

GEA1000 Tutorial 2

AY 24/25 Sem 2 — github/omgeta

- Q1. (a.) Based on the data, before 2018 is positively associated with recycling of Paper/Cardboard

	Before 2018	2018 onwards
Recycled ('000 tonnes)	1176.1	1904
Disposed ('000 tonnes)	1152	2439
Total ('000 tonnes)	2328.1	4343

- (b.) No, the total amount is greater because more data points were counted from multiple years instead of from a single year before 2018. However, the rate of recycling is still lower.
- (c.) Yes; From (a) we know $\text{rate}(\text{recycled} \text{ — before 2018}) \not\sim \text{rate}(\text{recycled} \text{ — 2018 onwards})$. By symmetry rule, $\text{rate}(\text{before 2018} \text{ — recycled}) \not\sim \text{rate}(\text{before 2018} \text{ — disposed})$. Then by basic rule on rates, we have $\text{rate}(\text{before 2018} \text{ — recycled}) \not\sim \text{rate}(\text{before 2018}) = 34.9\%$ which is Chuan's claim
- (d.) Straits Time article says that domestic overall recycling rate is between 19-22% but Tammy's data points for different sources of waste are all below 19% making it impossible to reach an overall rate of 19-22%. This is assuming there are no other additional sources of waste not shown in Tammy's data.
- (e.) Positive association between high average monthly usage of Paper/Cardboard and healthy recycling habits.
- (f.) Trend absorbed for majority of years is high usage is negatively associated with healthy habits, which is reversed for the overall rate. Therefore, year of study is a confounder.
- (g.) For both foreigners and non-foreigners, high usage has equal or higher healthy rates than low usage, so Simpson's Paradox is not observed and therefore, foreigner status is not a confounder.
- (h.) Selection bias exists from the sampling at only 1 location and during a limited time period. Hence, we cannot generalize our findings. Sampling frame does not cover all NUS students.