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Introduction

The Cost of Progress: How the Pursuit of Income Fuels Pollution Mortality

Motivation:

Climate change brings vast and profound implications, yet pollution continues to pose a substantial and distinct threat. Rather than solely detailing the already well-documented harms of pollution, I wish to delve into its root causes and the systems that perpetuate it. I am concerned by the potential for today's seemingly insignificant actions to fuel a future of the destruction of our own planet, and the lack of action by society.

Aim:

I aim to uncover the "where" and "what" of pollution's origins. By focusing on these underlying factors, I hope to provide a clearer understanding of what drives this unending treadmill of materialism.

Sheet 1

Data Points

1. Income Disparity in Air Pollution Deaths
2. Geographical Distribution of Air Pollution Death Rate Residuals
3. Plastic Waste Outliers (vs World GDP share)
4. Relationship between GDP Growth Share and Mismanaged Plastic Waste Share
5. Who Pollutes vs. Who suffers?
6. Country stats breakdown

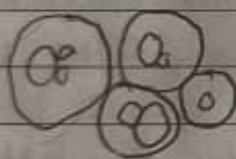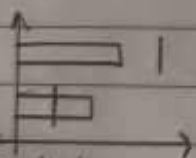Objective - Target audience are policy makers. Keep it short and clear

Ideas
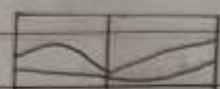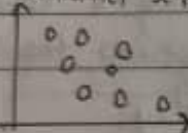
1. Parallel sets
2. Choropleth / Prism Map
3. Scatter plot
4. Tree Map
5. Bar Chart
6. Circle Packing
7. Connected Dot Plot
8. Quadrant Analysis
9. Bullet Graph
10. Slope Chart
11. Waffle Chart
12. Radar Chart
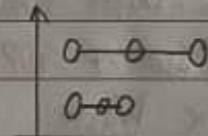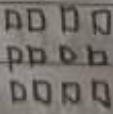
Categorize

2 → Highlight geograp

1, 3, 5, 8, 10 → Highlight inter-relation

4, 6, 7, 9 → Highligh outliers

5, 12 → For country breakdown

Combine & Refine

Choropleth combines with all others for colour-coded income groups

Filter

Bar chart - not aesthetic
Scatter plot - too technical
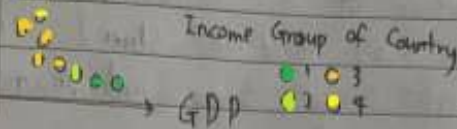Prism map - hard to see

Questions

- Are these easily understood by people in non-technical background?
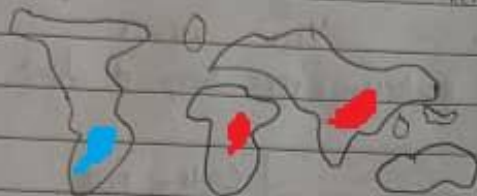- Does it tell the story convincingly?

Sheet 2
Layout
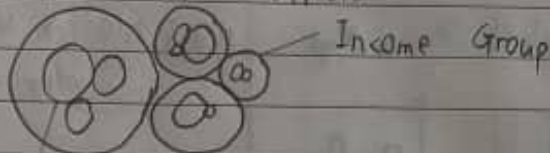
Income Disparity in Air Pollution Deaths

Death Rate

Income Group of Country

→ GDP

● 1 ● 3
● 2 ● 4

Geographical Death Rate Outliers

Death Rate Residuals

Less ● ● ● More

Plastic Waste Outliers

Income Group

Country

GDP Growth Share VS Plastic Waste Share

Country

A | O—O—O   Past / Current GDP
B | OOO   Plastic Waste

→ % World Share

Who Pollutes, Who Suffers?

Deaths

Income Group

● 1 ● 3
● 2 ● 4

→ Plastic Waste Share

Interactive Display on Country Select

GDP
Deaths
Plastic Waste Share
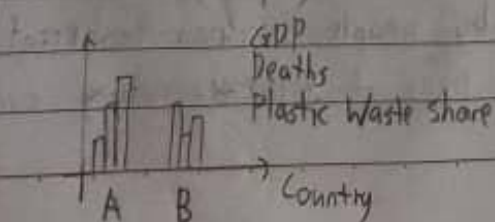
A B → Country

Info
Title: FIT 5147 D VP
Author: Adrian Leong
Date: 19 / 5 / 2025
Sheet 2

Focus
Factual accuracy in presentation

Operations
Clicking a country brings up the interactive display

Filter checkboxes to apply filters for countries

Navigation buttons to move between displays

Discussion
Pros: Accurate factual representation

Cons: Statistics heavy
Technical
Boring

Sheet 3

Layout

Income Disparity in Air Pollution Deaths

Income   Plastic Waste% Deaths

Geographic Death Rate Outliers
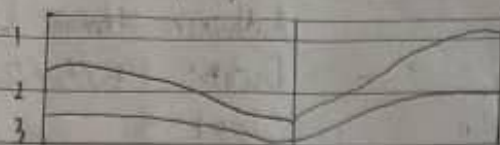

Bigger circle = More deaths

Plastic Waste Outliers

Share of: GDP
Plastic Waste
Population

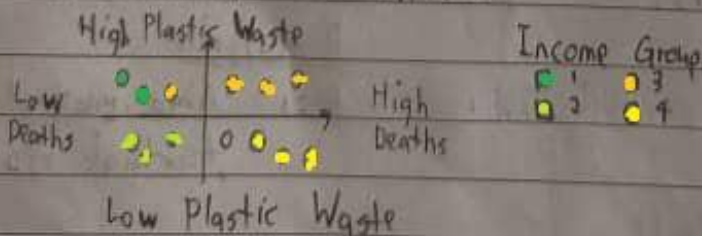GDP Growth Share VS Plastic Waste Share

% growth   % Plastic share

Who Pollutes, Who Suffers?

High Plastic Waste

Low
Deaths   High
                         Deaths

Income Group
☐ 1   ☐ 3
☐ 2   ☐ 4

Low Plastic Waste

Interactive Display on Country Select

GDP
Deaths   Plastic Waste
Imports Exports

Focus
Visual Appeal

Operations
Same as Sheet 2

Discussion
Pros : Looks nicer
       Visually intuitive
Cons : Details abstracted away
       Less accurate
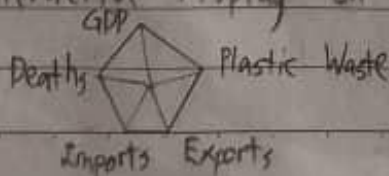
Layout

Income Disparity in Air Pollution Deaths
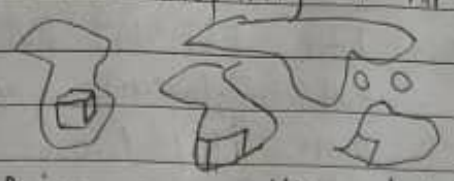
Prism map - Higher height
represents more deaths

Geographical Death Rate Outliers

Country

Income
Group

1 3
2 4

Death
Rate

Plastic Waste Outliers

Plastic Waste   GDP

GDP Growth Share VS Plastic Waste Share

% Share

1 3   Income
2 4   Group

Country

A   B   C
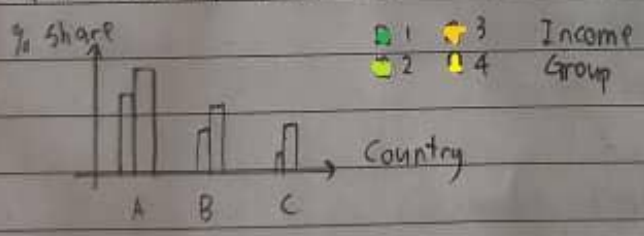
Who Pollutes, Who Suffers?

Deaths   Plastic Waste

Interactive Display on Country Select

Info

Title: FIT 5147 DVP
Author: Adrian Leong
Date: 19/5/2025
Sheet 4

Focus

Alternate presentation with
factual accuracy

Operations

Same as sheet 2
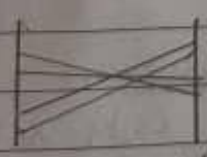
Discussion

Pros: Also accurate
factual representation

Cons: Less intuitive

Layout

Income Disparity in Air Pollution Deaths

Income   Plastic Waste %   Deaths

Geographical Death Rate Outliers

Death Rate Residuals
Less   ●   More

Operation
Clicking a country brings up the interactive display

Filter checkboxes to filter or sort countries

Plastic Waste Outliers
Income Group
Country

Navigation buttons to move between displays

GDP Growth Share Vs Plastic Waste Share
Country
A   o—o—o
B   ooo
          → % World share

Details
Dataset from
- ourworldindata.org
- data.worldbank.org
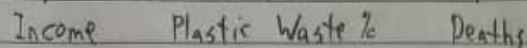
Who Pollutes, Who Suffers?
High Plastic Waste
Low Deaths   High Deaths
Low Plastic Waste
Income Group
■ 1   ■ 3
□ 2   □ 4

Dependencies
R
- shiny
- Leaflet
- Dplyr

Interactive Display on Country Select
GDP
Deaths   Plastic Waste
Imports   Exports

Estimates
Cost - N/A
Time - 10/6/2025 completion

Data sources:

https://ourworldindata.org/grapher/gdp-per-capita-worldbank

https://ourworldindata.org/grapher/death-rate-household-and-ambient-air-pollution

https://ourworldindata.org/grapher/share-of-global-mismanaged-plastic-waste

https://ourworldindata.org/explorers/population-and-demography

https://data.worldbank.org/indicator/NE.IMP.GNFS.ZS?view=map