

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)
library(kableExtra)
```

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

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

```
library(ggplot2)
library(reshape())
```

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

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

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

```
library(hexbin)
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)

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

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

##
## 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)
library(grid)
```

Load in the data

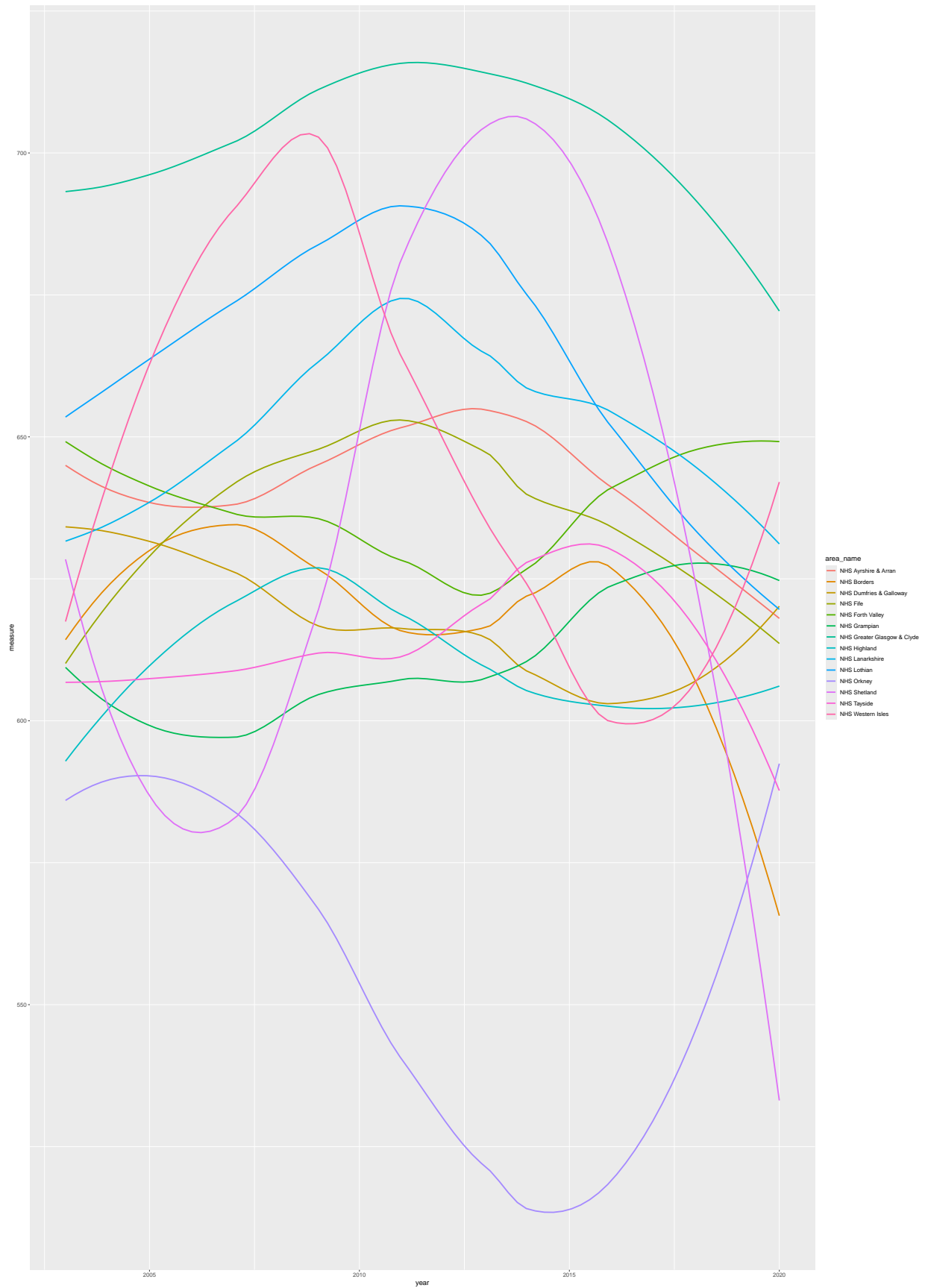
```
cancerReg <- read.csv("C:\\Users\\romin\\ToyRepo\\Models\\cancerReg.csv")
```

Remove Unnecessary Data for Analysis

```
cancerReg <- cancerReg %>% select(-period, -area_type, -type_definition, -indicator, -upper_confidence_int)
```

Display All Data Points

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



Find Average of All Measures by Year

```
avgYearly <- cancerReg %>%
  group_by(year) %>%
  mutate(AvgYear = mean(measure, na.rm = TRUE)) %>%
  select(-area_name, -measure, -area_code)
```

Calculate Moving Average for Each Health Board

```
movingAvg <- cancerReg %>%
  group_by(area_name) %>%
  arrange(year) %>%
  mutate(MA = cumsum(measure) / row_number())
```

Find Last Data Points for Data

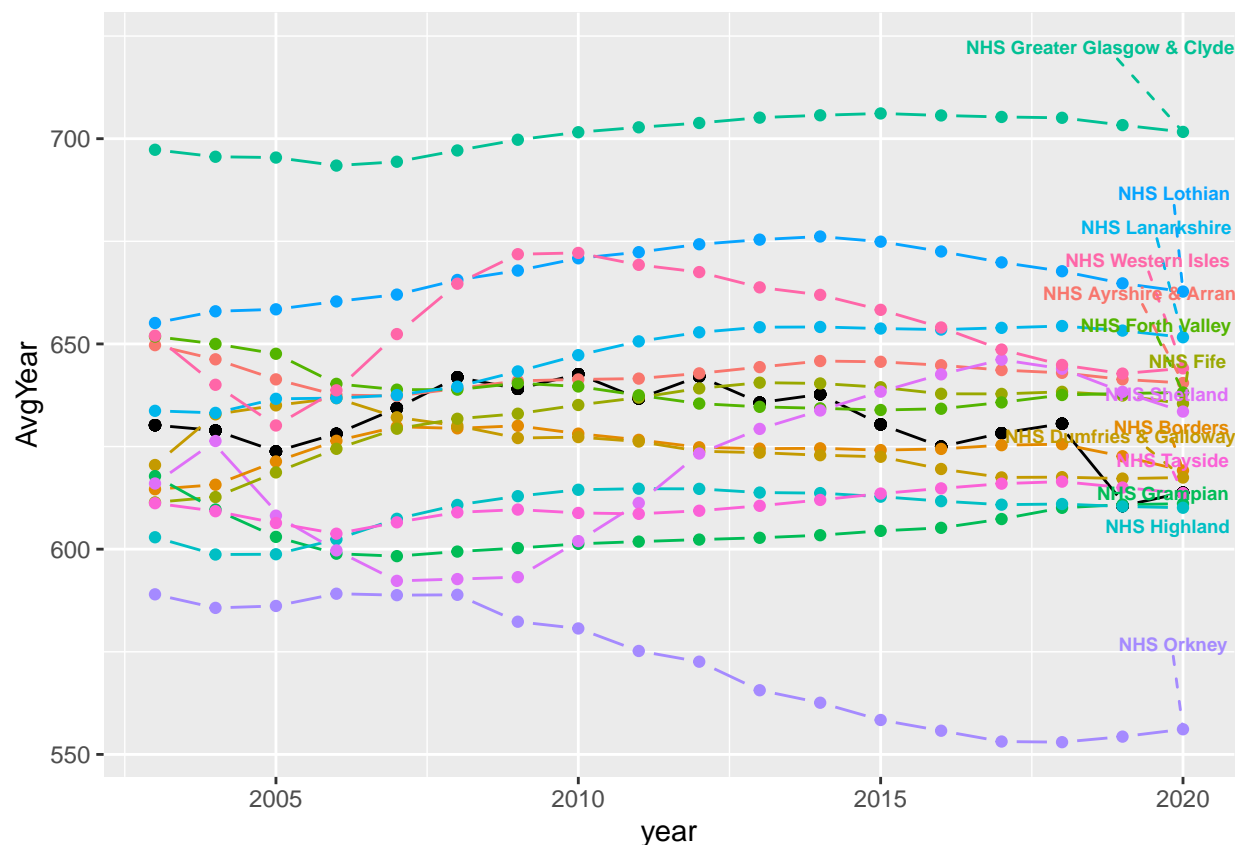
```
finalValues <- movingAvg %>%
  group_by(area_name) %>%
  summarise(
    lastMA = dplyr::last(MA),
    lastYear=dplyr::last(year)
  )
```

Display Summary of All Data

```
ggplot(data=cancerReg, aes(x = year)) +
  geom_pointline(data= avgYearly, aes(y = AvgYear)) +
  geom_pointline(data=movingAvg, aes(y=MA, col=area_name))+
  geom_text_repel(data = finalValues, aes(
    x = lastYear,
    y = lastMA,
    label = area_name,
    color=area_name),
    size = 2.5,
    fontface = "bold",
    nudge_y = 20.6,
    direction = "y",
    hjust= -0.7,
    segment.linetype=2,
    segment.size = 0.5,
    segment.curvature=0
  ) +
  theme(legend.position = "none")
```

```
## Warning in geom_pointline(data = avgYearly, aes(y = AvgYear)): `geom_pointpath`
## and `geom_pointline` have been soft-deprecated. A replacement can be found in
## ggh4x::geom_pointpath.
```

```
## Warning in geom_pointline(data = movingAvg, aes(y = MA, col = area_name)):
## `geom_pointpath` and `geom_pointline` have been soft-deprecated. A replacement
## can be found in ggh4x::geom_pointpath.
```



Calculate Differences

```
healthBoards <- cancerReg %>% filter(area_name %in% area_name)
print(healthBoards)
```

| ## | 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
```

```
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

```
inputFile <- "reportReg.pdf"
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) %>%
  kable_styling(latex_options = c("striped", "hold_poistion")) %>%
  row_spec(0, bold = TRUE) %>%
  kableExtra::landscape()
```

| area_code | area_name | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| S08000015 | NHS Ayrshire & Arran | 649.7 | 642.8 | 631.6 | 626.1 | 636.4 | 648.2 | 652.2 | 643.8 | 643.2 | 654.3 | 659.6 | 662.1 | 643.4 | 633.9 | 627.7 |
| S08000016 | NHS Borders | 614.6 | 616.8 | 632.7 | 641.5 | 643.5 | 627.5 | 633.8 | 614.8 | 614.5 | 608.5 | 621.2 | 625.5 | 618.9 | 628.1 | 638.2 |
| S08000017 | NHS Dumfries & Galloway | 620.5 | 645.2 | 639.4 | 642.1 | 613.4 | 619.8 | 609.1 | 628.9 | 617.6 | 602.7 | 619.9 | 616.1 | 617.9 | 580.9 | 588.2 |
| S08000019 | NHS Forth Valley | 651.8 | 648.2 | 642.8 | 618.3 | 633.2 | 638.9 | 649.8 | 634.1 | 620.3 | 617.3 | 626.7 | 630.4 | 628.9 | 638.2 | 657.1 |
| S08000020 | NHS Grampian | 617.8 | 601.5 | 589.7 | 586.6 | 595.9 | 605.0 | 605.4 | 608.5 | 606.2 | 606.8 | 607.1 | 610.3 | 617.1 | 614.8 | 637.2 |
| S08000022 | NHS Highland | 602.9 | 594.5 | 598.9 | 613.3 | 627.4 | 627.6 | 625.8 | 625.4 | 616.8 | 614.3 | 604.8 | 612.2 | 602.4 | 597.5 | 598.2 |
| S08000024 | NHS Lothian | 655.1 | 660.8 | 659.4 | 666.1 | 668.7 | 683.4 | 681.6 | 691.8 | 684.3 | 691.6 | 686.7 | 684.5 | 659.9 | 641.4 | 632.1 |
| S08000025 | NHS Orkney | 589.0 | 582.4 | 587.1 | 598.1 | 587.4 | 589.3 | 543.0 | 569.2 | 531.3 | 549.1 | 496.1 | 529.1 | 508.0 | 521.7 | 516.2 |
| S08000026 | NHS Shetland | 616.0 | 636.7 | 571.8 | 574.3 | 562.6 | 594.9 | 596.0 | 663.4 | 685.6 | 731.7 | 689.3 | 683.1 | 693.4 | 697.4 | 696.2 |
| S08000028 | NHS Western Isles | 652.0 | 628.1 | 610.3 | 664.4 | 707.2 | 726.0 | 715.0 | 674.4 | 646.0 | 651.6 | 626.6 | 641.8 | 614.6 | 598.1 | 573.2 |
| S08000029 | NHS Fife | 611.4 | 614.0 | 630.7 | 641.7 | 648.9 | 643.9 | 640.4 | 650.0 | 651.3 | 659.4 | 654.5 | 638.3 | 628.3 | 617.1 | 637.2 |
| S08000030 | NHS Tayside | 611.2 | 607.3 | 600.6 | 596.0 | 617.6 | 621.1 | 613.7 | 603.1 | 606.9 | 616.1 | 622.6 | 627.8 | 632.1 | 631.2 | 632.1 |
| S08000031 | NHS Greater Glasgow & Clyde | 697.3 | 693.9 | 695.0 | 687.6 | 698.1 | 710.9 | 715.4 | 714.4 | 712.3 | 713.3 | 718.2 | 712.0 | 711.5 | 699.3 | 700.2 |
| S08000032 | NHS Lanarkshire | 633.7 | 632.7 | 643.5 | 637.3 | 640.5 | 649.8 | 665.6 | 675.0 | 677.5 | 672.7 | 666.5 | 654.8 | 649.1 | 650.3 | 659.2 |

```
qpdf::pdf_rotate_pages(inputFile, pages=4 , angle=90)
```

```
## [1] "C:\\Users\\romin\\ToyRepo\\Models\\reportReg_output.pdf"
```

#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