SWINBURNE UNIVERSITY OF TECHNOLOGY

Hawthorn Campus

BACHELOR OF COMPUTER SCIENCE

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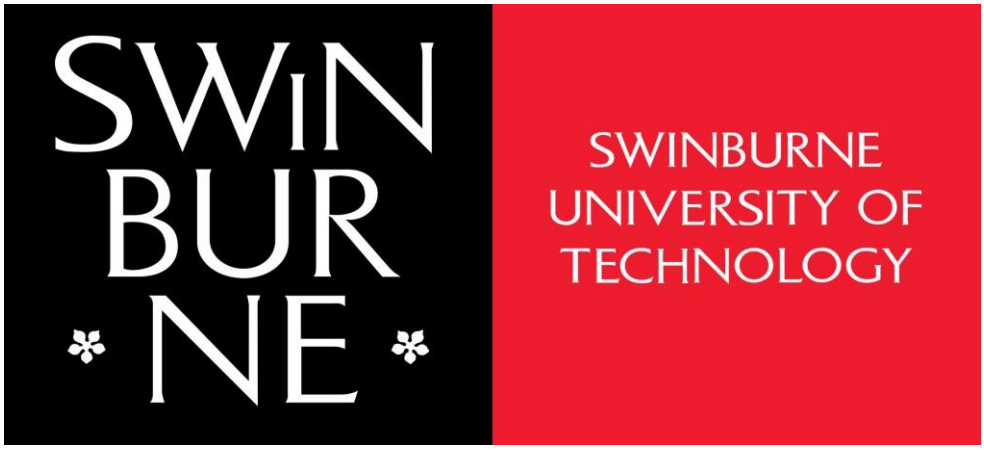
COS30045 – Data Visualisation



Project Stand Up 1 Visualising Drug Testing Enforcement in Australia: A State-by-State Analysis Team Name: CL01_G21 Name – Yulan Yaneth Karunanayake ID - 105107919

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1. Introduction

1.1. Background and Motivation

Among the many users of this drug testing dashboard are law enforcement organizations, legislators, and members of the public, especially those who are worried about traffic safety and the dangers of driving while intoxicated. Legislators rely on high-level insights to evaluate the efficacy of present enforcement tactics, while police and enforcement agencies need precise data to pinpoint areas that need additional focus. Additionally, the public has a better understanding of the various drug testing procedures used by the states, which contributes to increased awareness and safer driving practices throughout Australia. Because drug-related accidents are on the rise, roadside drug tests are being used more frequently. The visualisation emphasises the need for easily accessible, trustworthy data that shows where tests are conducted and the results they provide.

This dashboard focuses on the increasing number of drivers who test positive for drugs while driving, which poses a serious risk to road safety. The dashboard gives stakeholders crucial information: the number of tests being performed, the percentage of positive findings, and how these numbers change over time between jurisdictions as the government responds by expanding roadside testing. Users can engage with the dashboard in order to:

- See how many roadside drug tests are performed annually or by state.
- Data can be filtered by detection technique, jurisdiction, and year.
- Examine the favorable outcome rates in various jurisdictions and years.
- Examine patterns in the number and results of drug tests.

1.2. Visualisation Purpose

This visualization's main goal is to give users the ability to investigate and assess the efficacy and uniformity of roadside drug testing throughout Australia. The dashboard is intended for a variety of users, each of whom interacts with the data in accordance with their own requirements. It can be used to track the number of tests carried out in different areas and spot possible reporting problems for law enforcement. Legislators can evaluate the effectiveness of the current drug testing systems and determine whether changes to the law or public awareness initiatives are required. The dashboard provides the general public with a useful tool for research or for spreading knowledge about initiatives to increase road safety. Through the integration of interactive features and a clear visual style, the dashboard converts raw data into a visually accessible format that is easy to comprehend.

- In altogether, how many drug tests are performed in each state each year?
- In what percentage of these tests do the results come back positive?
- How have the numbers of drug tests and their results changed over time?
- What is the most prevalent stage at which positive test results are found?

To ensure that the dashboard stays relevant and serves a purpose, these questions are carefully crafted to meet the various demands of each user group. Users may effectively explore enormous datasets and extract valuable insights because to its user-friendly design and extensive filter choices, which include state, year, test type, and detection method. This degree of personalization not only improves usability but also helps professionals make well-informed decisions and increases public awareness.

2. Data

2.1. Data Source and Governance

The Road Safety Enforcement Data Dictionary from the Australian Government's Department of Infrastructure, Transport, Regional Development, Communications, and the Arts serves as the data source for this drug test dashboard visualization. Police from various states, including the following, gathered this dataset:

- NSW Police force
- Victoria Police
- Queensland Police Service
- South Australia Police Force
- Western Australia Police Force • Tasmania Police
- Northern Territory Police Force
- Australian Federal Police

The drug tests dashboard is primarily focused on the enforcement of roadside drug tests around Australia. It shows, according to the chosen year, the total number of drug tests performed, the proportion of positive findings, and the number of fines, arrests, and charges brought. To examine the data more thoroughly, users can filter it by year, testing stage, and jurisdiction.

The following testing phases are part of the 2023 dataset:

- Roadside testing (Indicator)
- Secondary confirmatory
- Not applicable

Among the 471,217 drug tests performed in 2023, 11.4% had positive findings. For that year, the visualization also shows 28,716 charges, 210 arrests, and 12,784 penalties. The dataset is updated frequently; the most recent change was made on February 21, 2025.

Age group, substance type, detection method, remoteness areas, and monthly-level detail are among the new data categories that were added in 2023. The Australian BITRE incorporates all three testing steps as of 2023, despite the fact that none of them were previously documented in previous datasets. The analysis only considers records that have BEST_DETECTION_METHOD = "Yes" in order to preserve data accuracy and prevent duplication (because a single test may span numerous phases).

Attribute (2023)	**Description**
Complete drug test	471,217
Drug test result that is positive	11.4%
Fines issued	13,784
Charges	28,716
Arrests	210
Testing stages	Indicator, Laboratory, Not applicable
Filters	Jurisdiction, Year, Testing stage
Drug test conducted and result overtime	From 2008 to 2023 with steady increase
Tests per 10,000 licences	Highest in SA (392), lowest in ACT (31)
Update frequency	Annually

Data Collection Process

This dashboard's dataset is created using police enforcement records that have been supplied by different states and territories. Jurisdictions have been obliged since 2023 to incorporate more specific fields in their submissions, like testing sites and methodologies, in order to enhance the completeness and accuracy of the data. Oral fluid samples taken at the roadside provide the majority of the data used in drug tests. Up to three testing phases are frequently applied to these samples. Data on the overall number of drug tests performed, the proportion of positive findings, and enforcement outcomes— such as charges, penalties, and arrests—are reported by each jurisdiction.

Data Quality Assessment

Many jurisdictions offered comprehensive datasets, but some did not because of gaps or discrepancies in the data. Due to quality concerns, the Northern Territory, for instance, did not submit data on the total number of drug tests, positive findings, arrests, or charges in 2023; instead, they only reported the amount of penalties that were imposed. Likewise, governments such as Victoria and Tasmania excluded enforcement measures like fines, arrests, or prosecutions and merely disclosed the quantity of drug tests performed and the proportion of positive results. On the other hand, New South Wales provided a dataset that was largely comprehensive, albeit it was devoid of arrest data. Similar to this, Queensland provided the majority of the information, with the exception of arrest and fine numbers.

Security, Privacy and Ethical Considerations

Jurisdiction, location, age group, year, start and end dates, detection method, types of substances found, and enforcement results, such as charges, arrests, and penalties, are among the fields included in the Positive Drug Tests dataset, which is sourced from the Road Safety Enforcement Data. However, as the data is fully aggregated (by year, state, "All ages," and "All regions"), no private or sensitive information is included, including names, test sites, or license numbers. (https://www.bitre.gov.au/publications/2024/road-safetyenforcement-data)

Individual privacy is not jeopardized by the dataset, despite the fact that it contains comprehensive insights such as drugs discovered and the corresponding

findings. To guarantee that all data is de-identified, broad labels like "All regions" and "All ages" are used in conjunction with binary indicators for drug detection techniques (Yes/No). Both ethical data handling and open public reporting are supported by this framework.

The dataset's primary privacy protections:

- Data is combined and made anonymous.
- There is no identifiable or personal information contained.
- Accessible to the general public without violating the privacy of those being tested

How The Data Supports the Visualization Purpose from section 1.2

The main topics listed in section 1.2 are directly supported by the dataset, which provides a clear and organized foundation. It contains crucial information including year, jurisdiction, testing stage, and the quantity of positive outcomes, allowing users to investigate important insights such:

- How many drug tests are performed in various states each year? Although a few states give complete testing data, others only supply partial data, which can make cross-state comparisons less reliable.
- To what extent do tests yield positive results?
  Test volume and positive result rates are frequently correlated. However, in many jurisdictions, the trustworthiness of full comparisons is impacted by incomplete reporting.
- In what ways has drug testing changed over time?

The dataset provides a glimpse of trends over time and covers the years 2008–2023. However, the clarity of the entire national picture is diminished by missing data from certain states or years.

- What is the stage of testing that produces the best results? Just the data from 2023 makes a distinction between testing stages like "Indicator" and "Laboratory." Comparing stages is still only partially possible because not all jurisdictions offered this degree of data.

To sum up, the dataset facilitates the investigation of patterns in roadside drug testing throughout Australia. However, one should exercise caution when interpreting the results because of the conflicting reporting from several jurisdictions.

2. 2 Data Processing and analysis

For the purpose of analyzing trends in roadside drug testing throughout Australia, the dataset includes a number of essential features. These contain jurisdictional

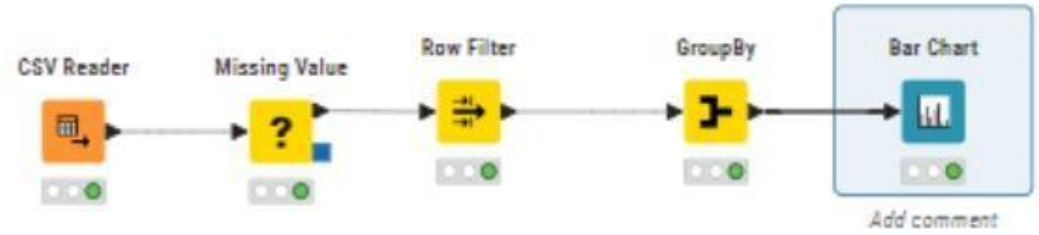
data, enforcement results, detection techniques, time-related fields, and drug types found. They are appropriate for a variety of visualisations, filters, and computed metrics because their properties are applicable to category, ordinal, and quantitative data types. These variables needed to be properly categorized, preprocessed, and transformed in order to guarantee useful analysis over time and across states.

Attribute	**Description**	**Data type**
YEAR	The drug test's recording year	Ordinal
START_DATE, END_DATE	The data's temporal range	Interval (Date)
JURISDICTION	The territory or state in which the exam was conducted	Categorical
LOCATION	Test's general region (all areas, for example)	Categorical
AGE_GROUP	Age range (for example, all ages, 17–25)	Ordinal
METRIC	The kind of measurement (positive_drug_tests, for example)	Categorical
BEST_DETECTION_METHOD	shows whether this is the most precise detecting technique.	Categorical (Yes/No)

DETECTION_METHOD	Phase of detection (Laboratory, Indicator, etc.)	Categorical
AMPHETAMINE, CANNABIS, COCAINE	types of substances examined for	Categorical (Yes/No)
NO_DRUGS_DETECTED	Was the outcome unfavorable?	Categorical (Yes/No)
COUNT	Count of drug tests that came out positive	Ratio (Quantitative)
FINES, ARRESTS, CHARGES	The quantity of corresponding enforcement results	Ratio (Quantitative)

KNIME was used to process and analyze the data to make sure it was clear, consistent, and prepared for visualization. The following important fields were recognized and categorized based on their data types: FINES, ARRESTS, CHARGES, YEAR, JURISDICTION, COUNT, BEST_DETECTION_METHOD, and DETECTION_METHOD. In order to prevent counting the same test more than once in successive stages, the dataset was filtered to only contain entries with BEST_DETECTION_METHOD set to "Yes."

For enforcement results in jurisdictions with missing data, missing values were addressed by either creating proxy totals using accessible variables or eliminating incomplete records from particular visualisations. To facilitate more transparent trend comparisons, further computed parameters were developed, including Year, Month formats and test rates per 10,000 licensed drivers. Consistent naming conventions for testing stages and jurisdictions were also ensured by applying data standardization techniques.



2.3 Data Exploration

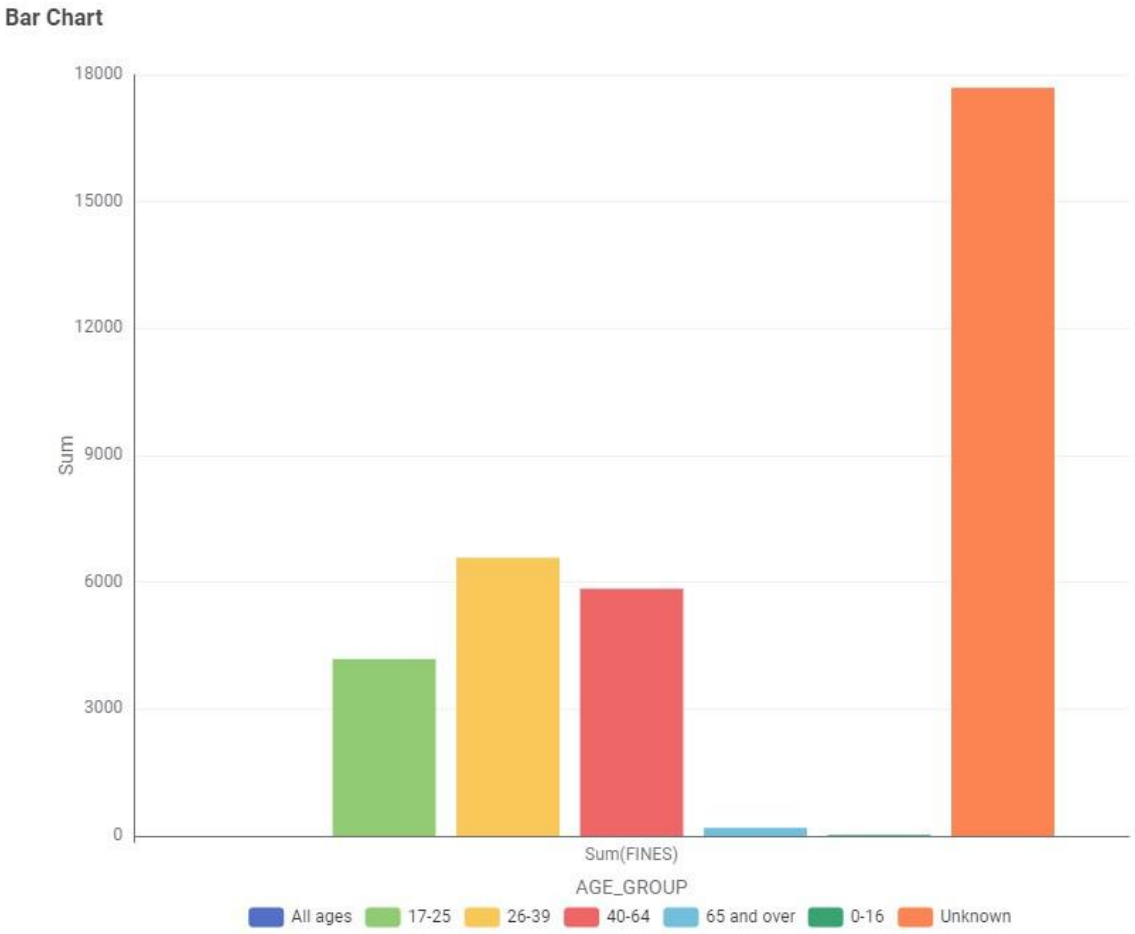


Illustration 0.0. The age groups 26–39 and 40–64 received the most fines, according to the bar chart, while the "Unknown" age group received the most.

Rows: 1 | Columns: 5 Table Statistics

#	RowID	YEAR Number (integer)	Sum(COUNT) Number (double)	Sum(FINES) Number (double)	Sum(CHARGES) Number (double)	Sum(ARRESTS) Number (double)
1	Row0	2023	92,875	34,526	47,080	210

- Drug test enforcement statistics from six countries in 2023 are compared in the table. New South Wales (NSW) had 40,551 drug tests, more than any other state. Queensland had 11,983 tests. With the highest number of fines (13,005) and charges (27,546), NSW also demonstrated a strong enforcement approach. However, because the Northern Territory and Tasmania did not provide comprehensive data for a number of enforcement outcomes, cross-state comparisons should be done with caution. Interestingly, South Australia registered a very high number of arrests (152), although conducting only 5,329 tests, indicating a clear operational focus or testing methodology.

#	RowID	JURISDICTION String	Sum(COUNT) Number (double)	Sum(FINES) Number (double)	Sum(CHARGES) Number (double)	Sum(ARRESTS) Number (double)
1	Row0	ACT	203	0	203	42
2	Row1	NSW	40,551	13,005	27,546	0
3	Row2	NT	573	573	0	0
4	Row3	QLD	11,983	0	11,983	0
5	Row4	SA	5,329	3,254	1,842	152
6	Row5	TAS	2,223	0	0	0

- This table presents the 2023 test results for the ACT and NSW by age group and location type (e.g., "Major Cities," "Inner Regional"). The age groups of 26–39 and 40–64 years old had 83 and 73 tests, respectively, in the ACT, indicating moderate levels of testing and charges as well as comparatively higher arrest rates. The 17–25 age group had a remarkably high number of tests (3,390) in NSW's Inner Regional
districts, and there were also notable enforcement outcomes (1,584 fines and 1,806 charges). This suggests that younger drivers may be more frequently targeted for testing or may be having higher positive test results in regional areas.

#	RowID	YEAR Number (integer)	JURISDICTI... String	LOCATION String	AGE_GROUP String	Sum(COUNT) Number (double)	Sum(FINES) Number (double)	Sum(CHAR... Number (double)	Sum(ARRES... Number (double)
1	Row0	2023	ACT	Major Cities of Au:	17-25	46	0	46	5
2	Row1	2023	ACT	Major Cities of Au:	26-39	83	0	83	22
3	Row2	2023	ACT	Major Cities of Au:	40-64	73	0	73	15
4	Row3	2023	ACT	Major Cities of Au:	65 and over	1	0	1	0
5	Row4	2023	NSW	Inner Regional Aus	0-16	21	6	15	0
6	Row5	2023	NSW	Inner Regional Aus	17-25	3,390	1,584	1,806	0

- Although the Exploratory Data Analysis (EDA) produced insightful findings, a number of difficulties were faced. These included incomplete enforcement outcome data from places like the Northern Territory, inconsistent reporting of testing stages, and an absence of geographic detail in previous datasets. A thorough examination of multi-phase testing methods was also limited because not all states provided results that were verified by laboratories. Notwithstanding these drawbacks, the analysis was successful in identifying significant enforcement hotspots, noteworthy demographic trends, and operational approach variations. These findings will all be taken into consideration when designing the dashboard and will help law enforcement agencies and policymakers make better decisions.

3.Visualization Design 3.1. Website Design

The goal of the drug test visualization website is to make complicated information easy to understand and useful for users. With a focus on usability, the website and dashboard's overall layout will be created to make it simple for users to explore important insights using distinct headings, filters, and visual components. Navigation will be smooth and easy thanks to the layout's vertical scrolling

structure, which guarantees accessibility on all devices, including desktops and smartphones.

A filtering bar at the top of the page will offer three important dropdowns to help customers navigate:

- Explore by Year: This feature makes it simpler to spot yearly trends by allowing users to filter and examine drug test data unique to a chosen year.

- Users can compare drug testing efforts across several locations by using the "Explore by Jurisdiction" feature, which enables them to filter results by state or territory.

- Testing Stages: Offers a summary of test results according to the testing stage (e.g., laboratory, roadside), with comprehensive stage-level data available beginning in 2023.

Every website visualization will adhere to a standardized and user-friendly design. The goal of each chart will be explained in a clear heading at the top. Users will be able to arrange data by year, jurisdiction, and testing stage using a filtering bar with dropdown menus below the title. Key statistics, like the overall number of drug tests performed and the positive test rate, will be shown in a summary section adjacent to the filters. A button labeled "Reset View" will enable users to rapidly revert to the standard country overview.

Clear and effective data exploration is ensured by this well-organized set of filters, visual signals, and succinct explanations.

- Users can interact with the data by choosing certain values for year, jurisdiction, and testing stage using a filtering bar at the top.

- Each chart has descriptive titles that give a clear context for the data being displayed.

- Data is presented in a visually appealing and educational manner using a variety of chart formats, such as pie charts, heat maps, bar charts, and line graphs.

- For transparency, a footer at the bottom of the website shows the date of the last update and includes a link to the original dataset.

PowerPoint was used to create a wireframe that showed the general layout of the webpage in order to support the visualization design. A navigation filter bar at the top, section headers, a highlight area for important information, and several chart sections for in-depth visualisations are some of the wireframe's essential elements. The goal of this layout is to provide the most important information quickly, followed by more detailed images that change based on the user's chosen filters, guaranteeing relevancy and clarity all the way through the user experience.

The storyboard depicts a normal user experience using the dashboard for visualizing drug tests. From the filter bar, users first choose filters like jurisdiction, year, or testing stage. The most recent dataset is used by the dashboard by default if no preference is made. Important indicators, such as the overall number of drug tests performed and the positive result rate, are automatically displayed in the section below once filters have been set.

A range of interactive visualisations are displayed to users as they scroll down the website, including:

- A **line chart** showing national drug testing trends over time
- A **heat map** highlighting test rates across states
- A **multi-line chart** comparing positive test rates between jurisdictions
- A **donut chart** illustrating drug tests per 10,000 driver licences by state

Notes describing the dataset and a download link to the original data are located at the bottom of the website. The general layout and interactive flow are intended to facilitate data exploration and make it simple for users to spot patterns and insights pertaining to drug enforcement in Australia. The dashboard is kept both readable and educational for all audiences thanks to its clear layout and unified style.

Drug Tests

Drug Tests Conducted	Positive Rate (%)	Reset view
0	0	

Select Jurisdiction
(Drop down list)

Select Year
(Drop down ist)

Select Testing Sta
(Drop down list)

Bar chart and Line chart which display drug tests conducted vs the positive resuit

Heat map that display the positive result by jurisdiction

Pie chart tat display the drug tests based per 10,000 driver licences by jurisdiction

Source / dataset
(which is downloadable)

Note about the data

3.2. Visualisation Design

In order to make it simple for users to examine and contrast drug testing patterns across jurisdictions, years, and testing phases, this visual design dashboard aims to display complex data in an understandable and engaging manner. The dashboard improves user comprehension by distilling complex data patterns into clear images, which also makes the analysis more approachable and significant. Different Chart Types and Their Uses

- A variety of chart formats intended to improve comparison and clarity will be available on the drug test dashboard:

- Key performance indicators (KPI), such the overall number of drug tests performed and the positive test rate, are displayed in KPI boxes. Depending on the filters that are selected (year, jurisdiction, testing stage, etc.), the values are updated dynamically, giving consumers immediate feedback depending on their exploration.

- Combined Bar and Line Chart: This two-axis chart shows the percentage of positive results, while bars indicate the number of drug tests performed annually. Comparing testing volumes and positive rates over time is made simple for users by the integrated view.

- Heat Map: Using color intensity to visually distinguish between states, the heat map shows positive outcome percentages by jurisdiction. This makes it easier for users to spot areas with greater or lower positive rates.

- Pie graphic: This graphic provides readers with a better understanding of how testing activity is divided proportionately among states by showing the number of drug tests performed per 10,000 driver licenses by jurisdiction.

The website adhered to four fundamental visualization principles to guarantee the drug testing dashboard's accuracy, clarity, and inclusivity for all users.

First, using precise and suitable chart scale maintains graphical integrity. In order to preserve proportionality, all axes will start at appropriate baselines, and no overly dramatic visual effects—like distortion or 3D elements—will be employed. Furthermore, the dual axes in the combined bar and line chart will be meticulously calibrated to guarantee that comparisons between the two datasets are impartial and not deceptive.

Second, scalability is an important design feature of the dashboard. On a desktop, tablet, or mobile device, the layout and graphic components seamlessly adapt to the various screen sizes since they are totally responsive. In order to ensure that users can easily navigate and engage with the dashboard on any device, responsive design was also used in the creation of interactive elements like tooltips and filters.

Thirdly, usability and readability are improved by design decisions that address accessibility. To achieve clear visibility, this involves utilizing color choices for the backdrop and text that are highly contrasted. To ensure visual clarity on all devices, the dashboard will always use the same font styles for all elements, including headers, tooltips, and labels. Even those without technical experience or understanding can easily interpret the data thanks to the use of legends and user-friendly chart formats.

Finally, to highlight distinctions and direct user interpretation, graphical elements like color, size, form, and annotations are carefully employed. For instance, the combined bar and line chart's unique shapes aid consumers in differentiating between percentages and quantitative numbers. Annotations and brief insight texts highlight important characteristics, patterns, or trends, much like descriptive headers. The visualisations also use tooltips, which allow users to hover over objects such as pie slices, lines, bars, points, and map regions to view specific data values and contextual information.

These four fundamental ideas—accessibility, scalability, graphical integrity, and efficient visual encoding—work together to guarantee that the drug test

dashboard is accurate, responsive, and usable on a range of devices and in a variety of viewing situations.

Reasons for Selecting Colors, Labels, and Layouts

Clarity and accessibility are still supported by the color scheme in many renderings. For instance, the darker the shade in the heat map that shows the positive rate by jurisdiction, the higher the positive rate in that particular location; similarly, in the pie chart, each hue corresponds to a different jurisdiction. The dashboard will have a logical top-to-bottom structure, with filters for jurisdiction, year, and testing stage first, followed by the key performance indicators (KPIs), and then the chart visualizations.

Making Use of Tooltips and Annotations

Each chart will have insight boxes and brief notes below to highlight important trends or explain the visual's purpose. When users hover over individual objects, like bars, lines, or map areas, tooltips will be added to show specific data values. This will allow users to quickly and easily obtain deeper insights without having to make any further clicks or navigate. The overall layout of the drug test dashboard facilitates precision, clarity, and data exploration. Through the integration of well selected chart types, a straightforward structure, and interactive elements such as tooltips, the dashboard guarantees that the dataset is clear, interesting, and significant for every user.

3.3 Interaction Design

The dashboard includes a number of interactive elements intended to improve user experience, engagement, and understanding of the data. These interactions let users actively explore, filter, and change the data, allowing them to do more

than just see static visualisations. Users can now find more in-depth information that corresponds with their particular interests or questions thanks to this.

Features That Are Interactive

- **Filtering:** This is the main way that people engage. Users can filter data by year, testing stage, and jurisdiction by choosing selections from dropdown menus at the top of the dashboard. Users may quickly spot patterns, compare states, and examine certain stages like preliminary or confirmatory testing thanks to the real-time updates of all metrics and visualisations that are applied.

- **Tooltips:** When a user hovers over objects like bars, line points, or map areas, tooltips that are included with every chart element are displayed. These tooltips assist users understand charts by providing comprehensive information without taking up too much visual space, such as test numbers, positive rates, or stage-specific data.

- **Reset View:** Users can restore the dashboard's default country overview by using the Reset View option, which removes all filters. Users can now start a new exploration path without having to manually reset each option, making navigating easier.

- **Animations:** The responsiveness of the dashboard is improved by fluid animations. For example, bars progressively move and lines repaint to reflect updated data as filters are applied. Soft fade-ins are used for tooltips and highlights to direct the user's attention without becoming distracting. The experience is made more polished and user-friendly by these transitions.

Feature	Interaction Method	User Behaviour	System Response
Filtering	Dropdown	Select year, state, or test stage	Charts and metrics update dynamically with smooth transitions
ToolTips	Hover	Hover over bars, lines, or map areas	Tooltip fades in showing detailed data
Reset View	Click	Click the “Reset View” button	Clears all filters and resets dashboard to default view
Animation	Triggered by data change	Apply filter or reset view	Charts animate to reflect new data

4. Iteration and Validation

4.1 Testing and Refinements

To enhance its technical functionality and visual clarity, the dashboard underwent multiple modifications. A test-refine cycle was used throughout the development

process, whereby visual outputs, user interactions, and data behavior were routinely checked and any necessary adjustments were made in response to the results.

Chart and Layout Refinements

- Axis Fixes for Bar and Line Charts
  At first, the chart was hard to read because the axis labels were missing. The solution to this was to use D3.js to explicitly add an X-axis ("Year") and two Y-axes ("Tests Conducted" and "Positive Rate (%)"). This made it easier to see how the bars' scale differed from that of the line graph.

- Pie Chart Labeling and Visibility
  The pie chart's initial iteration was too small, making the labels and jurisdiction portions unreadable. After resizing the chart from 400 to 600 pixels, arc.centroid() was used to add text labels to each slice that displayed the state name and test count. This made it possible for users to rapidly determine the tests' proportionate distribution.

- KPI Fix for Tile Responsiveness
  A skewed arrangement resulted from the KPI tiles stretching to span the entire row when only one state (such as NSW) was chosen. A fixed maxwidth and flex-wrap setting was added to the tile container to maintain uniformity across tile counts and a clear visual structure irrespective of the filter option.

- Rendering Dynamic Content
  For several fields, such as "Charges," jurisdictions including Tasmania (TAS) and the Northern Territory (NT) have zero or missing information. Clarity and noise reduction were enhanced by adding a condition that only

displayed "Charges" if the value was more than 0 in order to avoid layout breaks or confusing zeros.

Testing for Filter Functionality was done by hand.

- To make sure that the charts updated correctly, each dropdown (Year, Jurisdiction, and Location) was tested separately and together.

- **Validation of Reset Button**
  We checked the Reset View button to make sure all filters were removed and the default data was properly restored.

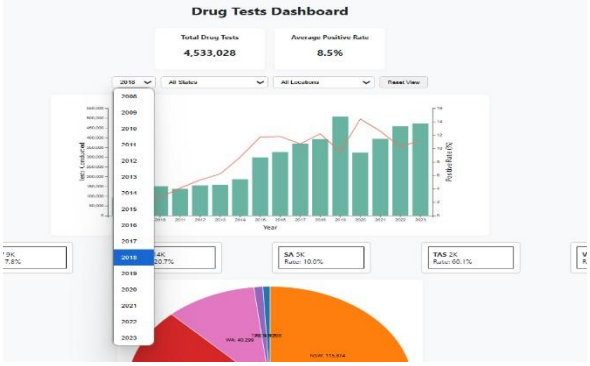
- **Extreme Situations**
  Particular care was taken to ensure that charts did not break or distort results by filtering data with zero values or missing fields.

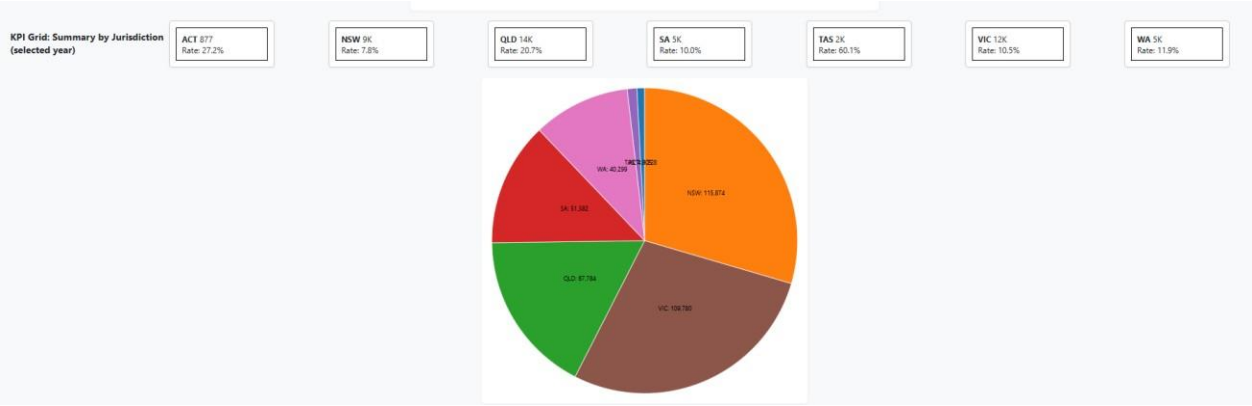
Changes Driven by Feedback

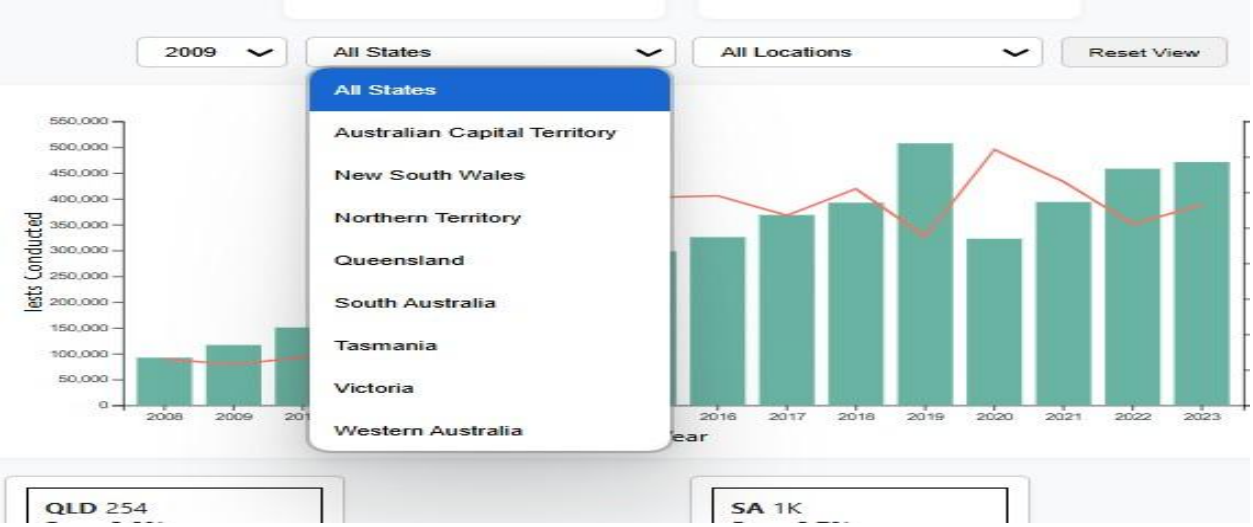
Classmate comments included ideas like making the pie chart easier to read, enhancing tooltip spacing, and streamlining the layout structure as a whole. Several of the above-mentioned improvements were directly influenced by these suggestions.

In addition to providing accurate and current visualisations, the iterative process made sure that the finished dashboard improved user comprehension, particularly when filtering by year or comparing between jurisdictions.


Drug Tests Dashboard
Total Drug Tests
4,533,028
Average Positive Rate
8.5%
2010
All States
All Locations
Reset View
Tests Conducted
Positive Rate (%)
Year


Drug Tests Dashboard
Total Drug Tests
4,533,028
Average Positive Rate
8.5%
Year


KPI Grid: Summary by Jurisdiction (selected year)
ACT 877
Rate: 27.2%
NSW 9K
Rate: 7.8%
QLD 14K
Rate: 20.7%
SA 5K
Rate: 10.0%
TAS 2K
Rate: 60.1%
VIC 12K
Rate: 10.5%
WA 5K
Rate: 11.9%
WA: 40,299
NSW: 115,874
QLD: 87,784
VIC: 109,780


2009
All States
All Locations
Reset View
All States
Australian Capital Territory
New South Wales
Northern Territory
Queensland
South Australia
Tasmania
Victoria
Western Australia
Tests Conducted
2008
2009
2016
2017
2018
2019
2020
2021
2022
2023
Year

QLD 254
SA 1K

4.2 Usability Evaluation

The dashboard's capacity to facilitate user exploration of drug test data across jurisdictions and time was assessed through usability testing. Since the project was finished independently, peer review and self-evaluation utilizing accepted usability principles were used for informal testing**.**

Evaluation Method

Task-Oriented Evaluation

To mimic usual interactions, a list of typical user goals was employed, which included:

- Changing the criteria to see national trends
- Analyzing positive rates across several years
- Verifying data at the station level from a chosen jurisdiction

Self-Selection

The interface was regularly tested by the developer to guarantee consistency, logical flow, and visual clarity. This involved examining tile arrangement, filter behavior, and chart redraw accuracy in various scenarios.

Strengths Found

- Dropdown menus were simple to use and provided precise results.
- Exploration was simple and non-destructive thanks to the reset button.
- Regional metrics were efficiently summarized via KPI tiles.
- The charts were simple to understand and did not overburden users with extraneous information.

Restrictions

- On smaller devices (such as mobile ones), the dashboard is not completely responsive.
- Interactive tooltips are not included in the pie chart (planned for final submission).
- Due to solo work restrictions, there was no formal usability testing session.

Overall Evaluation

The dashboard effectively accomplishes its objective of allowing users to examine data from roadside drug tests by year and jurisdiction. Iterative design, graphic improvements, and continuous usability testing made the interface more user-friendly and educational. Although there is certainly room for enhancement in certain areas, such advanced interactivity and mobile responsiveness, the present version provides a clear, interesting, and useful experience that facilitates data-driven discoveries.

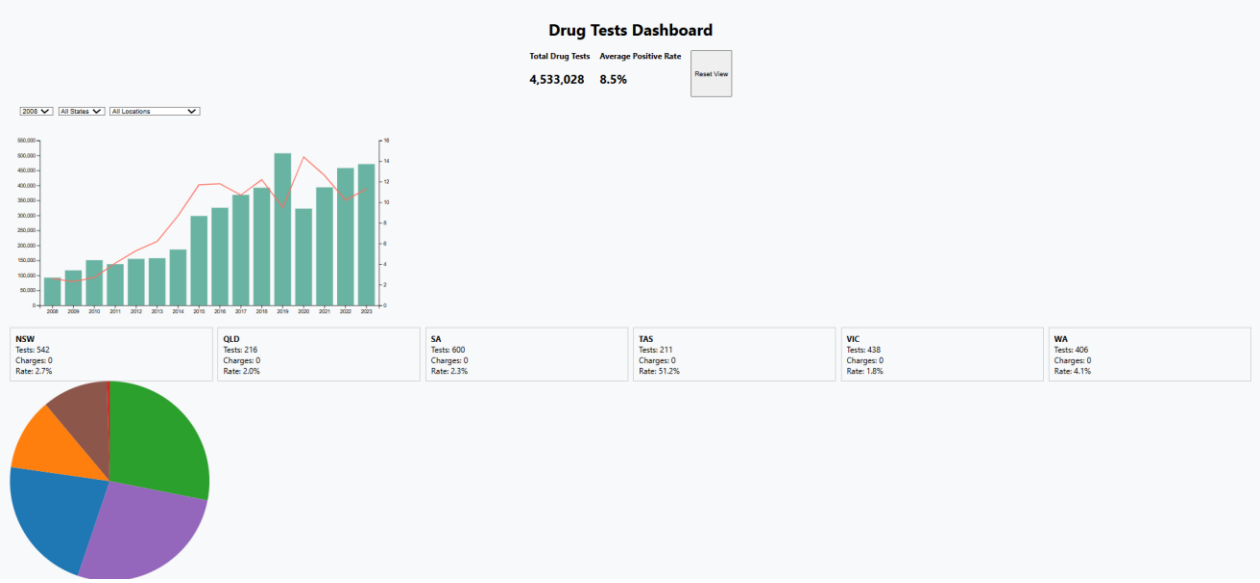
5. **Conclusion and Future Improvements**

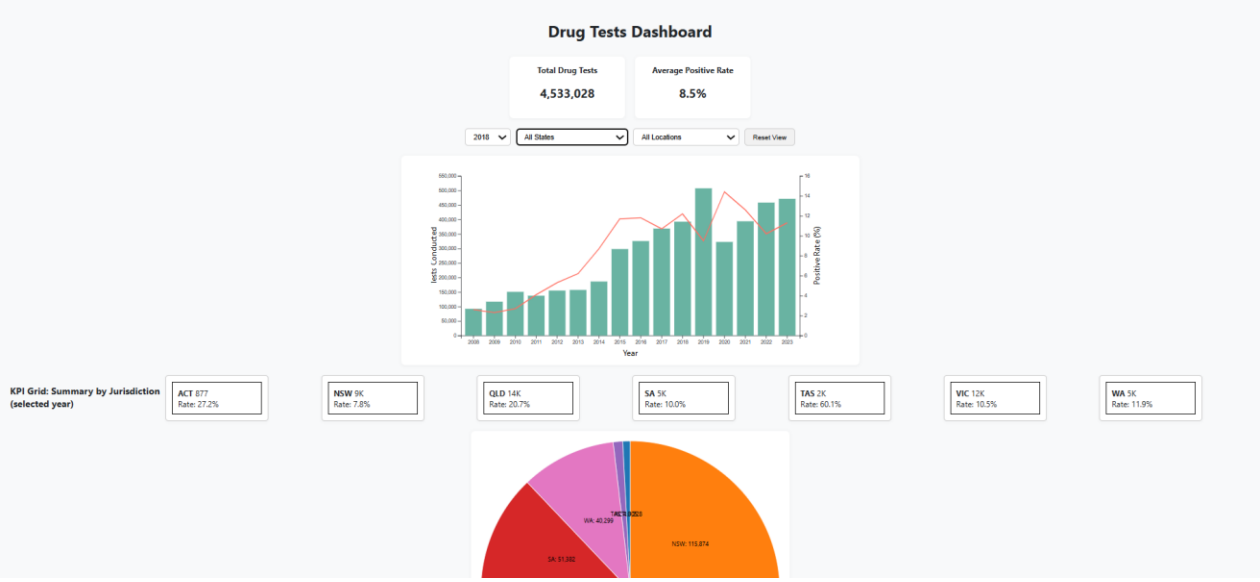
The developed drug testing dashboard successfully transforms complex enforcement datasets into an interactive and accessible visualisation tool. Through iterative design, usability testing, and technical refinements, the dashboard now enables users to explore key trends in roadside drug testing across Australian jurisdictions and time periods. Features such as dynamic KPI tiles, a combined bar and line chart, and a comparative pie chart provide clear insights into testing volumes, positive rates, and regional enforcement differences. Feedback-driven improvements, including enhanced chart readability, filter responsiveness, and layout adjustments, have further strengthened the dashboard's clarity and usability.

Looking ahead, several enhancements can be implemented to elevate the dashboard's functionality and user experience. These include adding interactive tooltips to the pie chart, improving mobile responsiveness for smaller devices, and integrating additional demographic and geographic data layers (such as age group trends or urban vs. regional comparisons). Incorporating more advanced filtering options and exporting capabilities would also enrich user exploration.

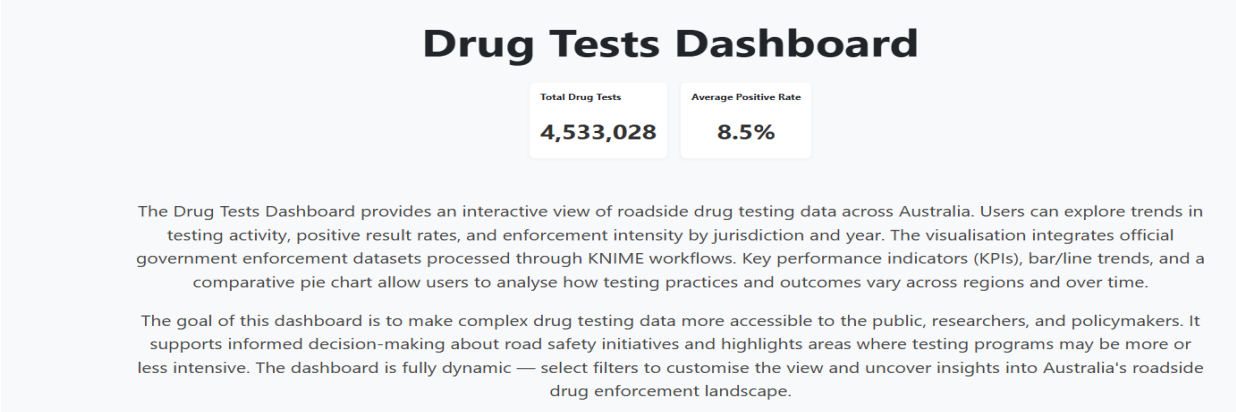
Furthermore, conducting formal usability testing with a broader participant base will provide valuable feedback to guide future iterations. Overall, the dashboard provides a solid foundation for ongoing refinement and offers a practical resource for stakeholders seeking to understand and act upon Australia's roadside drug enforcement trends.

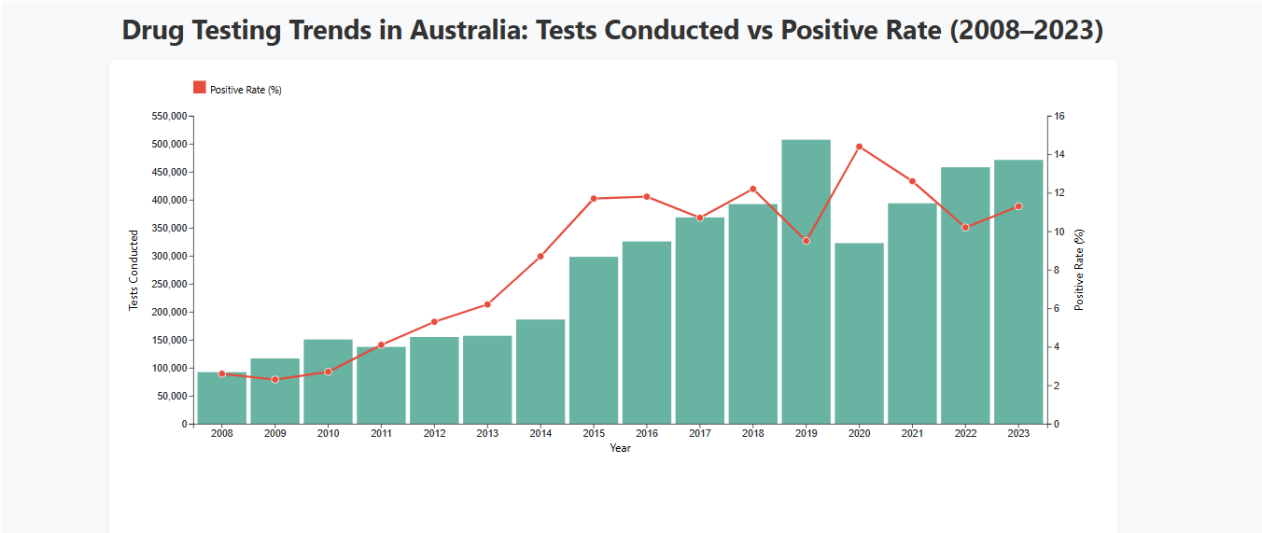
Website Dashboard before (Screenshots):

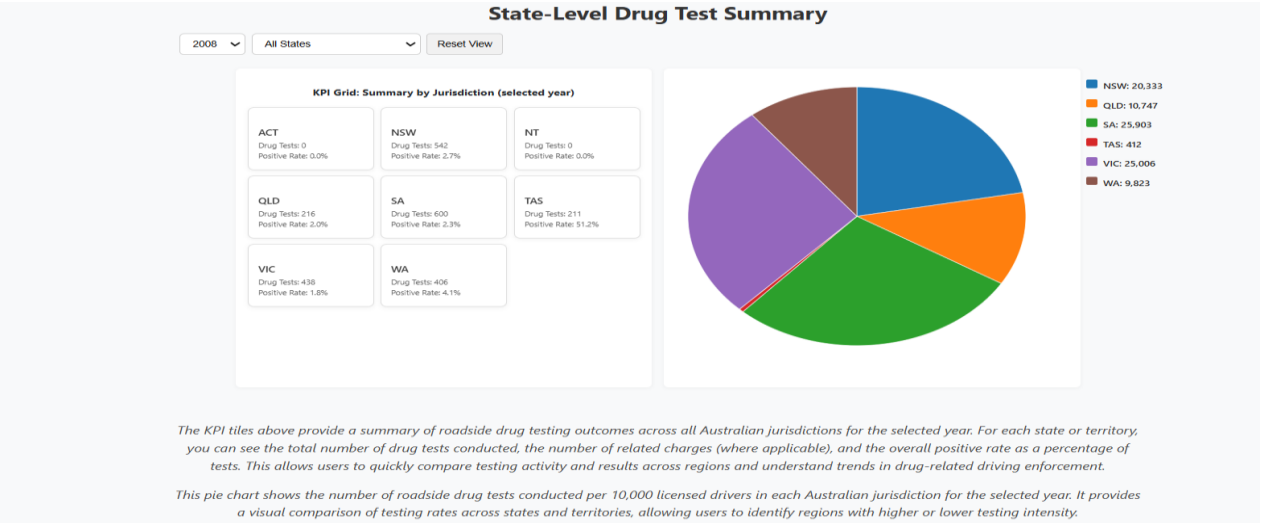




Website Dashboard After (Screenshots):







Appendices

Gen AI declaration

- This project report and the associated dashboard were created primarily through my own work and effort. Generative AI tools (such as ChatGPT or Grammarly) were used solely to assist with grammar checking, paraphrasing, and improving clarity in written sections. No AI-generated content was used to produce original analysis, visualisations, or to misrepresent data insights. All data processing (via KNIME), visualisation code, dashboard design, and exploratory analysis were conducted independently by me. Any references, external sources, or tools consulted have been appropriately cited within this document. I fully understand and have complied with Swinburne University's guidelines on the responsible and ethical use of generative AI in academic work.

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