Dietary trends among children across financial classes

Data: 1999 — 2011

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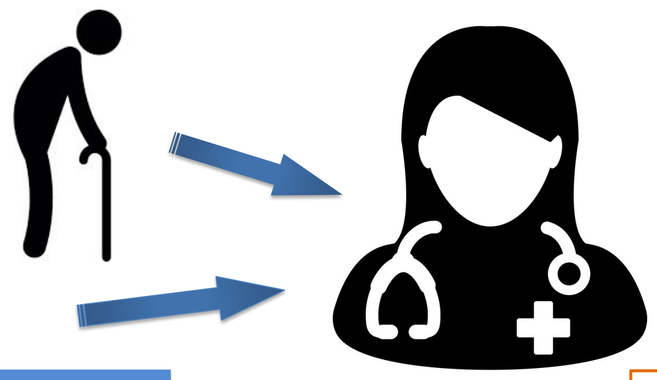
Project: March, 2018

Incidence of Diabetes

Average person to be diagnosed in 1990



Average person to be diagnosed in 2010

Average age of diagnosis has come down 20 years in the last 2 decades

Alarming rise in cases among children

Can we find diet intake trends amongst children across classes which may affect health when they become adults?

Changes in lifestyle

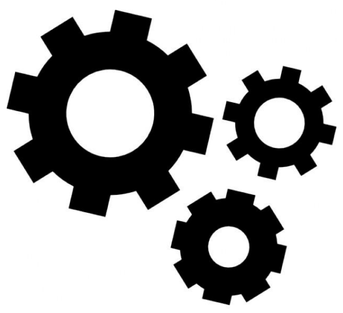
- Lack of physical activity
- Irregular sleeping patterns
- Imbalanced Diet
  - Macronutrients
  - Micronutrients

Dietary Data:
National Health and Nutrition Examination Survey (NHANES) over 12 years [1999-2011]

Workflow

Extracted Demographic data from each child

Ingested corresponding macronutrient intake



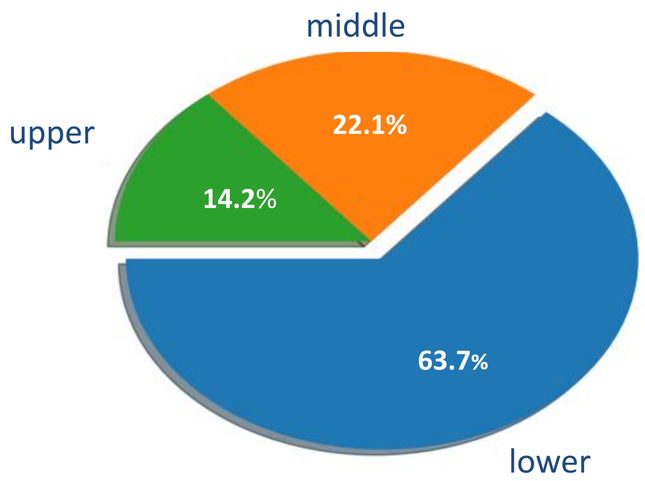
Identified children <13 years

Deleted records with missing entries (not many)

Converted strings to features

Classified children into three classes based on the income of the household – Income to poverty threshold ratio (ipr)

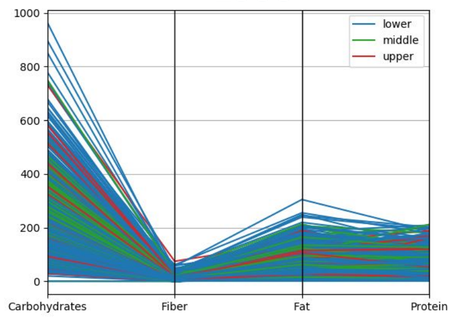
Class Wise Children Distribution



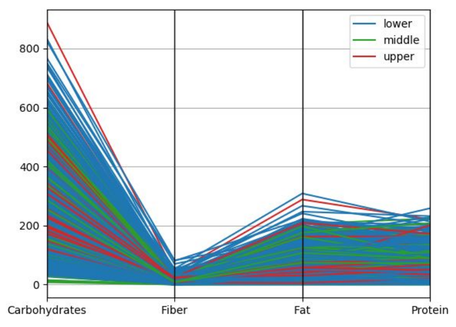
Clustering and Trend Analysis

Representation of per day nutrient intake in (g) across classes

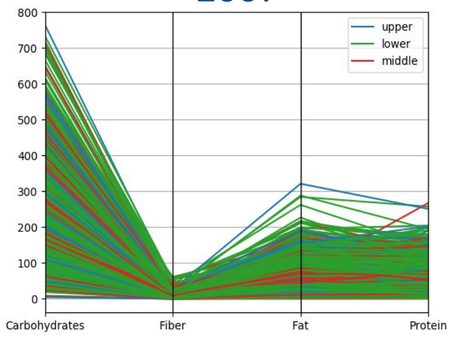
1999



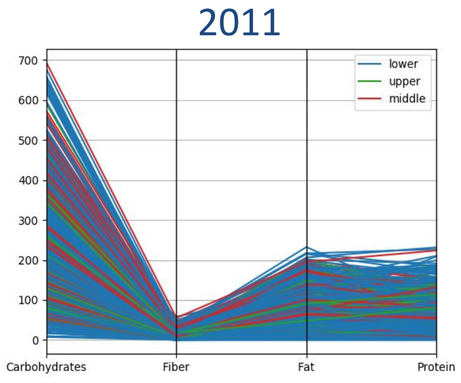
2003



2007



2011

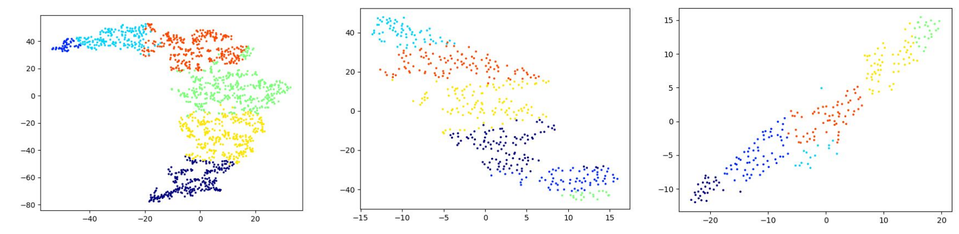


- Carbohydrate consumption → significantly high
- Fiber consumption → extremely low
- Average carb consumption per day has been decreasing over the years

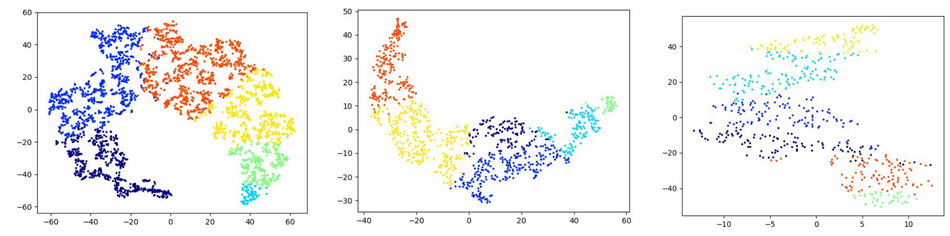
Clustering using K-Means

- K yields the least within set sum of squares error (WSSSE) → 6
- Distance metric → Euclidean
- 6 clusters correspond the 6 sections of ipr values ranging from 1 → 6
- Clusters generated are 2D depictions of 4D information

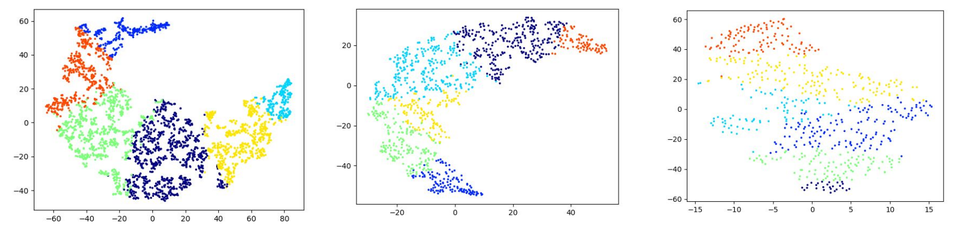
1999



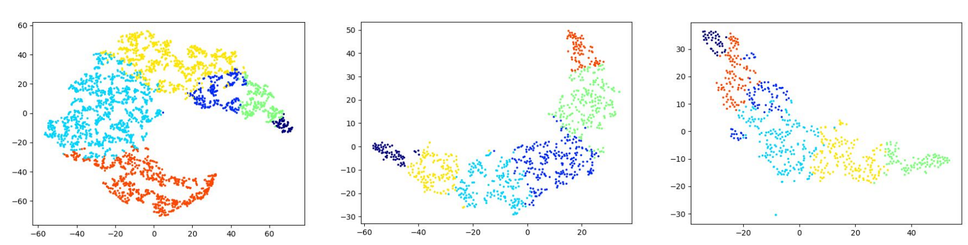
2003



2007



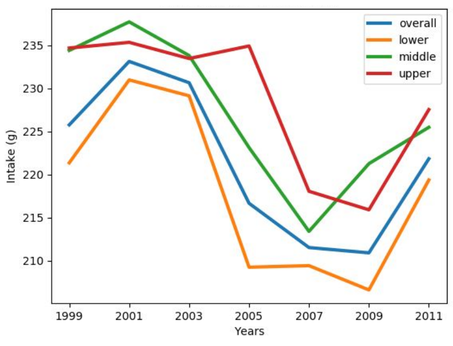
2011



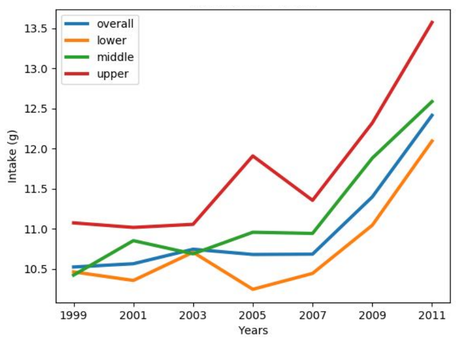
Few Insights

- Food intake irrespective of financial class is carbohydrate dominant
- High carb intake may be due to the increase in junk and soda intake among children.
- The overall mean dietary intake is close to lower financial class behavior because they form the majority in the dataset

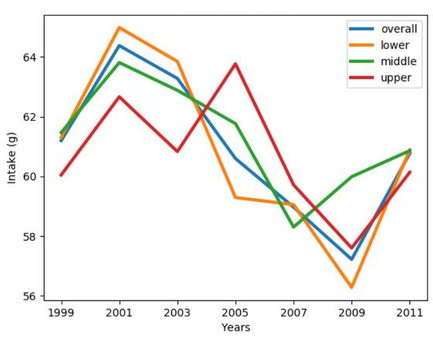
Class Wise Nutrient Intake Trend (1999-2011)



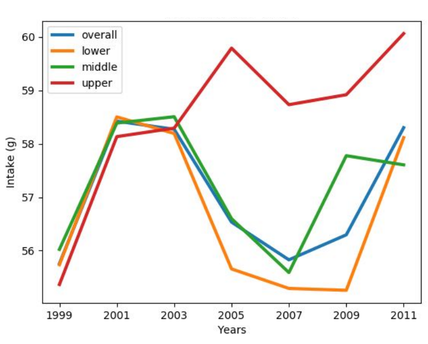
Carbohydrates



Fiber



Fat



Protein

- Upper financial classes consume higher quantities of macronutrients
- They outperform other classes especially in fiber and protein intake
- This may be due to greater diet awareness and also a superior educational background.

- Lower financial classes fall behind other classes in overall macronutrient consumption and have the highest possibility of diabetes diagnosis.
- This may unfortunately be due to lack of access to high quality food and education.