2008   619.8
## 74  S08000019               NHS Forth Valley 2008   638.9
## 75  S08000020                   NHS Grampian 2008   605.0
## 76  S08000022                   NHS Highland 2008   627.6
## 77  S08000024                    NHS Lothian 2008   683.4
## 78  S08000025                     NHS Orkney 2008   589.3
## 79  S08000026                   NHS Shetland 2008   594.9
## 80  S08000028              NHS Western Isles 2008   726.0
## 81  S08000029                        NHS Fife 2008   643.9
## 82  S08000030                    NHS Tayside 2008   621.1
## 83  S08000031 NHS Greater Glasgow & Clyde 2008   710.9
## 84  S08000032               NHS Lanarkshire 2008   649.8
## 85  S08000015          NHS Ayrshire & Arran 2009   652.2
## 86  S08000016                    NHS Borders 2009   633.8
## 87  S08000017      NHS Dumfries & Galloway 2009   609.1
## 88  S08000019               NHS Forth Valley 2009   649.8
## 89  S08000020                   NHS Grampian 2009   605.4
## 90  S08000022                   NHS Highland 2009   625.8
## 91  S08000024                    NHS Lothian 2009   681.6
## 92  S08000025                     NHS Orkney 2009   543.0
## 93  S08000026                   NHS Shetland 2009   596.0
## 94  S08000028              NHS Western Isles 2009   715.0
## 95  S08000029                        NHS Fife 2009   640.4
## 96  S08000030                    NHS Tayside 2009   613.7
## 97  S08000031 NHS Greater Glasgow & Clyde 2009   715.4
## 98  S08000032               NHS Lanarkshire 2009   665.6
## 99  S08000015          NHS Ayrshire & Arran 2010   643.8
## 100 S08000016                    NHS Borders 2010   614.8
## 101 S08000017      NHS Dumfries & Galloway 2010   628.9
## 102 S08000019               NHS Forth Valley 2010   634.1
## 103 S08000020                   NHS Grampian 2010   608.5
## 104 S08000022                   NHS Highland 2010   625.4
## 105 S08000024                    NHS Lothian 2010   691.8
## 106 S08000025                     NHS Orkney 2010   569.2
## 107 S08000026                   NHS Shetland 2010   663.4
## 108 S08000028              NHS Western Isles 2010   674.4
## 109 S08000029                        NHS Fife 2010   650.0
## 110 S08000030                    NHS Tayside 2010   603.1
## 111 S08000031 NHS Greater Glasgow & Clyde 2010   714.4
## 112 S08000032               NHS Lanarkshire 2010   675.0
## 113 S08000015          NHS Ayrshire & Arran 2011   643.2
## 114 S08000016                    NHS Borders 2011   614.5
## 115 S08000017      NHS Dumfries & Galloway 2011   617.6
## 116 S08000019               NHS Forth Valley 2011   620.3
## 117 S08000020                   NHS Grampian 2011   606.2
## 118 S08000022                   NHS Highland 2011   616.8
## 119 S08000024                    NHS Lothian 2011   684.3
## 120 S08000025                     NHS Orkney 2011   531.3
## 121 S08000026                   NHS Shetland 2011   685.6
```

```
## 122 S08000028         NHS Western Isles 2011  646.0
## 123 S08000029                   NHS Fife 2011  651.3
## 124 S08000030                NHS Tayside 2011  606.9
## 125 S08000031 NHS Greater Glasgow & Clyde 2011  712.3
## 126 S08000032            NHS Lanarkshire 2011  677.5
## 127 S08000015        NHS Ayrshire & Arran 2012  654.3
## 128 S08000016                NHS Borders 2012  608.5
## 129 S08000017    NHS Dumfries & Galloway 2012  602.7
## 130 S08000019            NHS Forth Valley 2012  617.3
## 131 S08000020                NHS Grampian 2012  606.8
## 132 S08000022                NHS Highland 2012  614.3
## 133 S08000024                 NHS Lothian 2012  691.6
## 134 S08000025                  NHS Orkney 2012  549.1
## 135 S08000026                NHS Shetland 2012  731.7
## 136 S08000028         NHS Western Isles 2012  651.6
## 137 S08000029                   NHS Fife 2012  659.4
## 138 S08000030                NHS Tayside 2012  616.1
## 139 S08000031 NHS Greater Glasgow & Clyde 2012  713.3
## 140 S08000032            NHS Lanarkshire 2012  672.7
## 141 S08000015        NHS Ayrshire & Arran 2013  659.6
## 142 S08000016                NHS Borders 2013  621.2
## 143 S08000017    NHS Dumfries & Galloway 2013  619.9
## 144 S08000019            NHS Forth Valley 2013  626.7
## 145 S08000020                NHS Grampian 2013  607.1
## 146 S08000022                NHS Highland 2013  604.8
## 147 S08000024                 NHS Lothian 2013  686.7
## 148 S08000025                  NHS Orkney 2013  496.1
## 149 S08000026                NHS Shetland 2013  689.3
## 150 S08000028         NHS Western Isles 2013  626.6
## 151 S08000029                   NHS Fife 2013  654.5
## 152 S08000030                NHS Tayside 2013  622.6
## 153 S08000031 NHS Greater Glasgow & Clyde 2013  718.2
## 154 S08000032            NHS Lanarkshire 2013  666.5
## 155 S08000015        NHS Ayrshire & Arran 2014  662.1
## 156 S08000016                NHS Borders 2014  625.5
## 157 S08000017    NHS Dumfries & Galloway 2014  616.1
## 158 S08000019            NHS Forth Valley 2014  630.4
## 159 S08000020                NHS Grampian 2014  610.3
## 160 S08000022                NHS Highland 2014  612.2
## 161 S08000024                 NHS Lothian 2014  684.5
## 162 S08000025                  NHS Orkney 2014  529.1
## 163 S08000026                NHS Shetland 2014  683.1
## 164 S08000028         NHS Western Isles 2014  641.8
## 165 S08000029                   NHS Fife 2014  638.3
## 166 S08000030                NHS Tayside 2014  627.8
## 167 S08000031 NHS Greater Glasgow & Clyde 2014  712.0
## 168 S08000032            NHS Lanarkshire 2014  654.8
## 169 S08000015        NHS Ayrshire & Arran 2015  643.4
## 170 S08000016                NHS Borders 2015  618.9
## 171 S08000017    NHS Dumfries & Galloway 2015  617.9
## 172 S08000019            NHS Forth Valley 2015  628.9
## 173 S08000020                NHS Grampian 2015  617.1
## 174 S08000022                NHS Highland 2015  602.4
## 175 S08000024                 NHS Lothian 2015  659.9
```

```
## 176 S08000025               NHS Orkney 2015    508.0
## 177 S08000026              NHS Shetland 2015    693.4
## 178 S08000028         NHS Western Isles 2015    614.6
## 179 S08000029                  NHS Fife 2015    628.3
## 180 S08000030               NHS Tayside 2015    632.1
## 181 S08000031 NHS Greater Glasgow & Clyde 2015  711.5
## 182 S08000032            NHS Lanarkshire 2015    649.1
## 183 S08000015        NHS Ayrshire & Arran 2016   633.9
## 184 S08000016               NHS Borders 2016    628.1
## 185 S08000017    NHS Dumfries & Galloway 2016    580.9
## 186 S08000019          NHS Forth Valley 2016    638.2
## 187 S08000020               NHS Grampian 2016    614.8
## 188 S08000022               NHS Highland 2016    597.5
## 189 S08000024                NHS Lothian 2016    641.4
## 190 S08000025                 NHS Orkney 2016    521.7
## 191 S08000026               NHS Shetland 2016    697.4
## 192 S08000028          NHS Western Isles 2016    598.1
## 193 S08000029                   NHS Fife 2016    617.1
## 194 S08000030                NHS Tayside 2016    631.2
## 195 S08000031 NHS Greater Glasgow & Clyde 2016  699.3
## 196 S08000032            NHS Lanarkshire 2016    650.3
## 197 S08000015        NHS Ayrshire & Arran 2017   627.2
## 198 S08000016               NHS Borders 2017    638.1
## 199 S08000017    NHS Dumfries & Galloway 2017    588.7
## 200 S08000019          NHS Forth Valley 2017    657.4
## 201 S08000020               NHS Grampian 2017    637.4
## 202 S08000022               NHS Highland 2017    598.8
## 203 S08000024                NHS Lothian 2017    632.7
## 204 S08000025                 NHS Orkney 2017    516.3
## 205 S08000026               NHS Shetland 2017    696.2
## 206 S08000028          NHS Western Isles 2017    573.3
## 207 S08000029                   NHS Fife 2017    637.5
## 208 S08000030                NHS Tayside 2017    632.1
## 209 S08000031 NHS Greater Glasgow & Clyde 2017  700.2
## 210 S08000032            NHS Lanarkshire 2017    659.8
## 211 S08000015        NHS Ayrshire & Arran 2018   632.8
## 212 S08000016               NHS Borders 2018    629.3
## 213 S08000017    NHS Dumfries & Galloway 2018    618.5
## 214 S08000019          NHS Forth Valley 2018    664.7
## 215 S08000020               NHS Grampian 2018    651.1
## 216 S08000022               NHS Highland 2018    613.4
## 217 S08000024                NHS Lothian 2018    635.3
## 218 S08000025                 NHS Orkney 2018    550.7
## 219 S08000026               NHS Shetland 2018    610.8
## 220 S08000028          NHS Western Isles 2018    588.7
## 221 S08000029                   NHS Fife 2018    645.9
## 222 S08000030                NHS Tayside 2018    623.9
## 223 S08000031 NHS Greater Glasgow & Clyde 2018  702.0
## 224 S08000032            NHS Lanarkshire 2018    661.0
## 225 S08000015        NHS Ayrshire & Arran 2019   616.0
## 226 S08000016               NHS Borders 2019    575.6
## 227 S08000017    NHS Dumfries & Galloway 2019    611.7
## 228 S08000019          NHS Forth Valley 2019    643.7
## 229 S08000020               NHS Grampian 2019    623.3
```

```
## 230 S08000022               NHS Highland 2019   600.8
## 231 S08000024                NHS Lothian 2019   617.5
## 232 S08000025                NHS Orkney 2019   575.9
## 233 S08000026               NHS Shetland 2019   548.4
## 234 S08000028           NHS Western Isles 2019   609.0
## 235 S08000029                   NHS Fife 2019   623.1
## 236 S08000030                NHS Tayside 2019   592.0
## 237 S08000031 NHS Greater Glasgow & Clyde 2019   674.8
## 238 S08000032            NHS Lanarkshire 2019   635.4
## 239 S08000015         NHS Ayrshire & Arran 2020   625.5
## 240 S08000016                NHS Borders 2020   560.1
## 241 S08000017    NHS Dumfries & Galloway 2020   621.7
## 242 S08000019            NHS Forth Valley 2020   642.4
## 243 S08000020               NHS Grampian 2020   614.9
## 244 S08000022               NHS Highland 2020   604.9
## 245 S08000024                NHS Lothian 2020   628.9
## 246 S08000025                NHS Orkney 2020   586.6
## 247 S08000026               NHS Shetland 2020   551.9
## 248 S08000028           NHS Western Isles 2020   665.8
## 249 S08000029                   NHS Fife 2020   602.0
## 250 S08000030                NHS Tayside 2020   590.5
## 251 S08000031 NHS Greater Glasgow & Clyde 2020   673.5
## 252 S08000032            NHS Lanarkshire 2020   624.1
## 253 S08000015         NHS Ayrshire & Arran 2021     NA
## 254 S08000016                NHS Borders 2021     NA
## 255 S08000017    NHS Dumfries & Galloway 2021     NA
## 256 S08000019            NHS Forth Valley 2021     NA
## 257 S08000020               NHS Grampian 2021     NA
## 258 S08000022               NHS Highland 2021     NA
## 259 S08000024                NHS Lothian 2021     NA
## 260 S08000025                NHS Orkney 2021     NA
## 261 S08000026               NHS Shetland 2021     NA
## 262 S08000028           NHS Western Isles 2021     NA
## 263 S08000029                   NHS Fife 2021     NA
## 264 S08000030                NHS Tayside 2021     NA
## 265 S08000031 NHS Greater Glasgow & Clyde 2021     NA
## 266 S08000032            NHS Lanarkshire 2021     NA
```
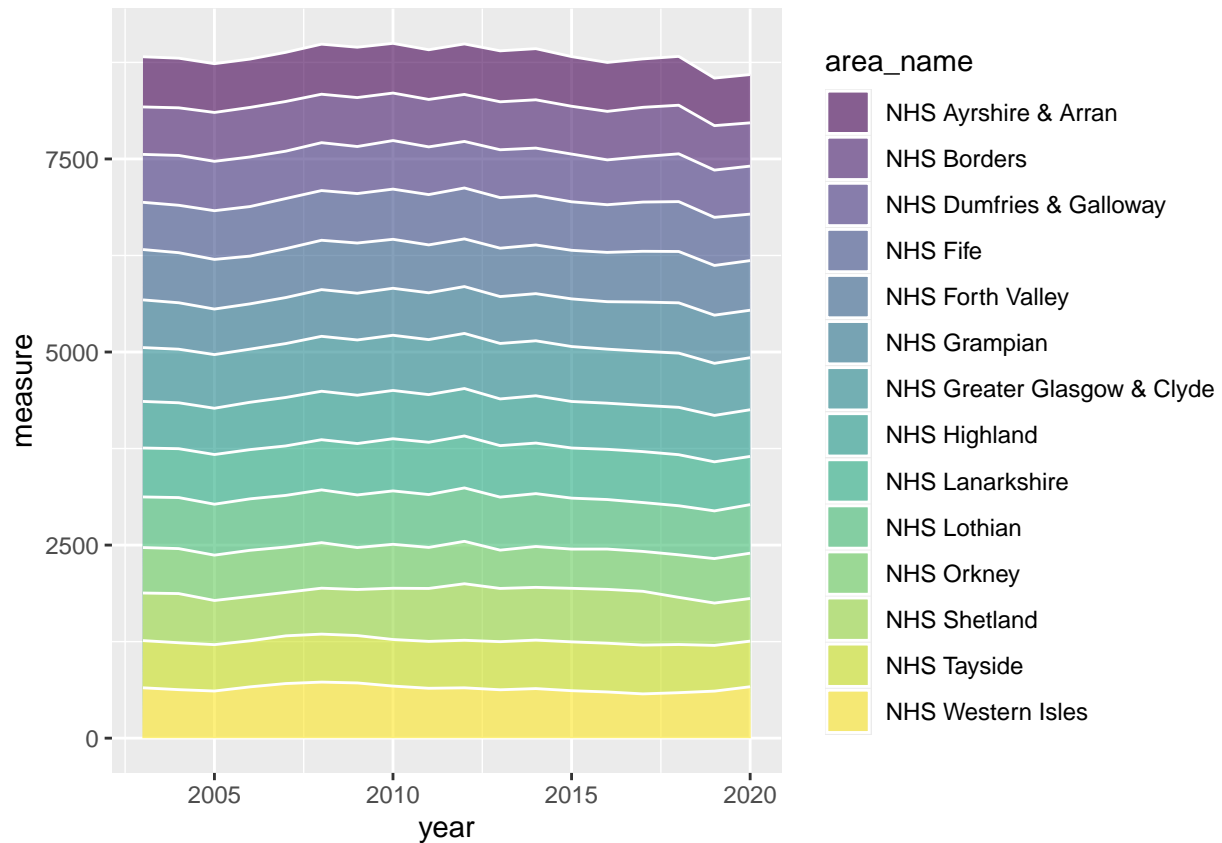
Display Summary of All Data

```
# 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, colou
    scale_fill_viridis(discrete = T)
```

```
## 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.
```

```
## Warning: Removed 14 rows containing non-finite outside the scale range
## (`stat_align()`).
```

```r
colorRampPalette(c(rgb(1,0,0,0), rgb(0,0,1,0)), alpha = TRUE)(8)
```

```
## [1] "#FF000000" "#DA002400" "#B6004800" "#91006D00" "#6D009100" "#4800B600"
## [7] "#2400DA00" "#0000FF00"
```

```r
diffOverYears <- function(year1, year2){
    result = year1 - year2
    if (result >=0 & result<=50){
        result="white"
    }else if (result<0){

    }

    }
```

Summary Table of Data Within Graph

```r
customGreen0 = "#DeF7E9"


customGreen = "#71CA97"


customRed = "#ff7f7f"
# colnames(healthBoardData)
# healthBoardData <- healthBoardData %>%
#     mutate(
#         Average = round(rowMeans(select(., starts_with("measure.")), na.rm = TRUE), 2),
```

```r
#      )
### This one works for creating some weird random diff
# healthBoardData <- reshape(cancerReg, idvar = "area_name", timevar = "year", v.names = "measure", dir

# healthBoardData <- cancerReg %>%
#     arrange(area_name, year) %>%
#     group_by(area_name) %>%
#     mutate(measure_diff = c(NA, diff(measure)))
# healthBoardData
# Difference = across(`2003`:`2020`, ~ . - lag(.))
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)
    )


healthBoardData
```

```
## # A tibble: 14 x 22
##    area_code area_name    `2003` `2004` `2005` `2006` `2007` `2008` `2009` `2010`
##    <chr>     <chr>         <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
##  1 S08000015 NHS Ayrshi~    650.   643.   632.   626.   636.   648.   652.   644.
##  2 S08000016 NHS Borders    615.   617.   633.   642.   644.   628.   634.   615.
##  3 S08000017 NHS Dumfri~    620.   645.   639.   642.   613.   620.   609.   629.
##  4 S08000019 NHS Forth ~    652.   648.   643.   618.   633.   639.   650.   634.
##  5 S08000020 NHS Grampi~    618.   602.   590.   587.   596.   605    605.   608.
##  6 S08000022 NHS Highla~    603.   594.   599.   613.   627.   628.   626.   625.
##  7 S08000024 NHS Lothian    655.   661.   659.   666.   669.   683.   682.   692.
##  8 S08000025 NHS Orkney     589    582.   587.   598.   587.   589.   543    569.
##  9 S08000026 NHS Shetla~    616    637.   572.   574.   563.   595.   596    663.
## 10 S08000028 NHS Wester~    652    628.   610.   664.   707.   726    715    674.
## 11 S08000029 NHS Fife       611.   614    631.   642.   649.   644.   640.   650
## 12 S08000030 NHS Tayside    611.   607.   601.   596    618.   621.   614.   603.
## 13 S08000031 NHS Greate~    697.   694.   695    688.   698.   711.   715.   714.
## 14 S08000032 NHS Lanark~    634.   633.   644.   637.   640.   650.   666.   675
## # i 12 more variables: `2011` <dbl>, `2012` <dbl>, `2013` <dbl>, `2014` <dbl>,
## #   `2015` <dbl>, `2016` <dbl>, `2017` <dbl>, `2018` <dbl>, `2019` <dbl>,
## #   `2020` <dbl>, `2021` <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