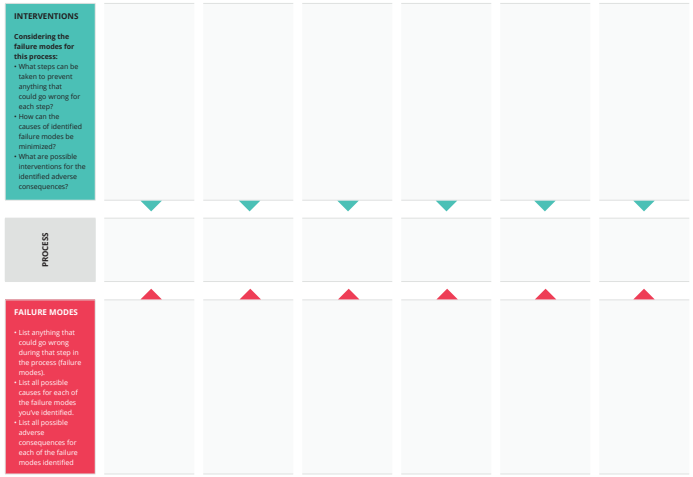
Root Cause Analysis

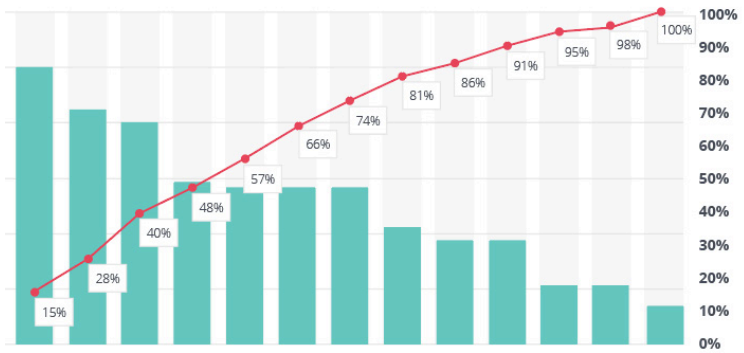
Root cause analysis tools are designed to take a systematic view of barriers, or undesirable outcomes and identify opportunities to understand and address the root-cause of the problem. The undesirable outcome - sometimes known as an adverse event or system failure - provides an opportunity to learn about the conditions that enable this outcome and to generate ideas to prevent this outcome from occurring.

There are many different root cause analysis tools. We offer two examples: a **F**ailure **M**odes and **E**ffects **A**nalysis (FMEA) (which builds off of process mapping) and a Pareto chart.

You can access Shift's Pareto Tool here.



Failure Modes and Effects Analysis (FMEA) Template



Pareto Chart Template

Failure Modes and Effects Analysis

A Failure Modes and Effects Analysis (FMEA) is tool that helps teams to identify where problems occur in processes and identify ideas to prevent these breakdowns. This tool builds on the high level process map. Plan at least 45 minutes as a team to complete the FMEA.

For each process step:

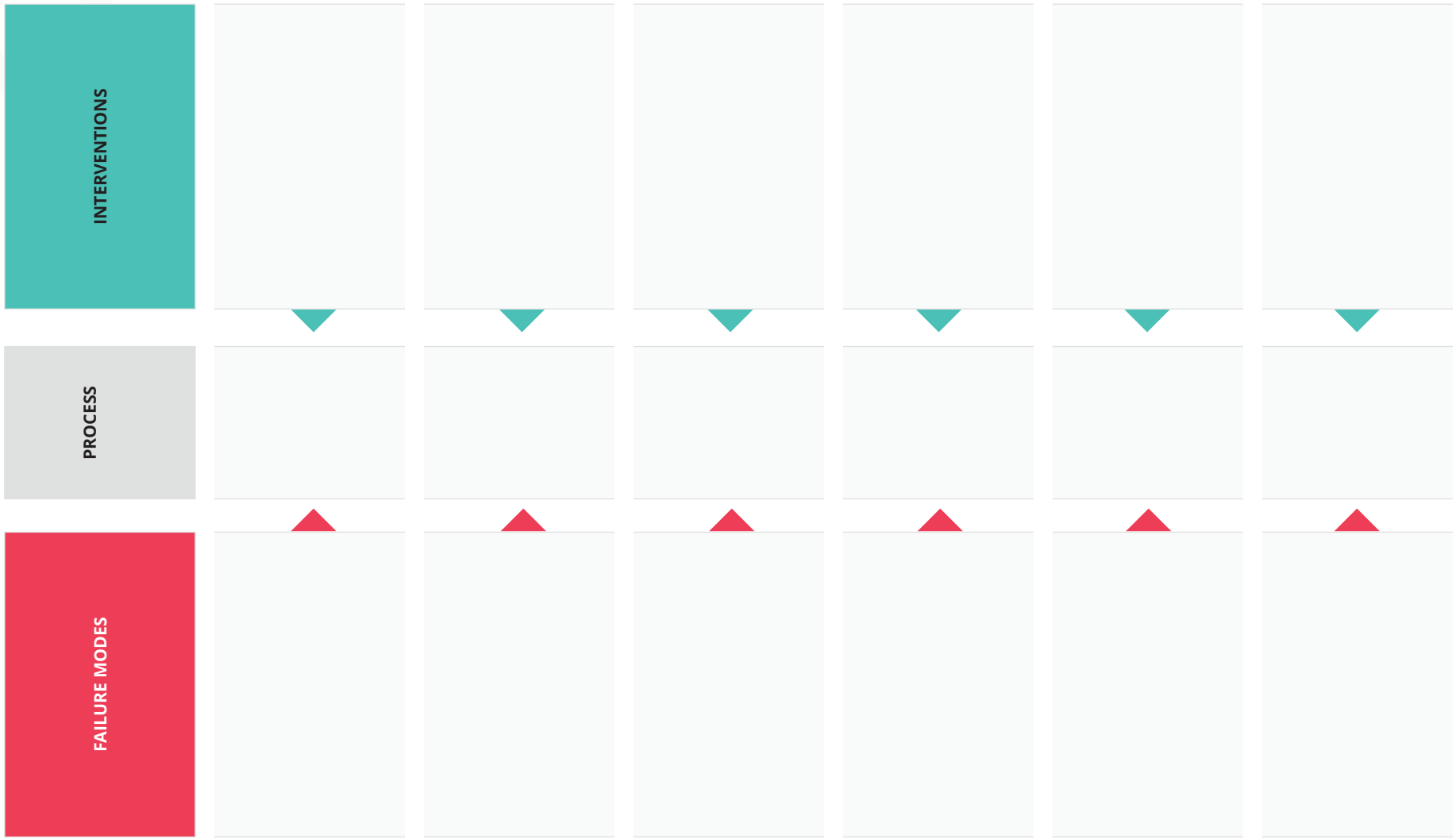
1. Underneath the process step, brainstorm a list of actual or potential breakdowns in that step. We often use red text or marker to illustrate these breakdowns.
2. Above the process step, brainstorm the potential solutions to mitigate the breakdowns. We often use green text or marker to illustrate possible solutions.
3. Repeat with as many process steps as time allows.
4. Check your work! It is important to go out and observe processes in action to further refine the process steps, breakdowns and potential solutions.

This tool can be further strengthened by using data to quantify the frequency of process breakdowns. Data collection can be as simple as a tally sheet or an excel worksheet to record frequency. This could inform the beginning of a Pareto Chart, another root cause analysis tool.

PROCESS						
	School-level teams identify students at risk of becoming chronically absent based on student attendance data, disaggregated by grade, race, and free and reduced lunch status.	Cross-grade teacher teams determine who is the best person to reach out to at risk students' families based on relationship for personalized early outreach.	Point person schedules attendance conference with family to learn more about students' experience of school and about structural barriers preventing attendance, and brainstorm change ideas to resolve them.	Point person holds attendance conference with family and they co-produce a plan address system and family barriers most contributing to absences.	Cross-grade teacher teams re-assess data weekly. If there is one absence, families are contacted for an email or text check-in. If there are two or more absences that week, another attendance conference with family is called.	Student removed from chronic absenteeism risk list after 4 weeks of attendance with 1 absence or less, and student receives recognition for improvement from caring mentors.

INTERVENTIONS **Considering the failure modes for this process:** • What steps can be taken to prevent anything that could go wrong for each step? • How can the causes of identified failure modes be minimized? • What are possible interventions for the identified adverse consequences?	Clear roles for pulling and distributing disaggregated student-level attendance data are established and made transparent within schools.	All teachers have designated FTE to conduct family outreach and/or family liaisons on staff.	Multiple ways to reach families are identified at the start of the school year and are securely on file for each student.	Plan templates are provided, and both identify top reasons for chronic absenteeism in area and leave space for both family-specific reasons and school-specific/ "other" reasons for absence.	Teacher meeting time is protected during standing meetings to specifically check in on chronic absenteeism.	Student improvements are genuinely celebrated by teachers teams, and reminders are set in place to support point of contact in recognizing student improvement.
PROCESS	School-level teams identify students at risk of becoming chronically absent based on student attendance data, disaggregated by grade, race, and free and reduced lunch status. Trigger for a meeting: 4 days absent in a month.	Cross-grade teacher teams determine who is the best person to reach out to at risk students' families based on relationship for personalized early outreach.	Point person schedules attendance conference with family to learn more about students' experience of school and about structural barriers preventing attendance, and brainstorm change ideas to resolve them.	Point person holds attendance conference with family and they co-produce a plan address system and family barriers most contributing to absences.	Cross-grade teacher teams re-assess data weekly. If there is one absence, families are contacted for an email or text check-in. If there are two or more absences that week, another attendance conference with family is called.	Student removed from chronic absenteeism risk list after 4 weeks of attendance with 1 absence or less, and student receives recognition for improvement from caring mentors.
FAILURE MODES • List anything that could go wrong during that step in the process (failure modes). • List all possible causes for each of the failure modes you've identified. • List all possible adverse consequences for each of the failure modes identified	Attendance data are not pulled regularly, and/or are not able to be viewable in a disaggregated fashion.	Person identified as being in closest relationship with students' families does not have sufficient FTE to cover time needed to serve as point of contact for families.	Meeting does not get scheduled.	Plans co-created with families are not aligned with reality, and/or are not followed.	Team does not re-assess students' attendance Teacher teams are unable to reach parents	Students do not receive recognition for improvement from caring mentors.

Failure Modes and Effects Analysis



Attribution: There are many different Failure Modes and Effects Analysis tools and templates. We learned this simplified ersion from Cincinnati Children's Hospital Medical Center.

Pareto Chart

A Pareto Chart is a special type of bar chart that shows how various causes can contribute to an effect. It is based on the Pareto Principle or the "80/20" rule - 80% of an effect comes from 20% of the causes. While the Pareto Principle might not apply as neatly when working on complex issues, it remains a powerful way to focus your efforts on those areas with the greatest impact.

Continuing the earlier examples, the table to the right shows the reasons students and families reported for regularly missing school.

This example was inspired by data shared in a learning event co-hosted by Puget Sound Educational Service District and Shift for school teams through the Office of System and School Improvement. The original data (not shown here) on reasons for school absences in high schools and elementary schools were generated by Lauren Okano, Ph.D MS.ED, Director of Research, Innovation and Data.

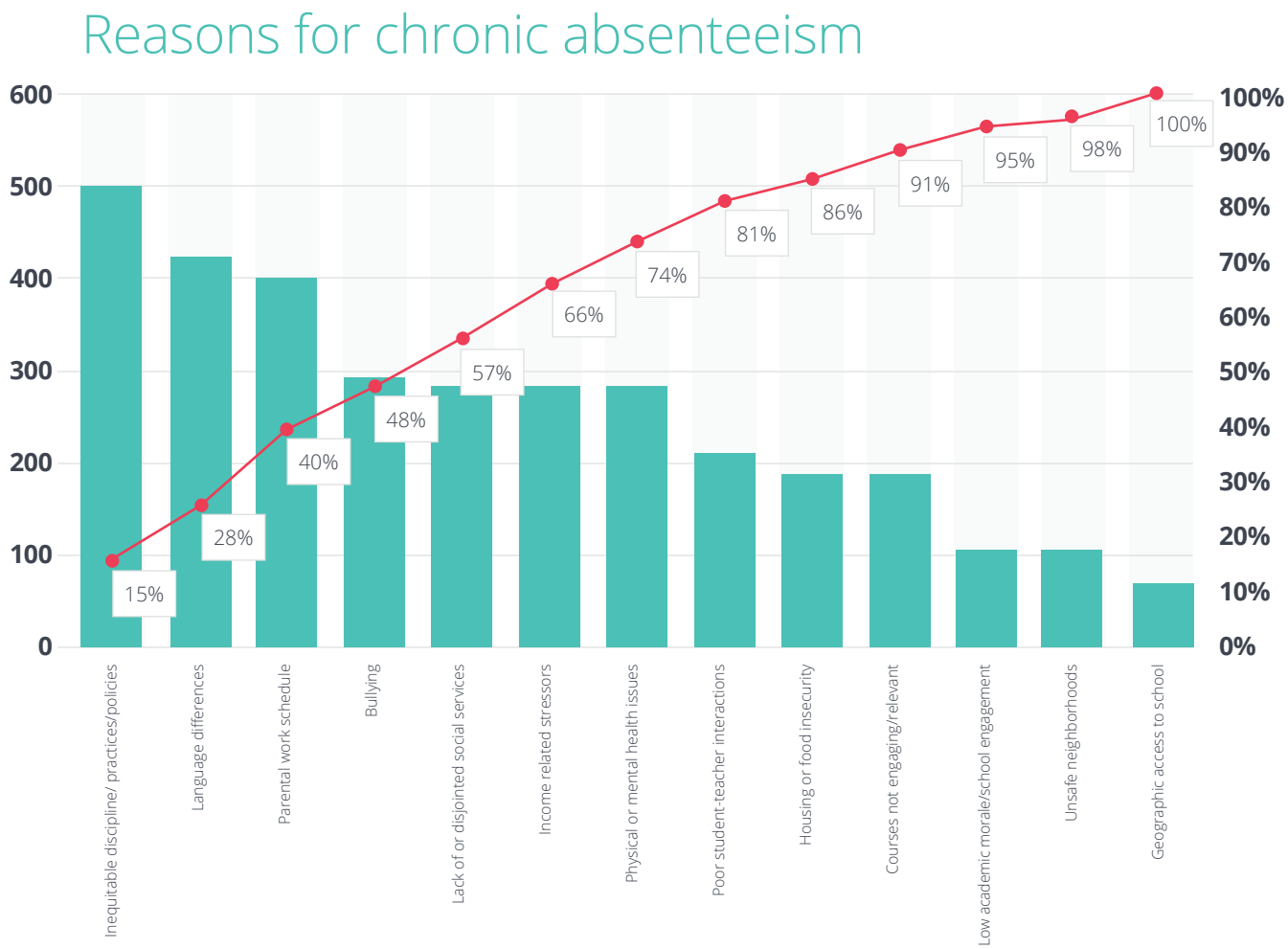
CAUSES	# OF OCCURRENCES	CUMULATIVE %
Inequitable discipline/ practices/ policies	508	15%
Language differences	432	28%
Parental work schedule limits involvement in home and school routine	396	40%
Bullying	288	48%
Lack of or disjointed social services	288	57%
Income related stressors	288	66%
Physical or mental health issues	288	74%
Poor student-teacher interactions	216	81%
Housing or food insecurity	180	86%
Courses not engaging/relevant to student's lived experiences	180	91%
Low academic morale/school engagement	108	95%
Unsafe neighborhoods	108	98%
Geographic access to school	72	100%
TOTAL	**3,352**	

In a Pareto chart, data is collected to evaluate all possible causes to a certain outcome/effect. It is important to rank categories from highest to lowest in frequency in a Pareto data table. Note: If there are many small factors, they can be combined into an "Other" category.

Pareto Chart

NEXT STEPS:

- Find the categories that make up at least 80% ("high impact") of the occurrences.
- As a team, plan how to focus on these categories for your improvement efforts.
- You can visually display these data with one of the many available Pareto chart programs using Excel or use Shift's template here.



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Pareto Chart Template

INSTRUCTIONS:

- Create a simple tally sheet (not shown here) to collect information about the frequency of each category of causes for the problem you want to improve.
- In the first column, list out each of the categories in decreasing order of frequency (from highest to lowest).
- In the next column, enter the corresponding number of occurrences.
- In the third column, calculate the percentage of the total for each category.
- In the last column, working from the highest to the smallest category, calculate the cumulative percentage for each category (to 100%).

CATEGORIES	# OF OCCURRENCES	PERCENT	CUMULATIVE %
TOTAL			