

Social Service Agency

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0.1 Background

You are working for a social service agency that keeps track of its clients and donors using Excel. While the agency has kept track of these two groups of individuals, the agency has done little to evaluate their work, and to assess ways in which they might do better.

The agency would like you to provide them with some data visualization, and they will provide you with a file of **clients** (in 2 formats)¹, and a file of **donors**.

0.2 Clients

Here is what the data file of clients looks like.

NB that the mental health instrument is normed such that **100** is considered to be an *average* or *usual* mental health score. Higher scores indicate higher psychological wellbeing.

¹This is an **advanced** topic, but it is worth thinking the idea that sometimes data visualization problems are really problems of how the underlying data is structured. Initially, the data called **clients** is easier to use, but for some purposes **clients_longform** is easier to work with. The two files contain the same *information*. Are there circumstances in which one would be easier to work with than the other?

Table 1: Table continues below

ID	age	gender	race_ethnicity	family_income	program
2892	23	Male	African American	42359	Program B
1971	39	Female	Asian American	66500	Program C
4728	26	Female	Asian American	52726	Program C
1020	24	Male	Latinx	52911	Program D
4429	36	Female	Asian American	50287	Program C
3136	33	Male	African American	45570	Program C

mental_health_T1	mental_health_T2	latitude	longitude
95.25	106.8	42.16	-83.6
82.64	96.3	42.29	-83.88
80.49	98.72	42.14	-83.78
93.82	91.67	42.24	-83.68
83.37	99.69	42.18	-83.64
75.28	92.9	42.21	-83.7

The agency also had an intern from a school of social work who did some preliminary data visualization.

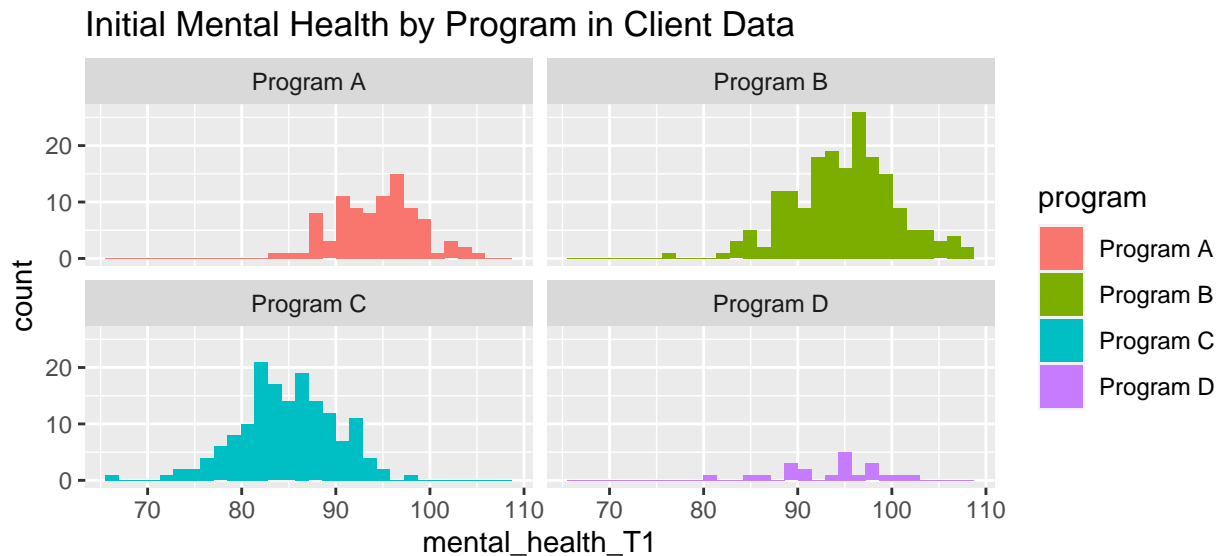


Figure 1: Preliminary Data Visualization of Clients

Agency staff would like to investigate questions of the following nature.

- What are demographic characteristics of clients?

- Do any demographic characteristics of clients have an association with mental health or program use?
- Is there any additional information that the agency should be collecting about clients?
- Are any of the programs associated with better mental health at Time 2?

The Director of the agency says:

“I’ve heard you can investigate things like this with `ggplot()`, maybe using something like `geom_point()`, `geom_smooth()`, and `facet_wrap(~)`.”²

0.3 Donors

The agency also has a file of donors which looks something like this:

ID	age	gender	neighborhood	annual_donation
Mgm4oPq	53.39	Male	Neighborhood A	289
DGMfzPT	35.69	Male	Neighborhood A	307
qHWrk3M	31.47	Male	Neighborhood A	178
HzkwKsE	42.99	Female	Neighborhood B	1076
DVblPel	42.43	Female	Neighborhood A	174
lrOPNAM	43.23	Male	Neighborhood A	157

The agency would like to know.

- In terms of available information, what are the demographic characteristics of donors?
- Is there any additional information that we should collect about donors?
- Is there any information that predicts which donors will donate larger amounts of money?

The agency did hire a consulting agency to do some preliminary analysis of their donors. After paying the consultant several thousand dollars they received a short report and the attached graphic.

The Director says:

“While the attached graphic may give you, and us, some guidance, we are wondering if you can produce anything that is a little simpler, a little more straightforward, and a little more clear.”

²Yes, the Director really talks like this sometimes.

Donor Analysis



Figure 2: Preliminary Visualization of Donors