Which Graph

Choosing the right graph to share AMH data

People like graphs.

Done well, graphs:

- Draw the reader's eye.
- Help readers accurately interpret the data.
- Are more memorable and persuasive than text alone.

But if graphs are confusing or messy, people start to doubt the data. That's why we must:

- Use the right graph type for our data
- Follow best practices for each graph type

So, what do you want to highlight with your graph?

Comparisons:

- How much does Alberta spend per person on addiction and mental health care compared to other provinces?
- What is the average length of stay in inpatient care in each zone in Alberta?
- What are the primary reasons for hospital admission for addiction and mental health concerns?

Survey results:

- How useful did attendees find the training session?
- Do the people administering naloxone find the kits easy to use?

Bar graphs and **stacked bar graphs** are great for presenting these results.

See pages 2-3.

Parts of a whole:

- What are the demographics of people using addiction and mental health services?
- What percentage of people would recommend the Virtual Opioid Dependency Program to others?

Single key takeaway:

- What percentage of Albertans suffer from treatment resistant depression?
- How many more schools participated in mental health prevention and promotion activities this year?

Simple highlights or key results can be shown in an **icon array**, **pie chart**, or as a **single large number**.
See pages 4-5.

Trends over time:

- Have the number of referrals changed since the intervention?
- Have the number of admissions changed over the past four quarters?

Line graphs are best for reporting data trends. Combine with bar graphs to consider variables.
See page 6.

Alberta Health Services

Comparison & Survey Results

Bar graphs

Good for:

- Comparing categories (such as diagnoses or clinics)
- Combining with line graphs for comparisons over time

Why use them?

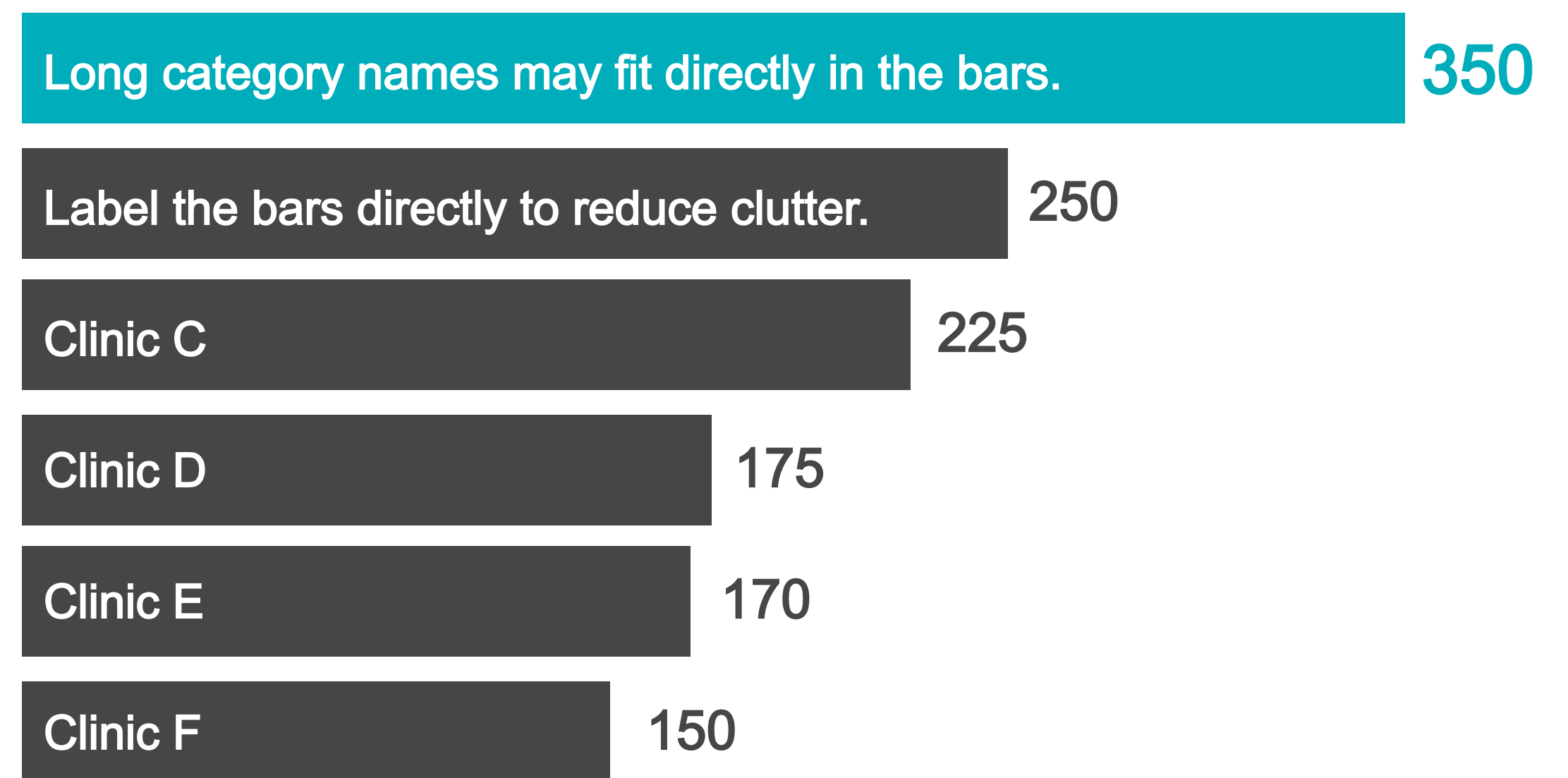- Bar charts are the easiest graph to interpret accurately

Best practices:

Colour:

- Highlight important bars with a brighter colour. Blue is a good choice set against dark grey.
- Use the same action colour for data labels and relevant text.

Layout:

- Arrange the bars greatest to least or least to greatest, unless there is a natural order you must keep (like time periods or age groups).
- Use horizontal bars for long category names.
- Add a line across the graph to provide helpful context (target, standard, or provincial average).
- Space appropriately: The width between the bars should be 50% of the bar width.
- Don't be misleading: Always use a zero baseline, and be careful when adjusting the height and width to not emphasize or downplay changes.
- Label inside the bars whenever possible.
- Limit your graph to a single Y-axis, and label it on the left side (or don't label it at all if the data labels are clear).
- Consider a lollipop graph if all the values are high. This highlights the data and reduces eye strain from too many bars.
  (See "Helpful Tools" to the right for tutorials in Excel and Tableau.)

Clinic A saw the most clients in 2018, an increase of nearly 30% from 2017.

Long category names may fit directly in the bars.	350
Label the bars directly to reduce clutter.	250
Clinic C	225
Clinic D	175
Clinic E	170
Clinic F	150

For the past three quarters, the average length of stay at Clinic B has been above the provincial median.

Measured in days, 2018-2019
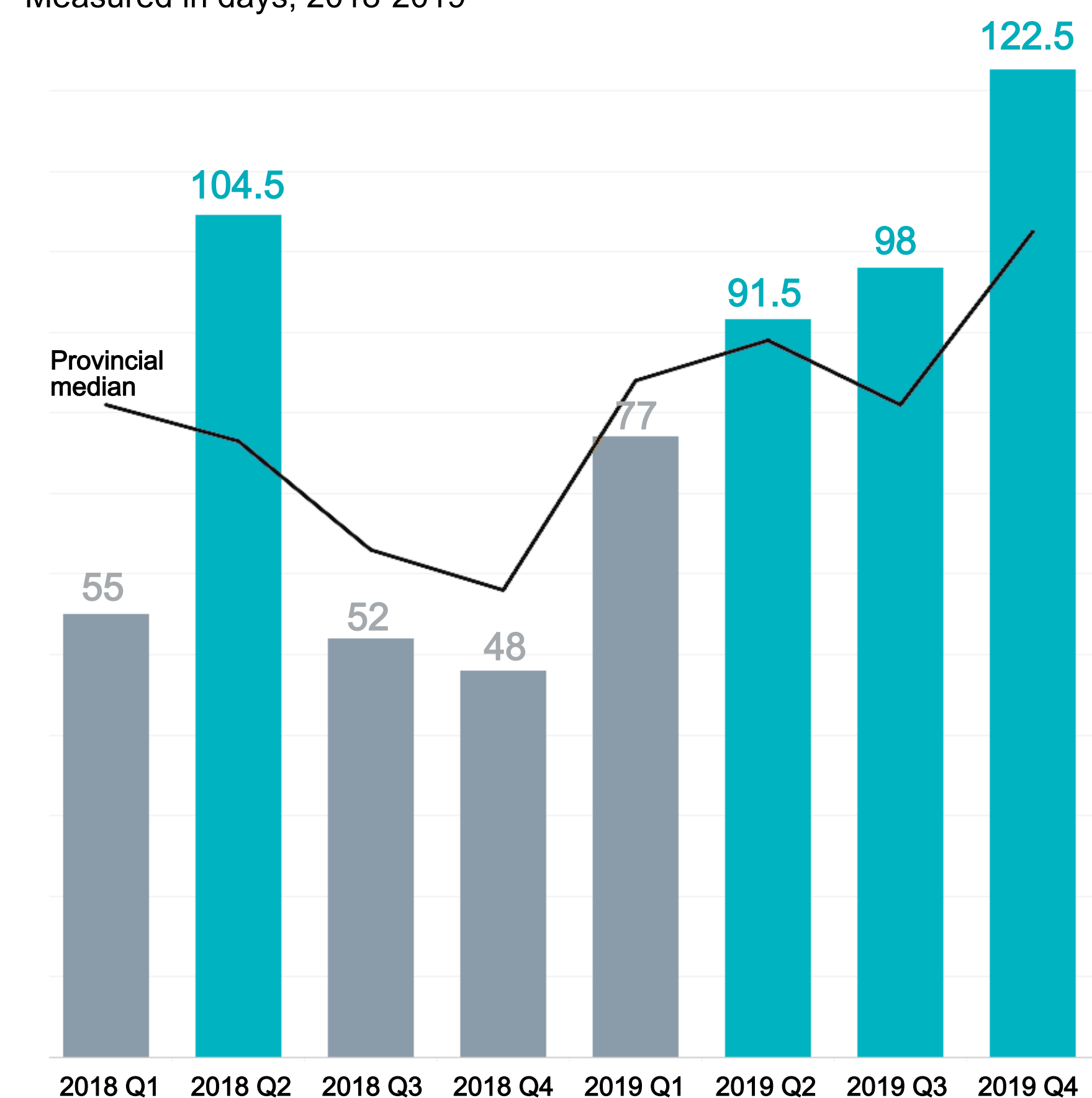
Helpful tools

- Graph Text Should Be Horizontal (Evergreen Data)

- Make a Lollipop Graph in Excel (Evergreen Data)

- When to Use a Lollipop Graph and How to Build One (Tableau)
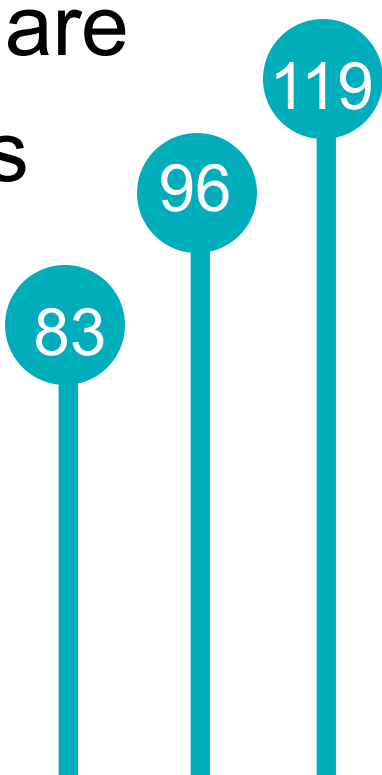
Comparisons & Survey Results

Stacked bar graphs

Good for:

- Parts of a whole
- Rating scales

Why use them?

- Easier to interpret accurately than pie charts

Best Practices
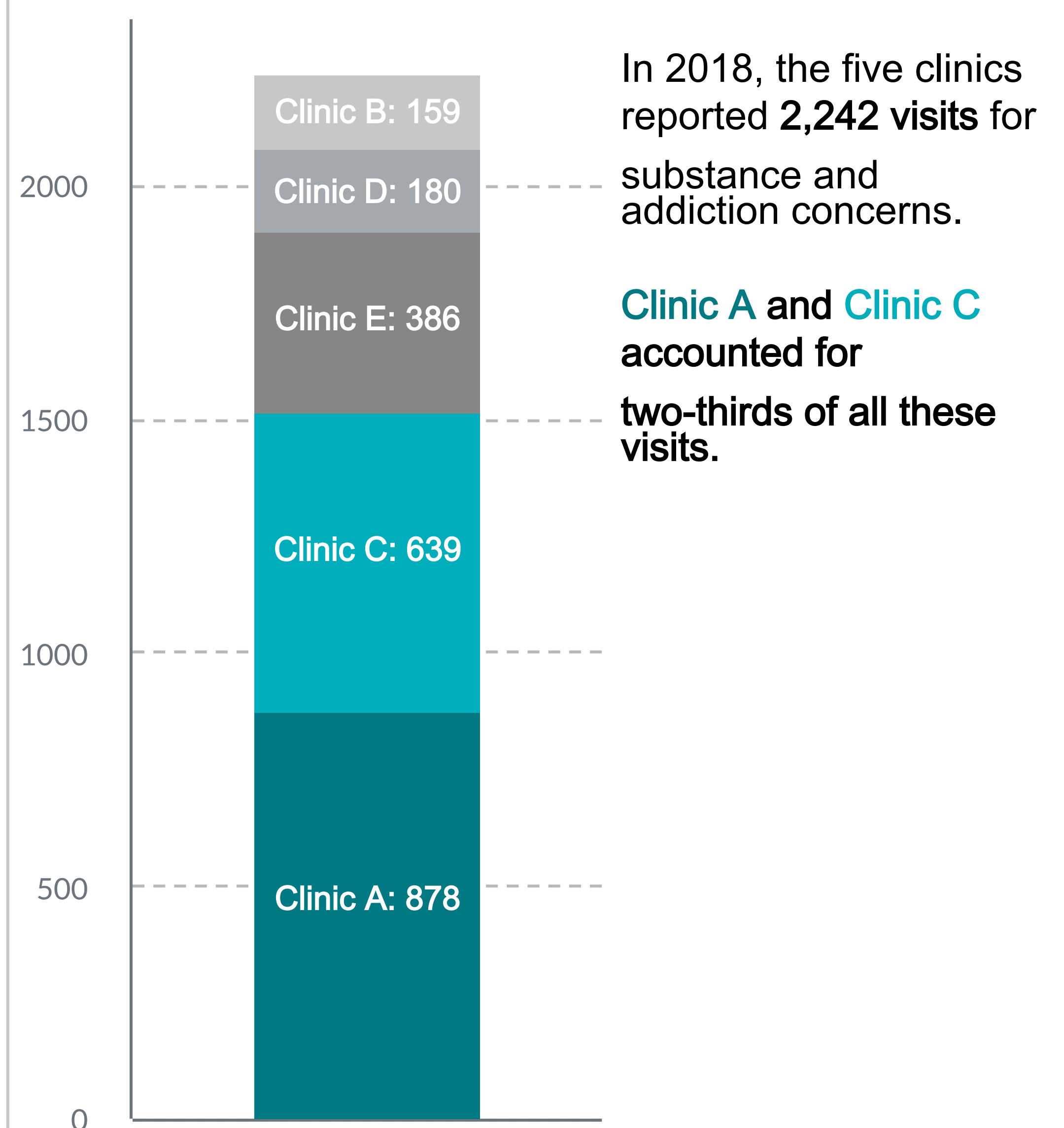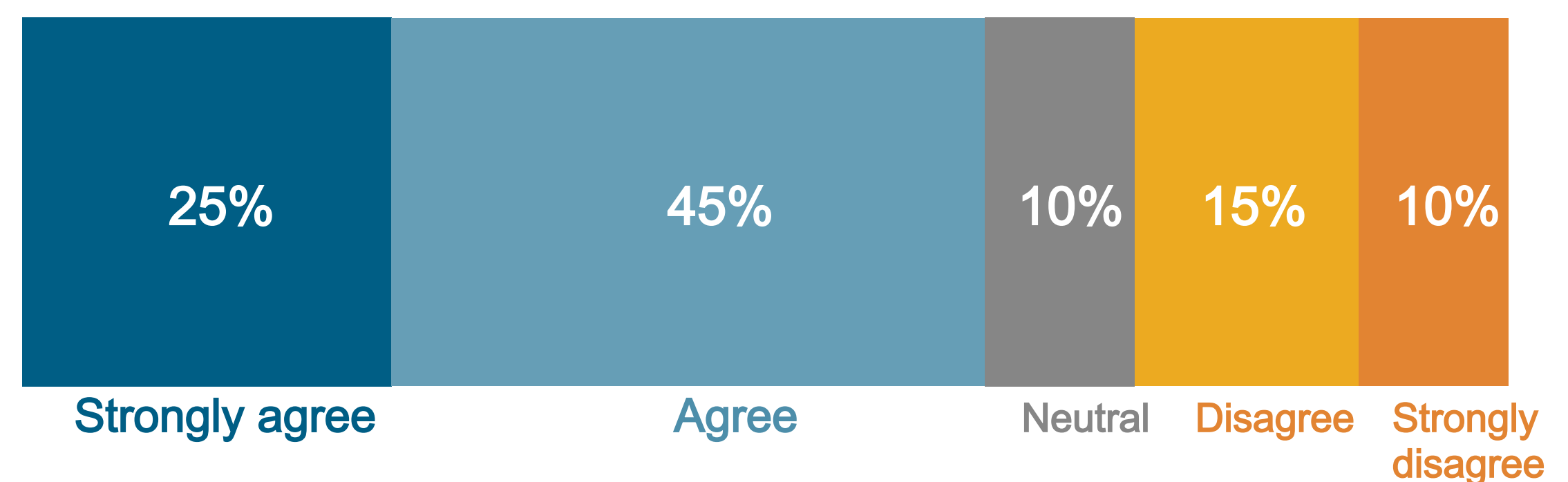
Colour:

- Use shades of one colour for similar answers in diverging data: Strongly Agree and Agree; Strongly Disagree and Disagree.
- Use shades of the same colour for sequential data (Yes, No, Maybe), with the information you want to highlight in the darkest colour.
- Whenever possible, the biggest segment should be the lightest colour.
- Print in both colour and black and white to ensure the meaning isn't lost, and run through an online colourblindness simulator, such as the Coblis Color Blindness Simulator.

Layout:

- Combine similar segments for easier interpretation. Don't be afraid to use an "Other" category for insignificant results!
- Sort the data greatest to least based on what matters most to your audience, unless there is a natural order to maintain (time periods, amounts, age groups).
- Avoid legends. If possible, label segments directly with colour-coordinated text.

Most survey respondents **strongly agreed** or **agreed** that the naloxone kit was easy to use.

25%	45%	10%	15%	10%
Strongly agree	Agree	Neutral	Disagree	Strongly disagree

In 2018, the five clinics reported **2,242 visits** for substance and addiction concerns.

Clinic A and **Clinic C** accounted for two-thirds of all these visits.

2000	Clinic B: 159
	Clinic D: 180
	Clinic E: 386
1500	
1000	Clinic C: 639
500	
	Clinic A: 878
0	

Helpful tools

- Build a Brain-friendly 100% Stacked Bar Chart (Lea Pica)
- How to Make a Diverging Stacked Bar Chart in Excel (Evergreen Data)
- Visualizing Likert-type Data: Try Aggregated Stacked Bars (Evergreen Data)

Single Key Takeaway

Single large numbers

Good for:

- Part-to-whole comparison
- One key takeaway

Why use them?

- Draws readers' eyes
- Simple way to highlight key points

Best practices

- Use sparingly to break up the text, but not as the primary way to convey data in a report.
- Combine with other graphs for more context or emphasis (icon array, pie chart, or bar chart).
- Pair with an image that aids understanding and further draws attention.
- Use only 1-2 fonts.

70% of respondents found the naloxone kit easy to use.

On average, **a person waits** **8-10 YEARS** after the onset of their mental health symptoms **to seek help.**

Each year, **substance-related disorders account for nearly** **20,000 visits** to Alberta AMH clinics.

Icon arrays

Good for:

- Part-to-whole comparison
- One key takeaway

Why use them?

- Improves interpretation for people with lower numeracy skills
- Can humanize sterile statistics
- Visually appealing alternative to pie charts

Best practices

- Label clearly. Icon arrays work well with a single large number in coordinated colours.
- Keep icons consistent throughout your document.
- Don't use more than 100 icons (see example). Don't
- use icon arrays that require a legend or complicated math.
- Don't colour part of an icon. Instead, scale up to use whole numbers.

In 2018, **35% of patients** had to **wait more than 30 days** for an appointment.
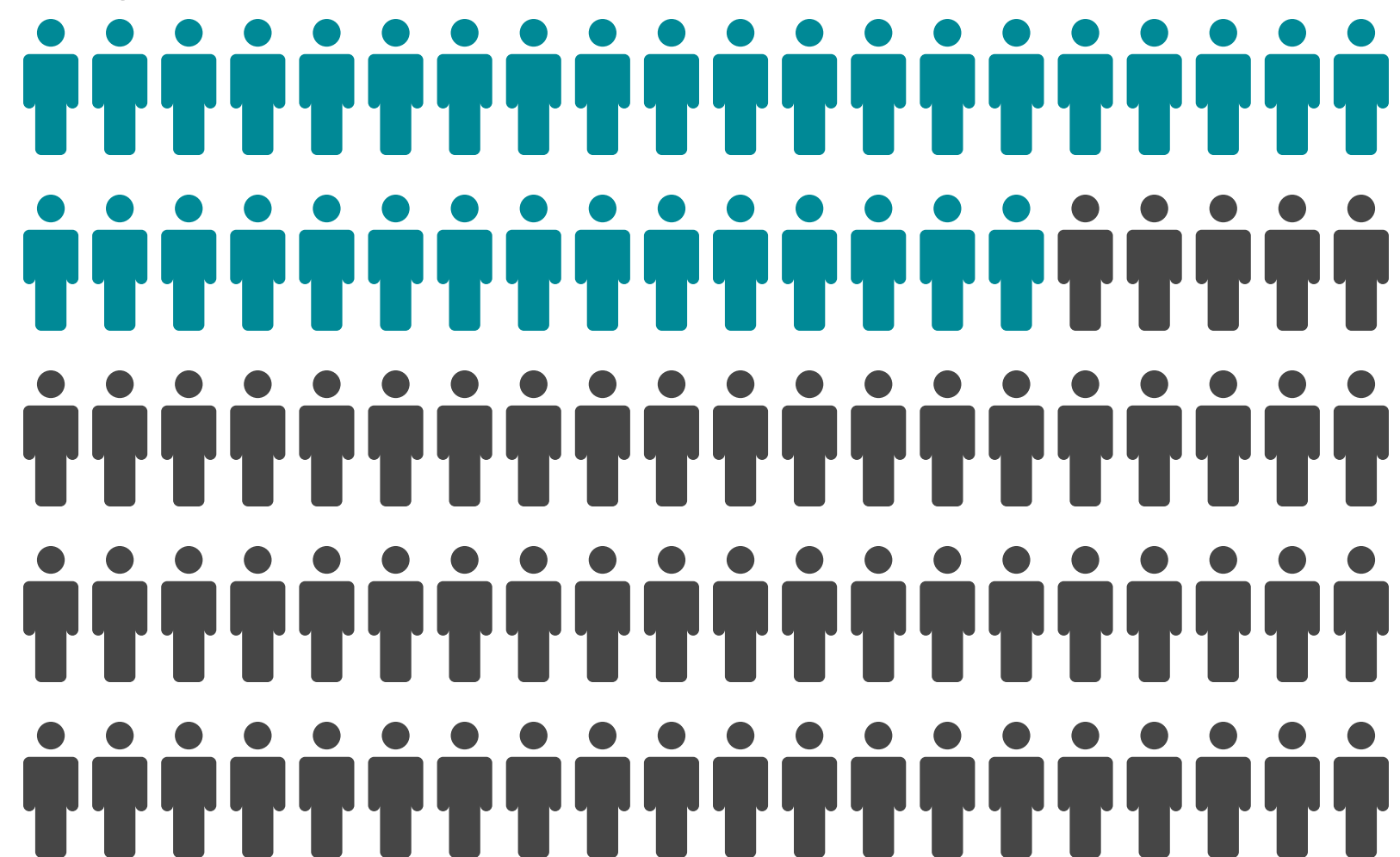
Helpful tools

- [Make a Pictogram in Excel](#) (Evergreen Data)
- [Customizing Icon Matrix Chart](#) (Piktochart)

Single Key Takeaway

Pie charts

Good for:

- Simple parts of a whole (2-4 categories)
- One key takeaway

Why use them?

- Draws readers' eyes
- Breaks up the text

Best practices

Colour:

- Highlight the important segment with colour, and make the remaining wedges drab.
- The biggest segment should be the lightest colour.

Layout:

- Make sure it adds up to 100%! If it doesn't, use a bar chart.
- Limit to 2-4 segments, ideally very similar or very different in size. Humans are bad at judging area and angles!
- Put the largest segment at the top left, and decrease in size clockwise.
- Test the graph without data labels to see how accurately readers interpret them. If labels are needed, consider if the graph is useful.

70% of respondents found the naloxone kit easy to use.
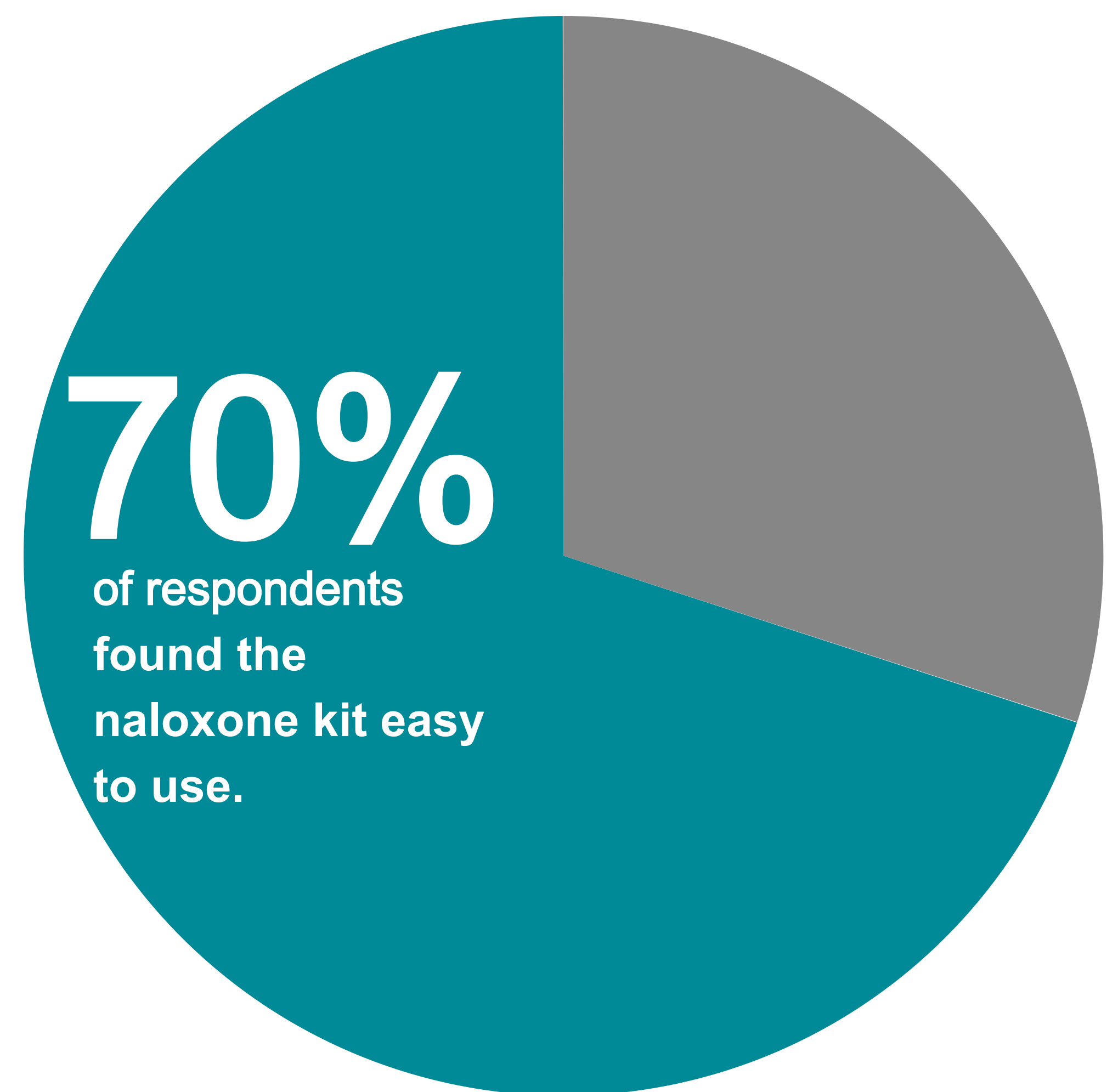
Helpful tools

- When to Use Pie Charts – Best Practices (Excel Campus)
- What to Consider When Creating Pie Charts (Datawrapper)

Trends Over Time

Line graphs

Good for:

- Trends over time
- Relative performance (to other provinces, national average, etc.)

Why use them?

- Easy to interpret accurately
- Readers expect this format for change over time
- Better than bar graphs for lots of data points, as too many bars can get overwhelming

Best practices

- Always keep time on the X-axis and the other variable on the Y-axis.
- Add a horizontal line across the graph for helpful context (target, standard, national average).
- Remove gridlines unless needed for clarity.
- Keep it legible: Highlight 1-2 relevant lines in an action colour, or limit the whole graph to 4 lines in different colours (this is APA Style).

Of the four clinics in Alberta, **only Clinic B had a large decline in admissions** over the past year.
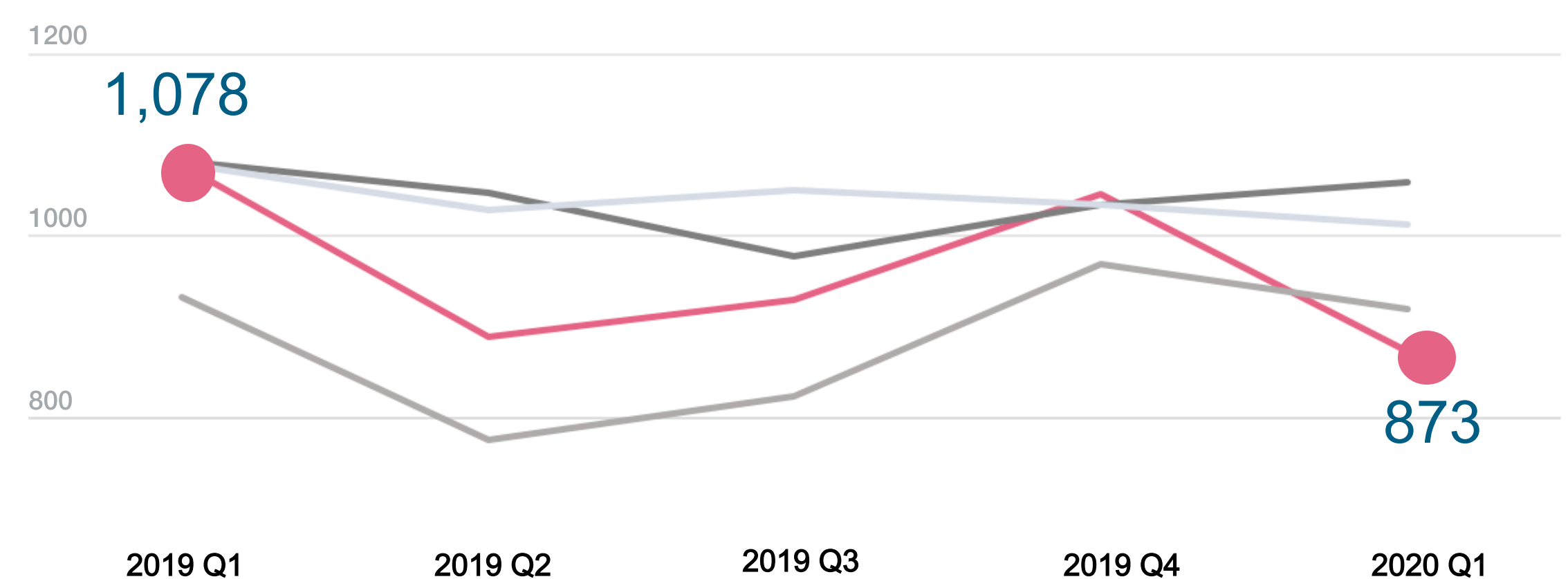
Helpful tool

- [Visualizing Tiny Trends Over Time](#) (Evergreen Data)

More Information

More tools for all graph types

[Data Visualization Checklist](#) (Evergreen Data)

Use this checklist to make sure you're following best practices to create user-friendly, high-impact data visualizations.

[Collection: How to Build Data Visualizations in Excel](#) (Evergreen Data)

This collection of tutorials provides step-by-step instructions on howto apply data visualization best practices using Microsoft Excel.

[The Wizard](#) (Visualizing Health)

This interactive tool asks you questions about the purpose of your health-related visualization to help you choose the right graph for your data and your audience.

[Picking the Right Chart for Your Data](#) (LinkedIn Learning)

This beginner-level online course helps you determine which graphs are most appropriate for your data and the story you want to tell.

Sources

Balliett, A. (2017). Data visualization: Best practices [online course].
https://www.lynda.com/Design-tutorials/Data-Visualization-Best-Practices/585239-2.html

Berinato, S. (2016). *Good charts: The HBR guide to making smarter, more persuasive data visualizations*. Boston, MA: Harvard Business Review Press.

Cairo, A. (2013). *The functional art: An introduction to information graphics and visualization*. Berkeley, CA: New Riders. Evergreen, S. (2017). *Effective data visualization: The right chart for the right data.* Los Angeles, CA: SAGE Publications.

Evergreen, S. (2018). *Presenting data effectively: Communicating your findings for maximum impact.* Thousand Oaks, CA: SAGE Publications.

Evergreen, S. & Emery, A. K. (2016). Data visualization checklist. https://stephanieevergreen.com/data-visualization-checklist/

Galesic, M., Garcia-Retamero, R., & Gigerenzer, G. (2009). Using icon arrays to communicate medical risks: Overcoming low numeracy. *Health Psychology, 28*(2), 210-216. doi:10.1037/a0014474

Geckoboard. (n.d.). Data visualization tips. https://www.geckoboard.com/best-practice/data-visualization-tips

Knaflic, C. N. (2015). *Storytelling with data: A data visualization guide for business professionals*. Hoboken, NJ: John Wiley & Sons.

Tableau Software. (n.d.). Visual analysis best practices.
https://www.tableau.com/sites/default/files/pages/visual_analysis_guidebook.pdf