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# NON-MEDICAL DETERMINANT OF HEALTH FACTOR: ALCOHOL AND TOBACCO CONSUMPTION

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Mercury link:

[https://mercury.swin.edu.au/cos30045/s101224021/Lab\\_Overview/Website/index.html](https://mercury.swin.edu.au/cos30045/s101224021/Lab_Overview/Website/index.html)

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## Background and Motivation

In the modern era, tobacco and alcohol is one of the common methods to reduce peoples' tension and relieve their stress. As well as one of the great factors that guide as non-medical determinant death of the population. As large quantity growth on consumption, people may not still be aware of the impact of it. Hence, in this project, the motivation that guided the group was to present a clear visualization of the graph to further attract several groups such as policymakers, and health and medical carers. The visitor may utilize these graphs as a collection of references to gain and spread the potential health hazards of continuing to consume alcohol and tobacco. As well as engage the visitor to promote this reference to enhance social awareness of this potential hazard.

## Visualization Purpose

After the visitor views the data visualization graph of the trendline(line chart), the population of consumption between males and females (bar chart), and the proportion of both smoking and alcohol status (pie chart).

The visitors can understand the following questions:

- Comparison of the trend between time intervals.
- specific time point of where change starts.
- Comparative consumption levels of males versus females.
- Relative proportion of the status relating to smoking versus alcohol consumption.

Furthermore, the possible benefits of completed visualization include:

- Informing the stakeholders relative to a specific field about the impact on the health of the average person.
- Enhance public awareness about the consumption trend and health risks.
- Further study with the research of trend analysis and potential health risk.

## Schedule

### Week 1 (Week 6)

- Team up, figure out the objectives of the project.

### Week 2 (Week 7)

- Discussion of the topic to pick, start the process of background motivation, visualization purpose, team schedule, and Data source.

### Week 3 (week 8)

- Group stand-up, start the coding with the implementation of D3 chart.
- Start the data processing.

### Week 4 (Week 9)

- Continue with the implementation of the website which includes the d3 chart, animation, interactivity of the website.

### Week 5 (Week 10)

- Complete the data processing.
- review the data and investigate how to find or method to fill the NA (Not available) value.
- Complete the structure of the website.

### Week 6 (Week 11)

- Continue with constructing bar chart, pie chart, and line chart.

### Week 7 (Week 12)

- Finish the website.
- Finish Process book.

# Data

## Data Source

The project uses OECD (Organization for economic cooperation and development) statistics as a primary data source. The main data in the project is referred to fig.1:

[https://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics/oecd-health-data-non-medical-determinants-of-health\\_data-00546-en?parentId=http%3A%2F%2Finstance.metastore.ingenta.com%2Fcontent%2Fcollection%2Fhealth-data-en](https://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics/oecd-health-data-non-medical-determinants-of-health_data-00546-en?parentId=http%3A%2F%2Finstance.metastore.ingenta.com%2Fcontent%2Fcollection%2Fhealth-data-en)

			Country	Australia							
			Year	2014	2015	2016	2017	2018	2019	2020	
				▲▼	▲▼	▲▼	▲▼	▲▼	▲▼	▲▼	
Variable		Measure									
Tobacco consumption ⓘ	Tobacco consumption ⓘ	Grams per capita (15+)		830.8	790	756.1	677.3	647	690.5	549.3	
		Cigarettes per smoker per day		..	..	13.4	..	..	..	12.9	..
		% of population aged 15+ who are daily smokers		..	..	12.4	..	..	..	11.2	..
		% of females aged 15+ who are daily smokers		..	..	10.8	..	..	..	10	..
		% of males aged 15+ who are daily smokers		..	..	14	..	..	..	12.4	..
		% of population aged 15-24 years old who are daily smokers		..	..	9.1	..	..	..	7.5	..
		% of females aged 15-24 years old who are daily smokers		..	..	8.3	..	..	..	6.4	..
		% of males aged 15-24 years old who are daily smokers		..	..	9.8	..	..	..	8.5	..
Alcohol consumption ⓘ	Alcohol consumption ⓘ	Litres per capita (15+)		9.7	9.8	9.5	9.5	..	..	..	
Food supply and consumption ⓘ	Total fat supply ⓘ	Grams per capita per day		158.2	159.5	160.7	159	160.6	160.9	155.7	
	Total calories supply ⓘ	kilocalories per capita per day		3 413	3 401	3 426	3 404	3 395	3 436	3 422	
	Total protein supply ⓘ	Grams per capita per day		107.8	108.2	109	106.7	107.8	110.9	114.9	
	Sugar supply ⓘ	kilos per capita per year		43.9	42.5	44.1	43.3	41.7	41.2	41.2	
	Vegetables supply ⓘ			86.7	90	93.5	94	89.9	86.2	81	
	Fruits supply ⓘ			71	70.8	76.8	75.4	70.6	65.5	71.1	
	Vegetables consumption, daily (survey) ⓘ	% of females aged 15 years old and over		(D)	99	..	..	(D)	99.4	..	..
		% of males aged 15 years old and over		(D)	99	..	..	(D)	99	..	..
		% of population aged 15 years old and over		(D)	99	..	..	(D)	99.2	..	..
	Fruits consumption, daily (survey) ⓘ	% of females aged 15 years old and over		(D)	96	..	..	(D)	96.1	..	..
		% of males aged 15 years old and over		(D)	93	..	..	(D)	93.4	..	..
% of population aged 15 years old and over			(D)	95	..	..	(D)	94.8	..	..	

(Fig. 1 OECD non-medical determinant of health dataset)

From the source dataset, the teams' main objectives are to present the visualization of tobacco, in other words, cigarette and alcohol consumption. However, when extracting data value to the dataset, huge numbers of data are missing (present as Not Available). Therefore, although by find the NA via mean, mode, or median value of the dataset could solve the issue. Yet the overall presentation of the data will not be precise nor accurate. Hence during the development of the project, the group used the OECD dataset as a reference and explored further resources relevant to the project objective. Ultimately, the team managed to find external dataset sources with richer content from the Australian Institute of Health and Welfare, known as AIHW an acronym shown in fig.2 and fig.3.

Table 4.2: Alcohol drinking status, people aged 14 and over, by gender, 2001 to 2022–2023 (col per cent)

Drinking status	Proportion																								Persons
	Males																Females								
	2001	2004	2007	2010	2013	2016	2019	2022–2023	2001	2004	2007	2010	2013	2016	2019	2022–2023	2001	2004	2007	2010	2013	2016	2019	2022–2023	
Daily	11.3	12.3	10.9	9.8	8.7	7.7	6.9	6.7	5.7	6.0	5.7	5.0	4.7	4.3	3.9	3.7	8.5	9.1	8.3	7.4	6.7	6.0	5.4	5.2	
Weekly	45.9	48.1	46.9	45.4	43.8	41.1	40.6	40.4	33.0	35.4	36.2	34.2	32.0	31.3	29.4	32.1#	39.3	41.7	41.5	39.7	37.8	36.1	34.9	35.9	
Monthly	19.0	17.7	17.5	18.2	19.1	19.6	19.4	17.6#	23.2	22.4	21.3	21.8	21.7	21.7	22.7	20.3#	21.1	20.1	19.4	20.0	20.4	20.6	21.1	18.9#	
Less often than monthly	10.8	9.6	10.7	10.0	10.3	11.7	12.2	13.9#	18.4	17.2	16.8	16.4	17.9	18.1	18.3	19.7#	14.6	13.5	13.8	13.3	14.1	15.0	15.2	16.9#	
Ex-drinker <sup>(a)</sup>	5.9	5.4	5.8	6.7	6.2	6.8	8.1	7.3	8.3	7.3	8.0	8.4	7.5	8.3	9.8	9.1	7.1	6.3	6.9	7.6	6.9	7.6	8.9	8.2#	
Never a full glass of alcohol	7.2	6.9	8.2	9.9	11.9	13.0	12.8	14.2	11.4	11.7	12.1	14.2	16.2	16.3	15.9	15.1	9.3	9.4	10.1	12.1	14.0	14.7	14.4	14.9	

# Statistically significant change between 2019 and 2022–2023.

(a) Consumed at least a full serve alcohol, but has not had an alcoholic drink in the previous 12 months.

Source: NDHS 2022–2023

Drinking status	RSE																								Persons
	Males																Females								
	2001	2004	2007	2010	2013	2016	2019	2022–2023	2001	2004	2007	2010	2013	2016	2019	2022–2023	2001	2004	2007	2010	2013	2016	2019	2022–2023	
Daily	2.9	3.0	3.5	3.2	3.5	3.7	4.1	4.4	4.2	3.8	4.3	4.2	4.8	4.8	5.4	5.1	2.5	2.4	2.7	2.5	3.0	3.0	3.4	3.5	
Weekly	1.3	1.3	1.5	1.4	1.5	1.6	1.7	1.7	1.6	1.5	1.7	1.5	1.8	1.9	2.1	2.0	1.1	1.1	1.2	1.1	1.2	1.3	1.5	1.5	
Monthly	2.3	2.7	2.8	2.5	2.8	2.6	2.7	3.0	1.8	2.0	2.2	1.9	2.0	2.1	2.3	2.4	1.5	1.6	1.8	1.5	1.7	1.6	1.8	1.9	
Less often than monthly	3.4	3.9	4.1	3.6	3.7	3.5	3.5	3.6	2.2	2.4	2.7	2.3	2.3	2.3	2.5	2.6	1.9	2.1	2.3	2.0	2.0	2.0	2.1	2.2	
Ex-drinker <sup>(a)</sup>	4.3	4.6	5.6	4.3	4.6	4.2	4.3	4.5	3.4	3.6	3.8	3.3	3.6	3.7	3.5	3.9	2.7	2.9	3.3	2.8	3.0	2.9	2.8	3.1	
Never a full glass of alcohol	4.6	5.3	5.6	4.4	4.0	3.8	4.8	4.5	3.1	3.5	3.5	3.1	3.1	3.2	3.5	3.9	2.9	3.0	3.3	2.7	2.7	2.7	3.0	3.4	

Table 2.2: Tobacco smoking status, people aged 14 and over, by gender, 2001 to 2022–2023 (col per cent)

Smoking status	Proportion																								Persons
	Males												Females												
	2001	2004	2007	2010	2013	2016	2019	2022–2023	2001	2004	2007	2010	2013	2016	2019	2022–2023	2001	2004	2007	2010	2013	2016	2019	2022–2023	
Smoke daily	20.9	18.7	18.0	16.4	14.5	13.8	12.2	9.0#	17.9	16.3	15.2	13.9	11.2	10.7	9.9	7.7#	19.4	17.5	16.6	15.1	12.8	12.2	11.0	8.3#	
Current occasional - weekly	2.1	2.0	1.4	1.8	1.8	1.6	1.6	1.3	1.4	1.2	1.2	1.2	1.0	1.1	1.2	0.8#	1.8	1.6	1.3	1.5	1.4	1.3	1.4	1.1#	
Current occasional - less than weekly	2.6	1.9	1.7	1.6	2.0	1.6	2.1	1.3#	1.5	1.3	1.3	1.2	1.2	1.1	1.1	0.9	2.0	1.6	1.5	1.4	1.6	1.4	1.6	1.1#	
Currently smoke <sup>(a)</sup>	25.7	22.6	21.2	19.7	18.3	17.1	15.9	11.6#	20.8	18.9	17.7	16.3	13.4	12.8	12.2	9.5#	23.2	20.7	19.4	18.0	15.8	14.9	14.0	10.5#	
Smoked previously <sup>(b)</sup>	29.6	29.3	27.9	26.3	26.0	24.1	25.2	26.2	22.9	23.6	22.4	21.8	22.2	21.6	20.7	22.3#	26.2	26.4	25.1	24.0	24.0	22.8	22.8	24.1#	
Smoked in their lifetime <sup>(c)</sup>	55.3	51.9	49.1	46.0	44.3	41.2	41.0	37.8#	43.6	42.5	40.2	38.2	35.5	34.4	32.9	31.8	49.4	47.1	44.6	42.1	39.9	37.7	36.9	34.6#	
Never smoked <sup>(d)</sup>	44.7	48.1	50.9	54.0	55.7	58.8	59.0	62.2#	56.4	57.5	59.8	61.8	64.5	65.6	67.1	68.2	50.6	52.9	55.4	57.9	60.1	62.3	63.1	65.4#	

# Statistically significant change between 2019 and 2022–2023.

(a) Includes people who reported smoking daily, weekly or less than weekly.

(b) Smoked at least 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco in their life, and reported no longer smoking.

(c) Includes people who reported smoking daily, weekly or less than weekly and people who previously smoked.

(d) Never smoked 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco.

Source: NDHS 2022–2023

DSF

(fig2. AIHW dataset source of alcohol drinking and tobacco smoking status)

Table 4.3: Alcohol drinking status, people aged 14 and over, by gender, 2001 to 2022–2023 (persons)

Estimated population																
Drinking status	Males								Females							
	2001	2004	2007	2010	2013	2016	2019	2022-2023	2001	2004	2007	2010	2013	2016	2019	2022-2023
Daily	300,000	1,000,000	900,000	300,000	600,000	800,000	700,000	700,000	500,000	500,000	500,000	500,000	500,000	400,000	400,000	400,000
Weekly	3,500,000	3,500,000	4,000,000	4,300,000	4,300,000	4,000,000	4,200,000	4,300,000	2,600,000	2,900,000	3,000,000	3,000,000	3,000,000	3,200,000	3,000,000	3,500,000
Monthly	1,500,000	1,400,000	1,500,000	1,600,000	1,800,000	1,900,000	2,000,000	1,900,000	1,800,000	1,800,000	1,800,000	2,000,000	2,000,000	2,200,000	2,400,000	2,200,000
Less often than monthly	800,000	800,000	900,000	900,000	1,000,000	1,000,000	1,000,000	1,500,000	1,500,000	1,400,000	1,500,000	1,500,000	1,700,000	1,600,000	1,500,000	1,500,000
Ex-drinker <sup>(a)</sup>	500,000	400,000	500,000	600,000	600,000	700,000	800,000	800,000	700,000	700,000	700,000	800,000	700,000	800,000	1,000,000	1,000,000
Never a full glass of alcohol	500,000	600,000	700,000	900,000	300,000	1,300,000	1,300,000	1,500,000	900,000	1,000,000	1,000,000	1,300,000	1,600,000	1,700,000	1,700,000	1,700,000

Table 2.3: Tobacco smoking status, people aged 14 and over, by gender, 2001 to 2022–2023 (persons)

Smoking status	Estimated population																Persons
	Males								Females								
	2001	2004	2007	2010	2013	2016	2019	2022-2023	2001	2004	2007	2010	2013	2016	2019	2022-2023	
Smoke daily	1,600,000	1,500,000	1,500,000	1,500,000	1,400,000	1,400,000	1,300,000	1,000,000	1,400,000	1,300,000	1,300,000	1,300,000	1,000,000	1,000,000	1,000,000	800,000	800,000
Current occasional - weekly	200,000	200,000	100,000	200,000	200,000	200,000	200,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	90,000	90,000
Current occasional - less than weekly	200,000	200,000	100,000	100,000	200,000	200,000	200,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Currently smoke <sup>(b)</sup>	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Smoked previously <sup>(b)</sup>	2,300,000	2,300,000	2,300,000	2,400,000	2,400,000	2,400,000	2,400,000	2,400,000	2,300,000	2,300,000	2,300,000	2,300,000	2,300,000	2,300,000	2,300,000	2,400,000	2,400,000
Smoked in their lifetime <sup>(c)</sup>	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000	4,300,000
Never smoked <sup>(b)</sup>	3,400,000	3,000,000	4,300,000	4,800,000	5,200,000	5,800,000	6,300,000	6,800,000	4,500,000	4,700,000	5,200,000	5,700,000	6,200,000	6,800,000	7,300,000	7,500,000	7,500,000

(a) Includes people who reported smoking daily, weekly or less than weekly.

(b) Smoked at least 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco in their life, and reported no longer smoking.

(c) Includes people who reported smoking daily, weekly or less than weekly and people who previously smoked.

(d) Never smoked 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco.

Source: NDHS 2022–2023

(fig.3 AIHW dataset source of population of Australia smoking and drinking status between male and female)

## Data Clean Up

During the data cleanup process, what is crucial is to remove unneeded data to keep the data table optimize for efficient coding. Thus, in the tobacco smoking status dataset from Fig. 2. The team decided to remove the 'currently smoke' and 'smoked in their lifetime' because it doesn't contribute to a clear visual presence. The team figures these kinds of 'combination' type data could drag down the preciseness of the data visualization as it could cause the individual data point to be uncertain as well as complicating the data integration.

The second chart focuses on the population proportion of the different statuses of smoking and alcohol consumption between males and females. The original dataset also includes the RSE (relative standard error) type of population. The team decided to remove the data between 2001 to 2013 to simplify the data visualization graph length and analysis. As well as remove the RSE type because it required to understanding of standard error and statistical concepts, which are not user-friendly to visitors after export to visualize the graph. In contrast with the proportion type data, it is more straightforward to understand as they present a percentage of the whole.

## Data Processing

As the data visualization purpose mentioned, the team has a clear objective with constructing three following charts to provide clear visualization of the topic from each different characteristic.

### Line chart

- Method of collection:

The data is taken from OECD dataset. Data from the table is put collectively of numerical data used for the visualization, which is then presented through visualization in numerical (ordinal) and numerical (ratio) data.

### Pie chart

- Method of collection

The data is taken from AIHW spreadsheet table 2.2 and 4.2. Data from the table is composed with categorical/numerical data used for the visualization, which is then presented through visualization in through categorical (nominal) and numerical (ratio) data.

### Bar chart

- Method of collection

The data is taken from AIHW spreadsheet table 2.3 and 4.3. data. Data from the table is put collectively of categorical used for the visualization.



## Filling NA (Not Available) Value Gap

According from fig.4 the data set from the OECD graph, the missing value starts occurring in the later year. Therefore, the team decided to replace NA values with the mean value of the dataset as it is a straightforward approach that maintains the dataset's "overall central tendency" (Duxburry Press, 1999). Using the mean helps ensure that the data remains balanced, allowing for more accurate analysis and predictions. In contrast, replacing NA values with the median does not utilize all data points, potentially leading to less precise estimation. Using the mode can be useful for categorical data but may not be suitable for continuous data, as it can lead to oversimplification and may not accurately represent the dataset's divergence.

A	B	A	B
Year	Australia	Year	Australia
2014	9.7	2014	9.7
2015	9.8	2015	9.8
2016	9.5	2016	9.5
2017	9.5	2017	9.5
2018		2018	9.6
2019		2019	9.6
2020		2020	9.6

(fig.4 Empty value refill with the mean value of the dataset)

# Website Requirement

## Website required features

### Statistic graph (Bar chart)

- To discrete the contrast of two different groups in one category.
- Highlighting Differences: Display the difference between the two groups, such as higher or lower consumption rates.

### Graph (Line chart)

- To display the trend of the flow, visualize and display the increase or decrease of the trend
- By using line connecting datapoint. It could best present the pattern and figure out changes in timeline.

### Graph (pie chart)

- To display the clear portion of each group in the category
- Visually demonstrates the relative sizes of smoking and alcohol consumption groups, making it easy to see which group is larger

## Optional features

- Animation of data visual line transition: Enhance the interactive of the visual line graph.
- Hover the mouse on any bar in the bar chart and display the number.

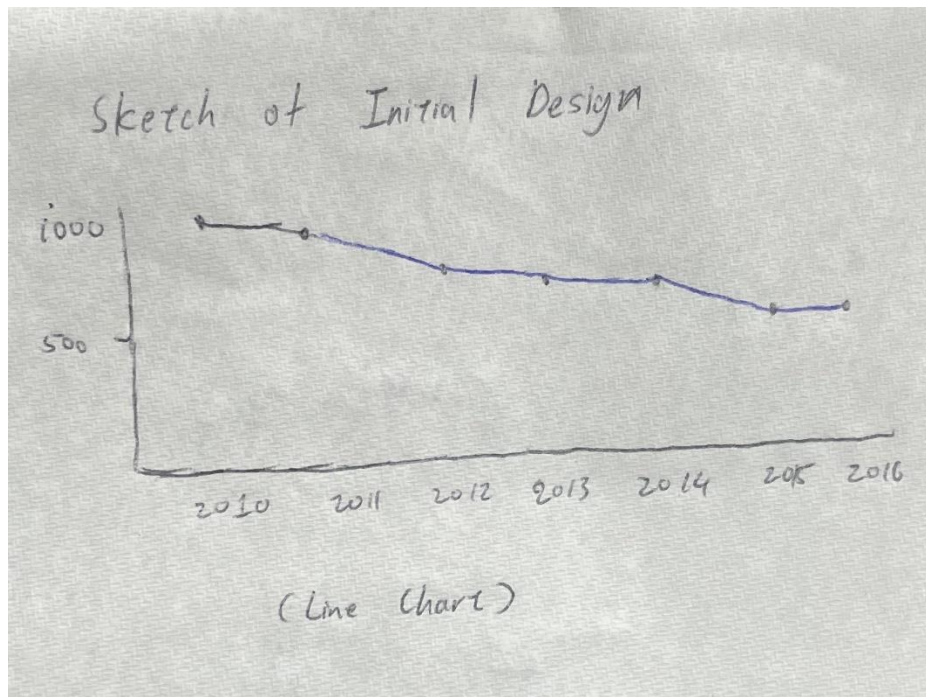
# Visualization design

## Initial idea designs

Whenever designing the visualize of graph on the website, it is crucial to understand that each graph usually correspond to a specific question or purpose. Hence the team came up with a few graphs type with clear subject to demonstrate the goal of each graph and the design purpose.

### The trend of average consumption alcohol and tobacco of person over year (Line chart)

Question 1: What is the average consumption per person in a year?

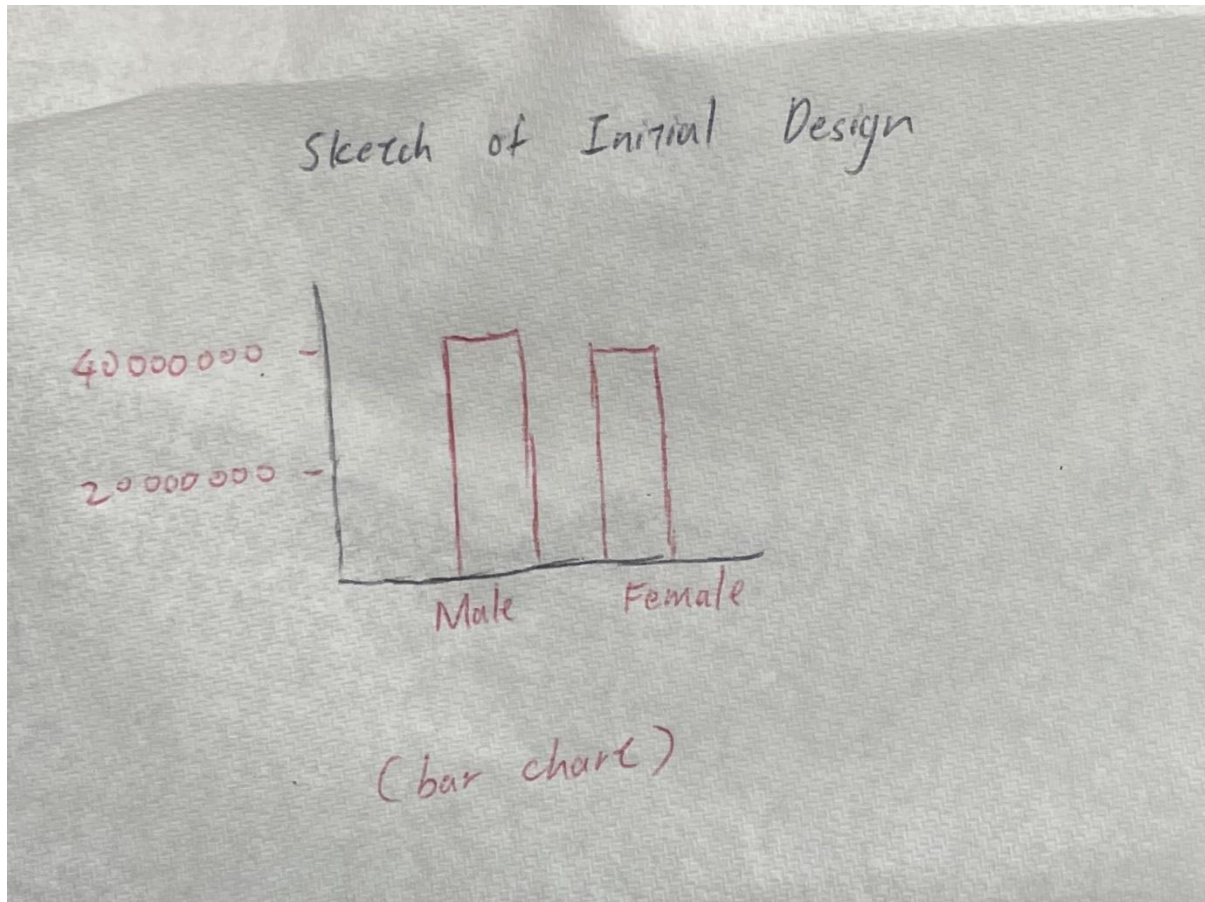


(Fig.5.1 Sketch of Line chart)

- The primary design of the line graph is to indicate the average tobacco and alcohol consumption per person over the year.
- There will be two individual line chart for each corresponding item.
- The x-axis represents the year, and the y-axis represents the quantity consumed over the year.

## The population of consuming alcohol and tobacco between male and female (Bar chart)

Question 2: How do the rates of tobacco and alcohol use compare between male and female groups?



(Fig 5.2.Sketch of Bar chart)

- The bar illustrates the number of populations consuming alcohol or tobacco between male and female group.
- The x-axis stands for each discrete group which is male and female, and the y-axis stands for the number of populations who smoke or drink matter currently or previously.
- The design will specify the year of this data visualize statistic occurs.

For example:

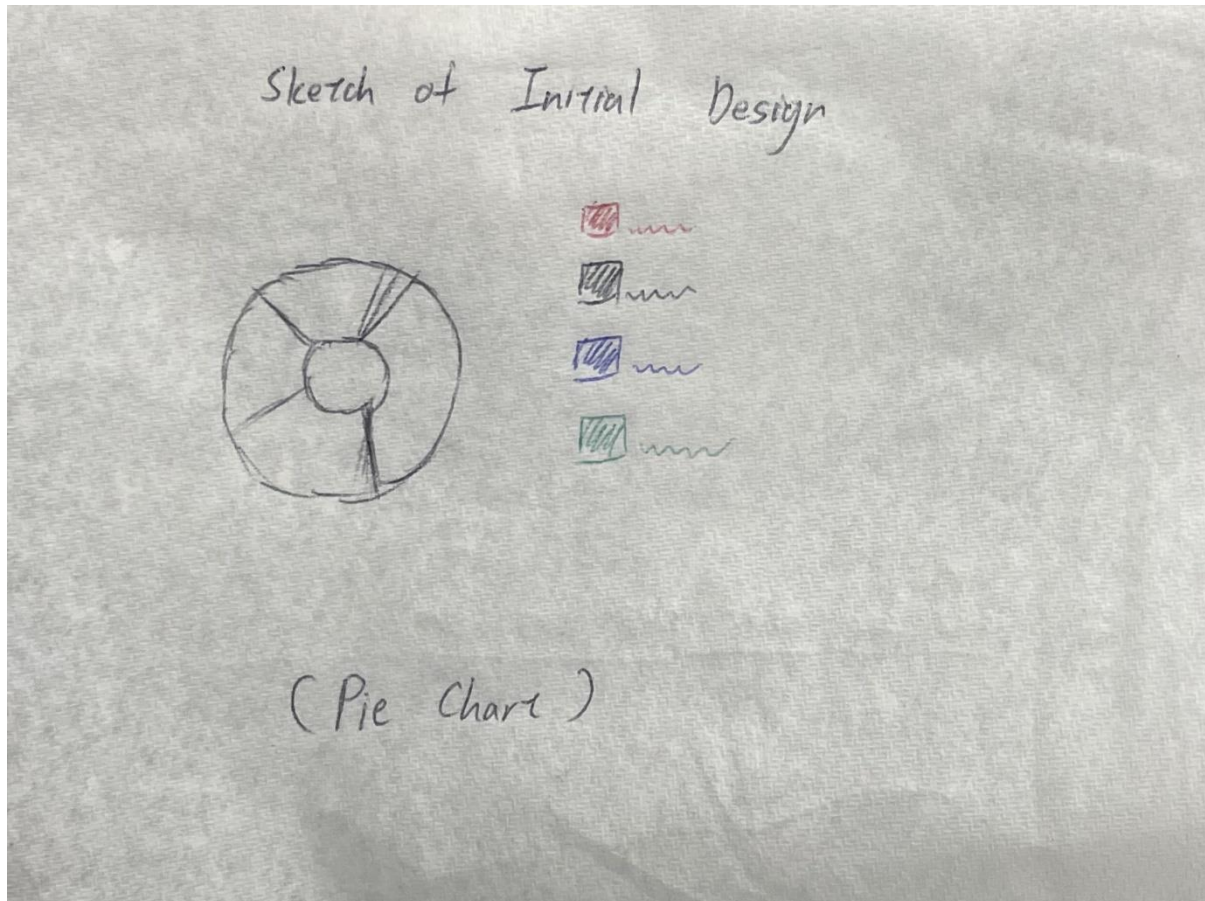
-2016

-2019

-2022

The portion percentage of group consuming alcohol or tobacco (pie chart)

Question 3: What is the percentage of the status that consumes tobacco or alcohol?



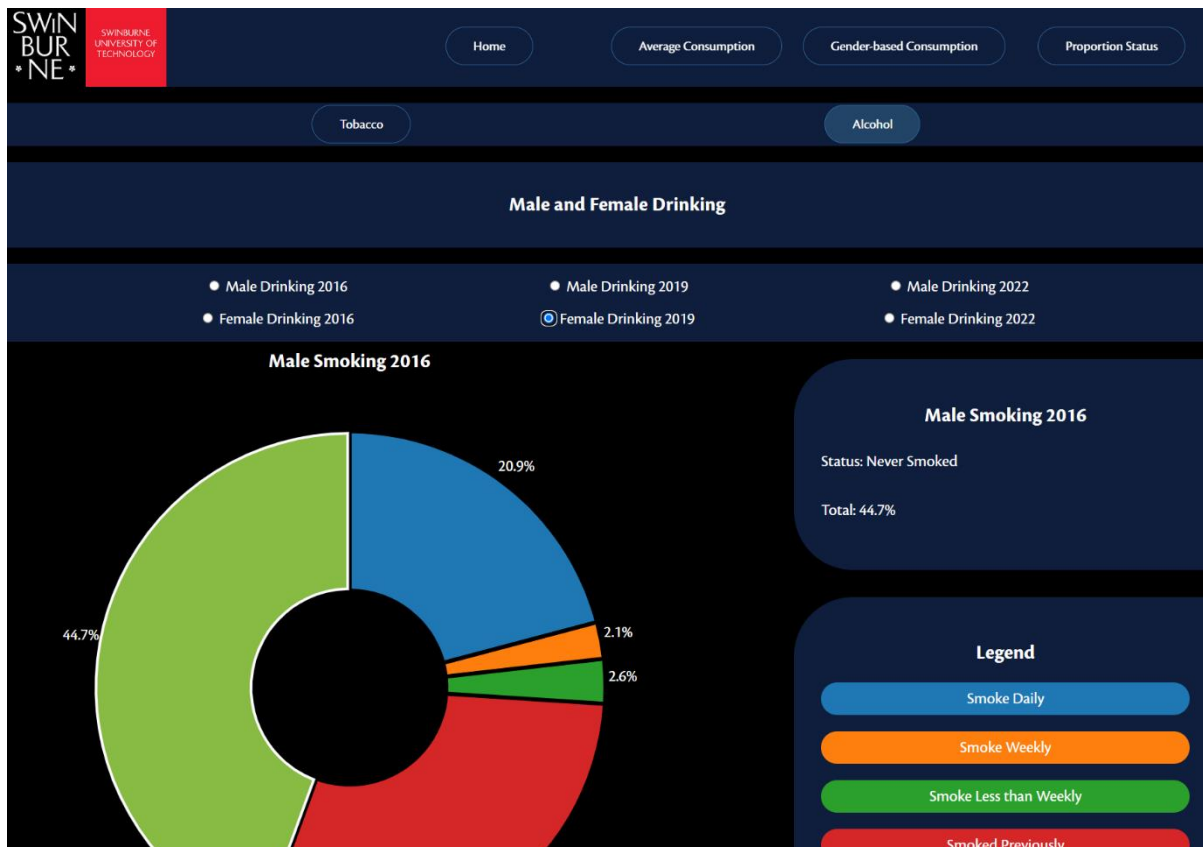
(Fig.5.3. Sketch of Pie chart)

- The pie chart illustrates the percentage of the status of consuming alcohol or tobacco between male and female group
- The status include:
  1. Daily
  2. Weekly
  3. Monthly
  4. Smoked previous
  5. Never smoked
- Like the bar chart, the design will specify the year of data visualization.

## Evolution of Design

As the teams' iteration reaches to final phase. Based on the validation of feedback and usability (Which will be talked about later). The design of the web page has the following enhance:

Screen shot of final design:

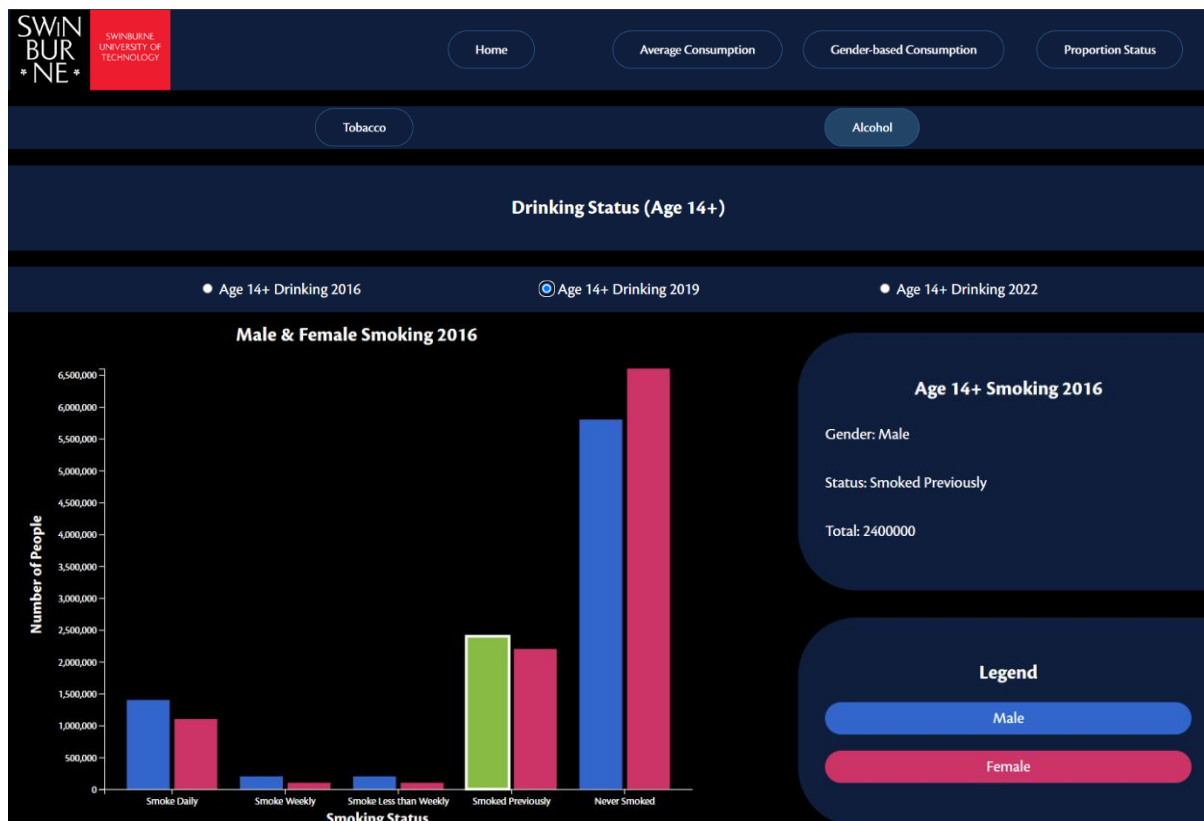


(Fig 6.1. Pie chart Enhancement)

Pie chart:

- On the side of the chart, the team added the legend to avoid confusion about the group status name.
- The pie chart was designed to enhance the user interaction with the graph by changing the color of the specific pie that the mouse is hovering on. The effect could potentially help the user to stay on track to focus on which group.
- On the third top of the navigation bar. The team added a couple more charts of different year periods with gender-based differences. The use of a ratio button increases the interactivity between the user and the visual graph.

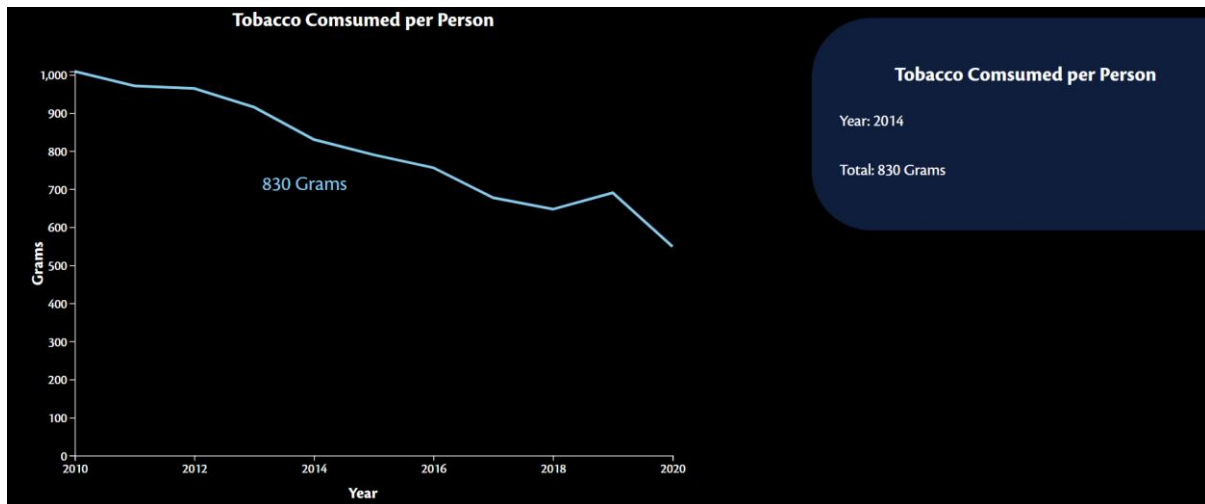




(Fig 6.2. Bar chart enhancement)

Bar Chart:

- Similar features like pie chart. On the side of the bar chart add the legend.
- The bar chart graph also has the hovering effect and on the side right on top of the legend will display the number of the population who had or have smoked or drunk alcohol.
- On the third top of the navigation bar. Different periods of the chart are also added to see the contrast of the consumption level in different periods.



(Fig. 6.3 Line chart Enhancement)

#### Line Chart:

- The line chart design is enhanced with mouse hover and displays the value in the nearest point which enhances the user interactivity with the visual graph



## Justification of the coding design

### Line chart:

- The decision to put the value under the point when the user hovers the mouse over the nearest point helps the user to pinpoint people in a year consume an average specific value of alcohol or tobacco.
- The use of the side next to the chart assists the user in tracking the specific year and reminds of the value that the user hovers the nearest. The coding effect supports viewers in tracking with simple understanding as well as effectively communicating with the viewers.

### Bar chart

- Changing the color of the mouse hovering from lime green to coral pink. The high attention-grabbing remained with no change, yet the warm color maintained the reader's visual experience pleasant without potentially hurting viewers' eyesight. The visual encoding guides the viewer to track the pie status data with clear and easier attention. Ultimately to achieve which line chart effect has.

### Pie chart

- like the above, the pie chart has the same feature as the bar chart to keep the viewer on track with the specific data value they are viewing. The sidebar also displays the status type with the total percentage of this status.

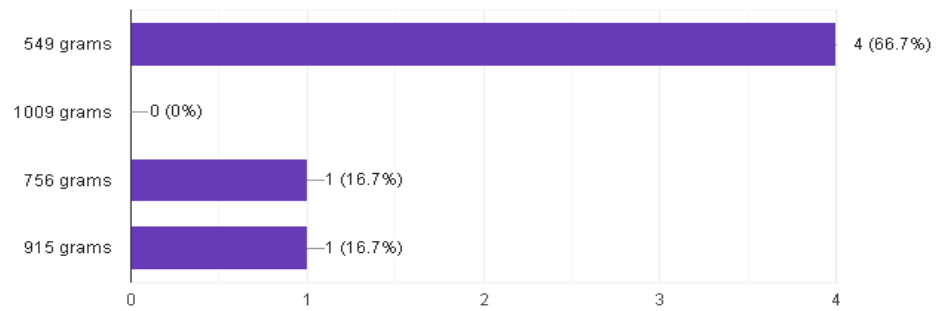
## Validation

The user rating assessment came up with 6 different responses to the following questions with figures as evidence.

In average, how much grams of tobacco consume per person in 2020 ?

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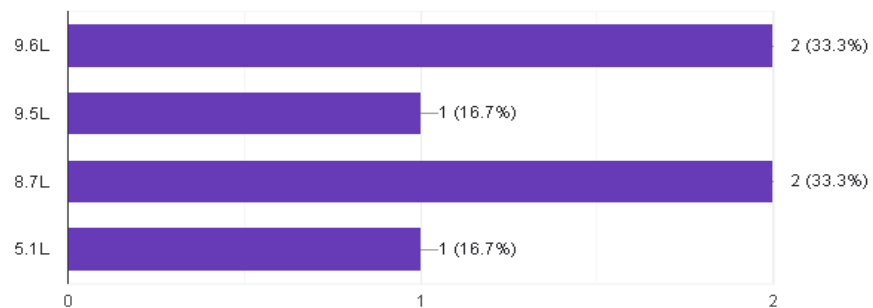
6 responses



In average, how many litres of alcohol consume per person in 2020 ?

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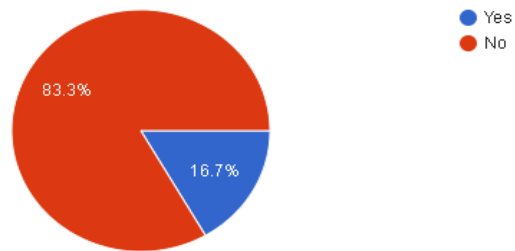
6 responses



Do you think is there too much inconsistency in this system?

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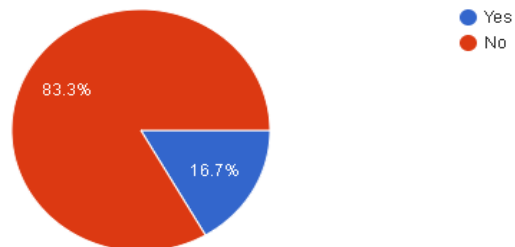
6 responses



Do you think the website need a guide?

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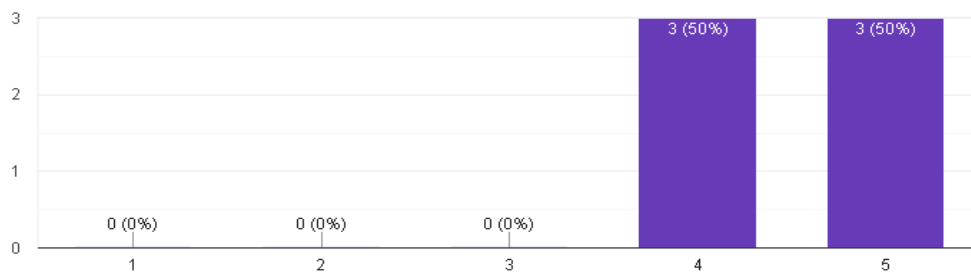
6 responses



Please rate the website usability

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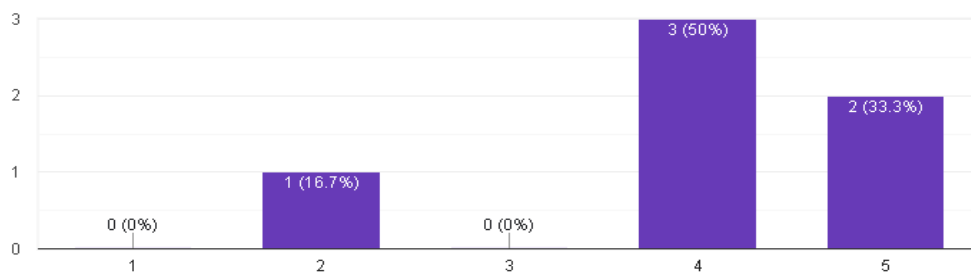
6 responses



Is the website easy to understand? e.g: In terms of easy to use and no complex.

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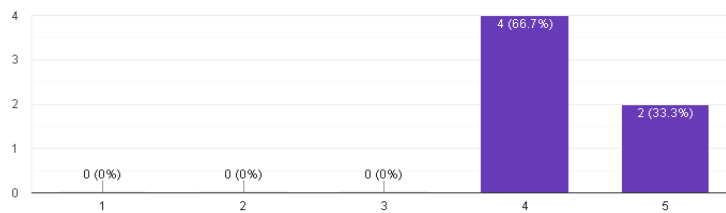
6 responses



## Rate the visualization interactivity features

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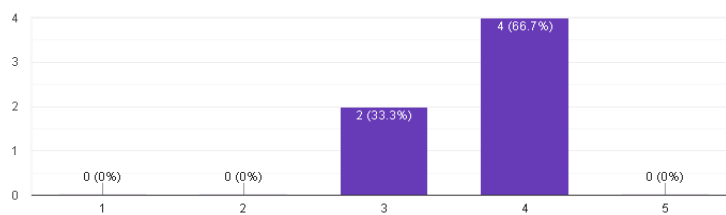
6 responses



## Rate the design of the website and visualization

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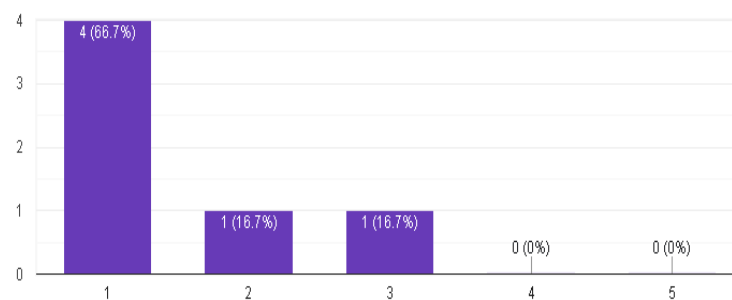
6 responses



## Is the website too complex to use and understand?

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6 responses



Ultimately, with the yielded practical data, the response proposes the website exists with the inconsistency of the page format. Besides the graph page format may slightly differ from the index page.

The on-page elements such as images, heading, colour theme, and background images. Another potential factor such as the level of interactivity could potentially as mainly cause of why the rating drop-down. On the other hand, the response also suggests that the website rating toward positive and user-friendly. The data could be used as a reference in the future iteration of the website to offer better productive method of visualization.

## Conclusion

Ultimately, the project aimed to visualize the consumption patterns of tobacco and alcohol to raise awareness about their health impacts. The team developed clear and instructive visualizations by leveraging datasets from the OECD and AIHW to aid various stakeholders, such as policymakers and healthcare professionals. These visualizations included line charts to track consumption trends over time, bar charts to compare consumption between males and females, and pie charts to show the relative proportions of different consumption statuses. The process involved proper data cleaning and processing, including filling in missing values with the mean to maintain overall data balance. This approach ensured a consistent dataset, smoothing accurate analysis, and predictions. The need to provide answers to inquiries concerning consumption patterns, like trend identification, gender group comparisons of the level of consumption, and understanding of consumption proportions. Despite some challenges, such as handling missing data and ensuring the accuracy of visual representations, the project was achieved in its primary goal. The visualizations provided a clear, easy way to understand complex data, enhancing public awareness and informing stakeholders about the potential health risks associated with tobacco and alcohol consumption. Additionally, user feedback highlighted areas for improvement, such as the need for more consistent page formatting and enhanced interactivity, which will be valuable for future website iterations. Overall, this project demonstrated clear data visualization via the concept of applying the programming technique of d3 JavaScript to export the message of important health information and engage diverse audiences.

## References

OECD library, non-medical determinant of health, Available at: [https://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics/oecd-health-data-non-medical-determinants-of-health\\_data-00546-en?parentId=http%3A%2F%2Finstance.metastore.ingenta.com%2Fcontent%2Fcollection%2Fhealth-data-en](https://www.oecd-ilibrary.org/social-issues-migration-health/data/oecd-health-statistics/oecd-health-data-non-medical-determinants-of-health_data-00546-en?parentId=http%3A%2F%2Finstance.metastore.ingenta.com%2Fcontent%2Fcollection%2Fhealth-data-en) (Accessed at: 24/ 04/2024)

Australian Institute of Health and Welfare, National Drug Strategy Household Survey 2022–2023, Available at: <https://www.aihw.gov.au/reports/illicit-use-of-drugs/national-drug-strategy-household-survey/data> (Accessed at: 24/ 04/2024)

Faculty Washington(1999),Available at: <http://faculty.washington.edu/swithers/seestats/SeeingStatisticsFiles/seeing/center/meanvmedian3.html> (Accessed at: 12/05/2024)

Laerd, Measures of Central Tendency(2018), Available at: <https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php> (Accessed at: 17/05/2024)

Stackflow, D3.js donut chart... arc.centroid(d) is not influenced by d.innerRadius and d.outerRadius (2013), Available at: <https://stackoverflow.com/questions/16062257/d3-js-donut-chart-arc-centroidd-is-not-influenced-by-d-innerradius-and-d-ou> (Accessed at: 25/05/2024)

D3-graph-gallery, Interactive pie chart with input data selector , Available at: [https://d3-graph-gallery.com/graph/pie\\_changeData.html](https://d3-graph-gallery.com/graph/pie_changeData.html) (Accessed at: 25/05/2024)