

1. How Does the Nutrition and Food Intake of the Children in the US Differ from Those from the Rest of the World? \Rightarrow Nutrient

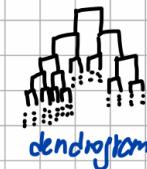
2. Do Socioeconomic Variables Impact the Child Obesity in the US? \Rightarrow income & race

1. Nutrients & food groups of countries

- lack of Ains in food group - classify juxtaposition
- nutrients are more complex
- similarity measurement + quantity discrete vs



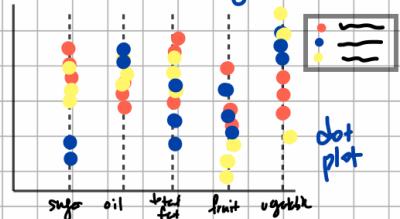
tree map



dendrogram



Chernoff's faces



sugar oil total fat fruit vegetable

dot plot

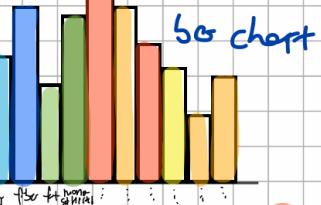
2. Socioeconomic Var to obesity & food / nutrients

- compare & juxtapose by clustering?
- fair race & income group
- \hookrightarrow explaining obesity rate via nutrient & food
- obesity rate & regional income/race proportion level

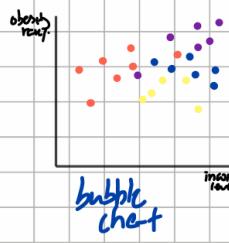


poor white
black hispanic
asian

Sugar
nicotin Polysaturated Fat Word
Carbohydrate fiber vitamin C
Cholesterol vitamin E



bar chart



bubble chart



black % white %
hispanic % asian %

filter *

- * Food group comparison of each country (incomplete data)
- * choroplet world map (not child countries)
- * Doughnut chart (too many variables + too many in juxtaposition)
- * pie chart (unclear for many)
- * word map (quantity, many)

parallel coordinate plot

dendrogram

tree map

Categorize *

three major components to consider:

1. Nutrient / food group consumption (quantifiable)
2. obesity rate (quantifiable)
3. juxtaposition of each "group's nutrient / food group intake"

1.



tree map: each color each nutrient

Chernoff's face: each face white race each nutrient group.

even stack bar represent one nutrient / food group. multiple stack bars each group

present every style nutrient element by each bar. grouped by color

2.



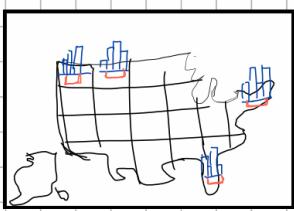
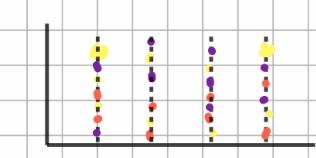
obesity rate

income group

Simple visualization of each group obesity rate by bar chart

combine two scatter plots into one bubble chart. add + report three variables each step

Combine & Refine *

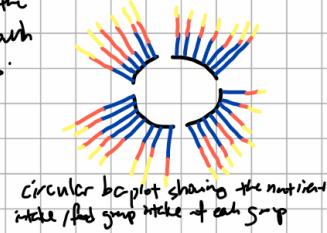


income1 income2 income3 income4 income5

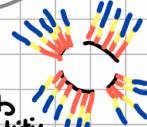
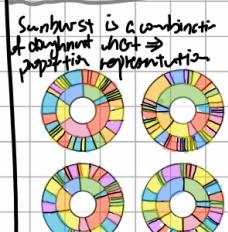
tree map: juxtapose inside of each food / nutrient group of each cluster. map of income / race proportion by bar chart

Bubble chart showing the relationship between income, race proportion, and obesity rate.

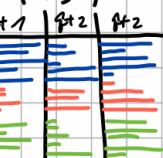
bar chart represent the obesity rate based on each comparison category.



circular bar chart showing the nutrient intake / food group intake at each step

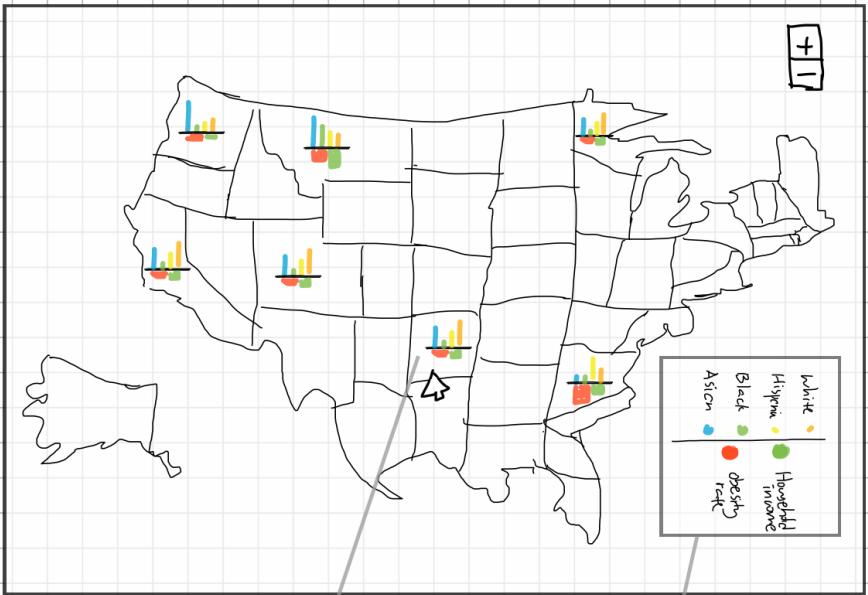


balloon plot to see similar / different patterns / each radial line represent each food step



multiple bar chart stacked up + st.

Layour

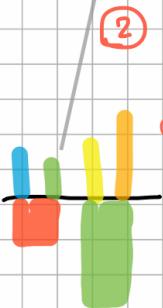


Focus



Massachusetts	
White:	..%
Black:	..%
Asian:	..%
Hispanic:	..%
Median HH income:	\$..
obesity rate:	..%

- ① When the user clicks a specific state, the relevant information of race proportion, Median Household income, obesity rate pops up.



- ② Each state has a bar chart. Upper bar chart is the race proportion, the lower chart is the median household income and the obesity rate.

Title: Child Obesity Rate, Median Household Income, and Race Proportion of each State

Author: Dathyte KIM

Date: 21/10/20 Sheet: FITS147-1

Audience: Awareness Campaign for policy-makers, school officials, and Patients

Operations

- ① When the user hovers the mouse over a state on the US map, the back-to-back bar chart along with detailed info of each bar will pop up.
- ② The bar chart above is the race proportion of each state, while the ones at the bottom are the median household income and child obesity rate of each state.
- ③ The user can zoom in or out from the map. If the map is zoomed out, only the bar chart of relatively large states will be shown.

Discussion

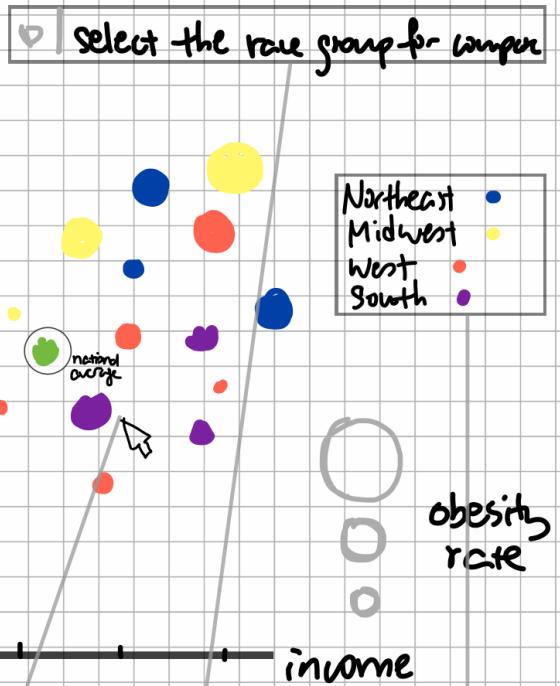
This visualization is a combination of map and back-to-back bar charts. The user doesn't need to select race/income level as comparison group for child obesity rate, but the bar chart on each state directly visualizes all the relevant info of socioeconomic variables and child obesity rate.

This map, unfortunately, cannot inform the user on national average since the bar charts are only allocated to each state. Therefore, the national average of race distribution, median household income, and child obesity rate needs to be visualized separately.

Additionally, it is very difficult to have a clear juxtaposition on the relationship between child obesity rate and socioeconomic variables in each state. The charts are hidden in smaller states when zoomed out in order to prevent messy presentation of bar chart. This then hinders the direct juxtaposition of all states in the US.

Layout

Race proportion



Focus

Texas
income : \$.00
race pro : %
obesity : %

① select the race group

- All
- non-Hispanic white
- Black
- Hispanic
- Asian

② The users can choose which race proportion on the y-axis they're looking at

③ Each colour represents each region in the US

Title: Child Obesity rate of U.S based on Race, compared to Income Level

Author: Dathyte kIM

Date: 2/1/10/20 Sheet: FITS147-2

Audience: Awareness Campaign for policy-makers, school officials, and Patients

Operations

- ① The y-axis of the bubble chart is the proportion of a selected race from the drop-down menu above. The user can only select one race for the y-axis.
- ② When the user hovers the mouse on each bubble, the information on the child obesity rate, median household income, and the distribution of selected race of a state is provided in the pop-up box. Each bubble represents each state in the U.S.

Discussion

The bubble chart can easily visualize the relationship between race proportion, income, and obesity rate of each state and the country as well. The bubbles are also categorized based on the region that each state belongs to by each color, which could provide comparison based on regional level as well.

However, the y-axis of the bubble chart can only represent one race. This hinders the users to compare the obesity rate & median household income of each race in one sight.

Layout

Select state



Focus

①

Select state

- All
- Alaska
- Arkansas
- Arizona
- California
- Colorado
- Connecticut
- Delaware

②

California, CA
Child Obesity rate: ..%
Median Household income: \$xx,xxx
Proportion of race:
White: ..%
Black: ..%
Hispanic: ..%
Asian: ..%

Title: Obesity Rate of U.S Children based on Race, Income Level and in Comparison to other Countries

Author: Dattye KIM

Date: 2/1/10/20 Sheet: FITS147-3

Audience: Awareness Campaign for policy-makers, School officials, and Patients

Operations

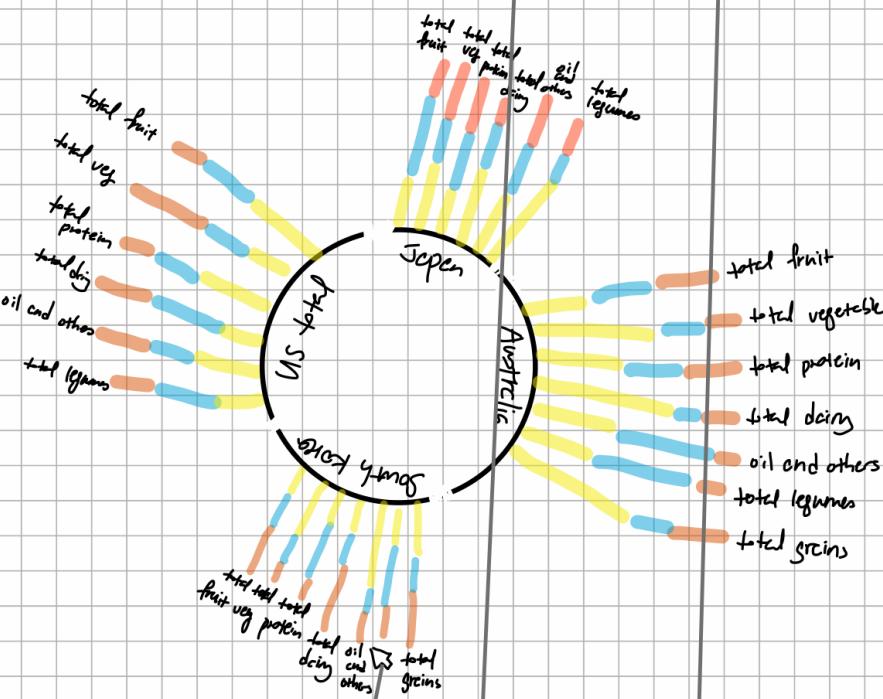
- ① The users can choose individual or multiple states for comparison. The default option is all states selected.
- ② When the user hovers over a bar, the relevant numeric of each attribute of the state will show up in the pop-up box.

Discussion

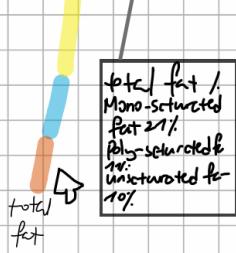
The side-by-side barplot is very straightforward visualisation of multiple attributes simultaneously. The user can select states for comparison and the portion in difference of each attribute can be shown immediately.

However, since there are 50 states in the U.S., there are 51 rows in total. Listing out each attribute and each row can be very space-insufficient and comparison/juxtaposition of values can be inaccurate with such visualisation.

Layout



Focus



select the cluster
by countries ✓
by US income level
by race group in US

select the variable
Nutrient daily intake ✓
(food group daily intake)

Title: Food group/nutrient intake of U.S children compared by income group/race/other variables (proportion)
Author: Dattye Kim

Date: 21/10/20 Sheet: F1TS147-5

Audience: Awareness Campaign for policy-makers, School officials, and Parents

Operations

① Each stacked bar represents a food/nutrient group, and the areas within the stacked bars are specific food type/nutrient element. When the user clicks on a specific area of a stacked bar, the proportion of specific food/nutrient takes within the food/nutrient groups pops up. The proportion of the entire stacked bar in comparison to the entire daily consumption of nutrients/food group is also provided.

② The user can choose the comparison group on the x-axis with the drop-down menu.

③ The user can choose either food group or nutrient group on the y-axis.

Discussion

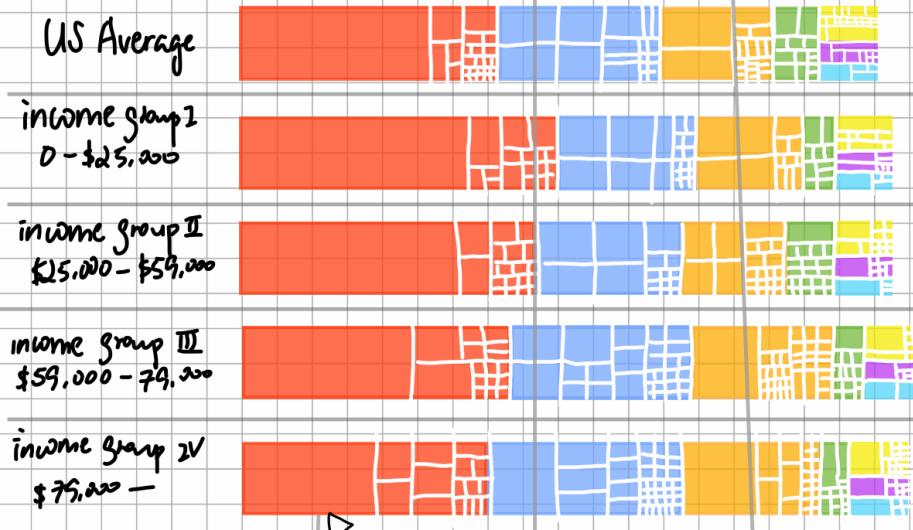
The circular stacked bar is an alternative version of circular bar plot. Instead of listing each stacked bar of each comparison group, which is space-inefficient and difficult for comparison, the circular stacked bar plot summarizes stacked bar of each comparison group into a circle. This offers a very straightforward comparison of each group in one sight.

However, due to the allocation of each stacked bar, an effective and accurate comparison could be quite difficult. Additionally, unlike this exemplary visualisation, each food/nutrient group would contain up to 10 different food/nutrient elements, which could make the stacked bars become very messy and thus even worsened comparison.

Layout



- Select the variable
- Select the cluster



Focus

Added sugar
..% of total food intake
..% of total "oil and others"
22.5g

- ① A pop up box showing the proportion of the specific food in total food intake, total food group category intake, as well as the quantity of intake

Select the cluster
by countries ✓
by US income level
by race group in US

- ② Three comparison groups to choose from

Select the variable
Nutrient daily intake ✓
(food group daily intake)

- ③ The user can compare either daily intake of nutrient or food group of specified comparison group

Title: Food group/nutrient intake of U.S children compared by income group/race/other variables (proportion)

Author: Dohyee KIM

Date: 21/10/20 Sheet: FITS147-4

Audience: Awareness Campaign for policy-makers, School officials, and Parents

Operations

- ① Each rectangle/square of tree map represents a type of food/nutrient. When a user hovers over a region in a tree map, the proportion of the food takes within the food/nutrient group, the proportion it takes within the entire daily consumption, and brief information regarding the food/nutrient is provided in a pop-up box.
- ② The user can choose the comparison group on the x-axis with the drop-down menu.
- ③ The user can choose either food group or nutrient group on the y-axis.

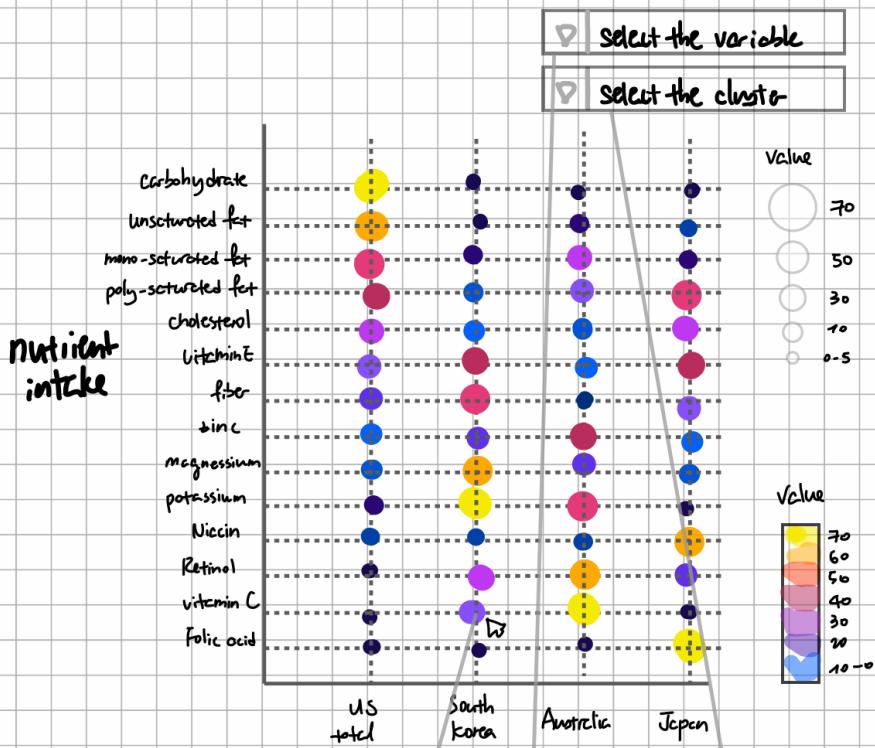
Discussion

This visualisation combined the tree maps and bar charts together for clear comparison of each food/nutrient group consumption by the U.S children. This graph was motivated based on Tableau.

This graph can visualise the proportion of each nutrient/food intake within the respective nutrient/food group, and is listed like a bar plot, which thus enhances visualising comparison.

Unfortunately, so far, I could not find any similar graphs that I could learn online that perfectly assimilates this visualisation. This would drastically enhance the difficulty of the realisation process.

Chayant



Focus

③

South Korea
Vitamin C intake
... Mg
Vitamin C is in
food such as ...
...

②

Select the cluster

by countries
by US income level
by race group in US

①

Select the variable

Nutrient daily intake
(food group daily intake)

Title: Food group/nutrient intake of U.S children
Compared by Income Group/Race / other Countries

Author: Daeye KIM

Date: 21/10/20 Sheet: FIT5147-4

Audience: Awareness Campaign for policy-makers,
School officials, and Patients

Operations

- ① The user can use dropdown menu to choose either nutrient or food groups on the y-axis of balloon plot. If the x-axis is each country, the y-axis is only available for nutrient consumption comparison.
- ② The comparison group on the x-axis can be different countries, income levels, or race group. If the user chooses different countries for x-axis, the y-axis automatically shows nutrients only.
- ③ When the user hovers over each balloon, the nutrient/food type consumption info and a brief information of the nutrient/food type is provided.
- ④ The y-axis is sorted based on the consumption level of US children for better comparison.

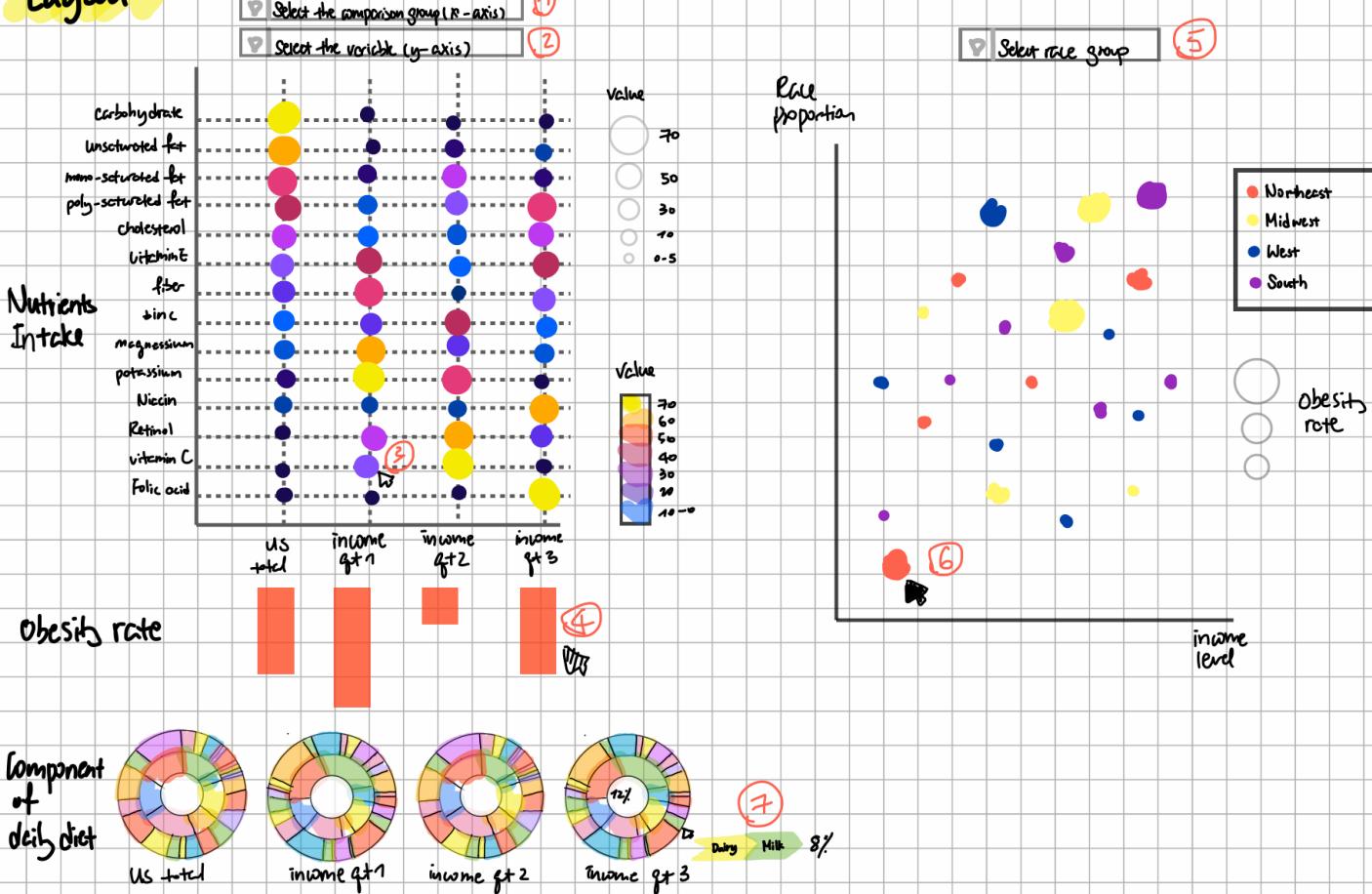
Discussion

Balloon plot is a combined graph of dot plot and bubble plot. It supports multiple dimensions of categorical and quantitative variables and thus aids the user to easily juxtapose difference amongst comparison groups. The plot is very straightforward with its message, and thus is a good choice for audience who are not used to complicated visualizations (parents of school children).

However, the units and range of intake quantity of food group & nutrients differ greatly. E.g. fat is consumed in tens of grams, while vitamin C is consumed in tens of milligrams. Therefore, the key to better comparison via balloon plot is the standardization of units and quantity.

Additionally, balloon plot itself cannot provide information of proportion of certain food/nutrient in comparison to a child's diet of an entire day.

Layout



Focus

- ① Select the variable
Nutrient daily intake ✓
(Food group daily intake)
- ② Select the cluster
by countries ✓
by US income level
by race group in US
- ③ Income gt 1
Vitamin C intake
... mg.
Vitamin C is in food such as ...
...
- ④ Income gt 2
Obesity rate 18%
- ⑤ Select race group
Non-Hispanic White
Black
Hispanics
Asian
- ⑥ New Jersey
Median Household Income:
\$ xx,000
Distribution of Asians:
xx%
Child Obesity rate:
xx%
- ⑦ Dairy Milk 8%

Title: Food group/nutrient intake of U.S children Compared by Income Group/ Race / other Countries

Author: DaHyue KJM

Date: 21/10/20 Sheet: FITS147 - 7

Audience: Awareness Campaign for policy-makers, School officials. And Parents

Discussion

Major software - R. shiny

Library - Ggplot { ggplot2 }
ggplot + geom_point

Library gghthem - colour-themes & aesthetics
"solarised"
↳ sharp contrast in colour yet easy on eyes

The standardisation of different nutrient / food group intake units is the key to pleasing visualisation

The visualisation might take 1 week to finish due to my insufficient skills in R.

The plot should be followed by some small paragraphs explaining key observations

- Operations**
- ① The user can either look at the nutrient intake or food group intake of U.S children
 - ② The user can choose a comparison group to U.S total - other countries, based on race group vs income level
 - ③ When the user hovers over a "balloon" on balloon chart, a brief information of specific nutrient/food type and the qty intake pops up
 - ④ When the user hovers over a bar at the bar chart, the obesity rate of respective group pops up
 - ⑤ For the bubble chart, the user looks at the relationship between obesity rate, race and income level. The y-axis is the distribution of selected race group
 - ⑥ Each bubble in the bubble chart represents each state. The median household income, Child obesity rate, and the distribution of selected race is shown when the user hovers over a bubble
 - ⑦ Since parents are also the audience of this visualisation, they might or not aware of each and every food group. To aid their understanding, I visualise the proportion of food/nutrient in daily diet of children in each category. The proportion pops up when hover over an area.