# Header

---

title: "Analysis of college enrollment"

author: "Kelly Asche"

output:

html\_document:

toc: true

toc\_float: true

toc\_depth: 4

runtime: shiny

resource\_files:

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.cpg

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.dbf

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.prj

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.sbn

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.sbx

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.shp.xml

- Data/Shapefiles/County shapefiles/MNCounties\_MNDOT.shx

---

# Styling

<style type="text/css">

body{ /\* Normal \*/

font-size: 16px;

font-family: 'Open Sans', Arial, sans-serif;

}

h2 { /\* Header 2 \*/

font-size: 1.5em;

font-family: "Crete Round", serif;

}

h1 { /\* Header 1 \*/

font-size: 2.5rem;

font-family: "Crete Round", serif;

font-weight: bold;

}

a:link { /\*Link\*/

color: #076324;

font-weight: 600;

font-style: italic;

text-decoration: underline;

}

.header .text{

font-family: "American Typewriter";

float: right;

text-align: right;

font-size: 1.5rem;

}

</style>

# Library

```{r setup, include=FALSE}

knitr::opts\_chunk$set(echo = FALSE, warning = FALSE, message = FALSE)

library(tidyverse)

library(extrafont)

loadfonts()

library(sf)

library(ggrepel)

library(scales)

library(shiny)

library(shinycssloaders)

library(ggiraph)

library(kableExtra)

library(rmapshaper)

```

# Themes and shapefiles

```{r loading jon docs and shapefiles}

theme\_bar <- theme\_bw() +

theme(panel.grid.major = element\_line(color = "grey70", size = 0.1),

panel.grid.minor = element\_blank(),

axis.ticks = element\_blank(),

axis.text = element\_text(face = "bold"),

panel.border = element\_blank(),

legend.background = element\_rect(fill = "transparent", color = "transparent"),

legend.key = element\_rect(fill = "transparent"),

legend.title = element\_blank(),

text = element\_text(family = "Calibri", size = 15),

plot.caption = element\_text(hjust = 0.5, face = "italic"),

legend.text = element\_text(margin = margin(l = 2, r = 5)))

theme\_line <- theme\_bw() +

theme(legend.background = element\_rect(fill = "transparent", color = "transparent"),

legend.key = element\_rect(fill = "transparent"),

panel.grid.minor = element\_blank(),

panel.grid.major = element\_line(color = "grey70", size = 0.1),

axis.ticks = element\_blank(),

axis.text = element\_text(face = "bold"),

panel.border = element\_blank(),

text = element\_text(family = "Calibri", size = 15),

plot.caption = element\_text(hjust = 0.5, face = "italic"),

legend.text = element\_text(margin = margin(l = 2, r = 5)))

theme\_sf <- theme\_bw() +

theme(axis.text.x=element\_blank(),

axis.text.y=element\_blank(),

axis.ticks=element\_blank(),

panel.background = element\_blank(),

panel.grid.major = element\_line(color = "white"),

panel.border = element\_blank(),

plot.title = element\_text(hjust = 0.5),

legend.title = element\_blank(),

text = element\_text(family = "Calibri", size = 15),

plot.caption = element\_text(hjust = 0.5, face = "italic"),

legend.text = element\_text(margin = margin(l = 2, r = 5)))

counties.regions <- read\_csv("Data/Join docs/county\_regions.csv") %>%

mutate(countyfp = formatC(countyfp, width = 3, flag = "0"),

Name = str\_to\_title(Name),

Name = str\_replace(Name, "Q", "q"),

Name = str\_replace(Name, "Of The", "of the"),

Dem\_Desc = ifelse(Name == "Minnesota", "Minnesota", Dem\_Desc))

color.ruca <- c("Entirely rural" = "#5CA81F", "Town/rural mix" = "#C7EF99", "Urban/town/rural mix" = "#d8b365", "Entirely urban" = "#a6611a", "Minnesota" = "black")

color.pr <- c("Northwest" = "#810f7c","Northeast" = "#fe9929", "Central" = "#076324", "Seven County Mpls-St Paul" = "#d8b365", "Southwest" = "#1f78b4", "Southeast" = "#d7301f", "Minnesota" = "black")

color.edr <- c("EDR 1 - Northwest" = "#b3cde3", "EDR 2 - Headwaters" = "#8c96c6", "EDR 3 - Arrowhead" = "#fe9929", "EDR 4 - West Central" = "#8856a7", "EDR 5 - North Central" = "#810f7c", "EDR 6E- Southwest Central" = "#e5f5f9", "EDR 6W- Upper Minnesota Valley" = "#bdc9e1", "EDR 7E- East Central" = "#99d8c9", "EDR 7W- Central" = "#2ca25f", "EDR 8 - Southwest" = "#74a9cf", "EDR 9 - South Central" = "#0570b0", "EDR 10 - Southeast" = "#d7301f", "EDR 11 - 7 County Twin Cities" = "#d8b365", "Minnesota" = "black")

color.counties <- scale\_color\_brewer(palette = "Dark2",

guide = guide\_legend(ncol = 3))

mn\_counties1 <- st\_read("Data/Shapefiles/county shapefiles/MNCounties\_MNDOT.shp", quiet = TRUE)

mn\_counties <- ms\_simplify(mn\_counties1, keep = .01, keep\_shapes = TRUE)

```

# Geom\_Line

## Non-shiny

```{r nobles and mower pop trends, cache=TRUE, fig.align="center", fig.width=9, fig.height=6}

caption = label\_wrap\_gen(75)("Figure 2: The peak population in Nobles and Mower County occured in the mid-1950's, but are currently experiencing population gains again after decades of declines. Data: U.S. Census Bureau - Decennial Census & ACS 5-year")

ggplot(pop.nobles.mower, aes(year, population, color = Name)) +

geom\_smooth(se = FALSE, size = 1.5) +

geom\_point(size = 3) +

labs(x="", y = "", color="", title = "Population", caption = caption)+

scale\_y\_continuous(labels=scales::comma)+

scale\_x\_continuous(breaks = seq(1900, 2050, 10)) +

theme\_line+

scale\_color\_brewer(palette = "Dark2",

guide = guide\_legend(ncol = 3)) +

theme(legend.position = "bottom")

```

## Shiny

caption = label\_wrap\_gen(105)("Figure 20: The job vacancy rate is the ratio of vacant job positions to all jobs. A high vacancy rate indicates a relatively strong demand for workers. The highest job vacancy rates exist outside of the Twin Cities seven-county metro. Data: MN DEED Job Vacancy Survey")

plot <- ggplot(jv.pr, aes(year, vacanrate, color = Name)) +

geom\_smooth(se = FALSE, size = 1.5) +

geom\_point\_interactive(size = 3, aes(data\_id = vacancies, tooltip = paste(Name, ", ", year, ": There was ", round(vacancies), " job vacancies on average each quarter which was ", percent(vacanrate), " of the total filled jobs in the region.", sep = ""))) +

labs(x="", y = "", color="", title = "Job vacancies as a percent of total employment", caption = caption)+

scale\_y\_continuous(labels=scales::percent)+

scale\_x\_continuous(breaks = seq(1900, 2050, 2)) +

theme\_line+

scale\_color\_manual(values= color.pr,

guide = guide\_legend(ncol = 3)) +

theme(legend.position = "bottom")

plot.a <- girafe( ggobj = plot, width\_svg = 8)

girafe\_options(plot.a,

opts\_selection(type = "none"),

opts\_toolbar(saveaspng = FALSE) ,

opts\_sizing(rescale = FALSE))

})

},

option = list(height = 510)

# Geom\_Bar

## Non-shiny

## Shiny

caption = label\_wrap\_gen(85)("Figure 3: The town/rural and urban/town/rural mix county groups are seeing significantly lower annual population gains from 2010 to 2017 than they did from 2000 to 2010. Data: U.S. Census Bureau, Population Estimates")

plot <- ggplot(filter(popchange.ruca, type == "Total population change"), aes(Dem\_Desc, annual, fill = year)) +

geom\_bar\_interactive(stat = "identity", position = "dodge", aes(data\_id = data\_id, tooltip = ifelse(year == "2000 to 2010", paste(Dem\_Desc, ": from 2000 to 2010 there was an annual population change of ", comma(round(annual))), paste(Dem\_Desc, ": from 2010 to 2017 there was an annual population change of ", comma(round(annual))))))+

labs(x="", y = "", title = "Average annual population change, 2000 to 2010 compared\nto 2010 to 2017", caption = caption)+

scale\_y\_continuous(labels=scales::comma)+

theme\_bar+

theme(legend.position = "bottom",

legend.title = element\_blank())+

scale\_fill\_manual(values=c( "grey", "black"))

plot.a <- girafe( ggobj = plot, width\_svg = 7)

girafe\_options(plot.a,

opts\_selection(type = "none"),

opts\_toolbar(saveaspng = FALSE) ,

opts\_sizing(rescale = FALSE))

})

},

options = list(height = 550)

)

# Geom\_SF

## Non-shiny

```{r prep ruca map, fig.align="center", fig.height=7}

ruca.map <- counties.regions %>%

left\_join(mn\_counties[,c(4,7)], by = c("countyfp" = "FIPS\_CODE")) %>%

mutate(Dem\_Desc = as.factor(Dem\_Desc),

Dem\_Desc = fct\_relevel(Dem\_Desc, "Entirely rural", "Town/rural mix", "Urban/town/rural mix", "Entirely urban"))

caption <- label\_wrap\_gen(75)("Figure 1: The MN State Demographic Center analyzed census tracts in each county to determine their category. Data: MN State Demographic Center")

ggplot(ruca.map) +

geom\_sf(aes(fill = Dem\_Desc)) +

scale\_fill\_manual(values = color.ruca)+

theme\_sf+

labs(title="County categories for rural-urban\ncommuting areas", caption = caption)

```

## Shiny

caption <- label\_wrap\_gen(65)("Figure 1: The MN State Demographic Center analyzed census tracts in each county to determine their category. Data: MN State Demographic Center")

plot <- ggplot(ruca.map) +

geom\_sf\_interactive(aes(fill = Dem\_Desc, tooltip = paste(Name, "\n", Dem\_Desc), data\_id = Name)) +

scale\_fill\_manual(values = color.ruca)+

theme\_sf+

labs(title="County categories for rural-urban\ncommuting areas", caption = caption)

plot.a <- girafe( ggobj = plot, width\_svg = 6)

girafe\_options(plot.a,

opts\_selection(type = "none"),

opts\_toolbar(saveaspng = FALSE) ,

opts\_sizing(rescale = FALSE))

})

},

options = list(height = 610)

# Kable

kable(format = "html", har.names.pr, escape = F) %>%

kable\_styling(bootstrap\_options = "striped", full\_width = FALSE) %>%

scroll\_box(width = "100%", height = "300px")

# DT()

datatable(har.inc.rev.list, class = "cell-border stripe", filter = "top") %>%

formatStyle("income.loss",

target = "row",

backgroundColor = styleInterval(c(-34017629, 0), c("red", "red", "transparent"))) %>%

formatCurrency(5:7, "$")

# Factor levels

## RUCA

mutate(Dem\_Desc = fct\_relevel(Dem\_Desc, "Entirely rural", "Town/rural mix", "Urban/town/rural mix", "Entirely urban"))

## Planning Region

mutate(planning.region = fct\_relevel(planning.region, "Northwest", "Northeast", "Central", "Seven County Mpls-St Paul", "Southwest", "Southeast"))

## EDR

mutate(edr = fct\_relevel(edr, "EDR 1 - Northwest", "EDR 2 - Headwaters", "EDR 3 - Arrowhead", "EDR 4 - West Central", "EDR 5 - North Central", "EDR 6E- Southwest Central", "EDR 6W- Upper Minnesota Valley", "EDR 7E- East Central", "EDR 7W- Central", "EDR 8 - Southwest", "EDR 9 - South Central", "EDR 10 - Southeast", "EDR 11 - 7 County Twin Cities", "Minnesota"))

# Colors for industries

industry.colors <- c('Accommodation and Food Services'='black', 'Construction'='#1f78b4', 'Educational Services'='#b2df8a', 'Health Care and Social Assistance'='grey', 'Manufacturing'='#fb9a99', 'Other Services, Ex. Public Admin'='#e31a1c', 'Public Administration'='#fdbf6f', 'Retail Trade'='pink', 'Wholesale Trade'='#cab2d6', 'Arts, Entertainment, and Recreation'='#6a3d9a', 'Transportation and Warehousing'='#ffff99', 'Finance and Insurance'='#b15928', 'Professional and Technical Services'='#ff7f00', 'Administrative and Waste Services'='#33a02c', 'Agriculture, Forestry, Fishing & Hunting'='#a6cee3', 'Management of Companies and Enterprises'='#800000', 'Mining'='#b2df8a', 'Real Estate and Rental and Leasing'='#C7EA46', 'Utilities'='#2f4f4f', 'Information' = '#8ffcff')

# Colors for occupations

occupation.colors <- c('Architecture and Engineering Occupations'='#b2df8a','Arts, Design, Entertainment, Sports, and Media Occ'='#6a3d9a','Building and Grounds Cleaning and Maintenance Occu'='#33a02c','Business and Financial Operations Occupations'='#b15928','Community and Social Service Occupations'='#cab2d6','Computer and Mathematical Occupations'='#8ffcff','Construction and Extraction Occupations'='#1f78b4','Education, Training, and Library Occupations'='#b2df8a','Farming, Fishing, and Forestry Occupations'='#a6cee3','Food Preparation and Serving Related Occupations'='black','Healthcare Practitioners and Technical Occupations'='grey','Healthcare Support Occupations'='#C7EA46','Installation, Maintenance, and Repair Occupations'='#2f4f4f','Internships'='black','Legal Occupations'='#ff7f00','Life, Physical, and Social Science Occupations'='black','Management Occupations'='#800000','Office and Administrative Support Occupations'='#fdbf6f','Personal Care and Service Occupations'='#ff0000','Production Occupations'='#fb9a99','Protective Service Occupations'='#ff9933','Sales and Related Occupations'='pink','Transportation and Material Moving Occupations'='#ffff99')

occupation.colors.short <- c('Architecture and Engineering'='#b2df8a','Arts, Design, Entertainment, Sports, and Media'='#6a3d9a','Building and Grounds Cleaning and Maintenance'='#33a02c','Business and Financial Operations'='#b15928','Community and Social Service'='#cab2d6','Computer and Mathematical'='#8ffcff','Construction and Extraction'='#1f78b4','Education, Training, and Library'='#b2df8a','Farming, Fishing, and Forestry'='#a6cee3','Food Preparation and Serving Related'='black','Healthcare Practitioners and Technical'='grey','Healthcare Support'='#C7EA46','Installation, Maintenance, and Repair'='#2f4f4f','Internships'='black','Legal'='#ff7f00','Life, Physical, and Social Science'='black','Management'='#800000','Office and Administrative Support'='#fdbf6f','Personal Care and Service'='#ff0000','Production'='#fb9a99','Protective Service'='#ff9933','Sales and Related'='pink','Transportation and Material Moving'='#ffff99')

# Industry Codes

|  |  |
| --- | --- |
| indcode | naicstitle |
| 11 | Agriculture, Forestry, Fishing & Hunting |
| 21 | Mining |
| 22 | Utilities |
| 23 | Construction |
| 31 | Manufacturing |
| 42 | Wholesale Trade |
| 44 | Retail Trade |
| 48 | Transportation and Warehousing |
| 51 | Information |
| 52 | Finance and Insurance |
| 53 | Real Estate and Rental and Leasing |
| 54 | Professional and Technical Services |
| 55 | Management of Companies and Enterprises |
| 56 | Administrative and Waste Services |
| 61 | Educational Services |
| 62 | Health Care and Social Assistance |
| 71 | Arts, Entertainment, and Recreation |
| 72 | Accommodation and Food Services |
| 81 | Other Services, Ex. Public Admin |
| 92 | Public Administration |

# GGSAVE

ggsave(filename = "wage percentiles.png", type = "cairo", dpi = "print", width = 6, height = 4)

theme(legend.position = "bottom",

strip.background = element\_blank(),

legend.text = element\_text(size = 10),

axis.text = element\_text(size = 10),

axis.title = element\_text(size = 11))