

Rank problems on one declared basis

Construct and interpret a ranking on one declared basis, then distinguish a frequency priority from a severity or causal decision.



The largest count is not automatically the largest loss

Fictional case: Fern Finishing records 50 nonconformities in one inspection window: 24 scratches, 16 burrs, eight missing labels and two other faults. These exact values remain in the core chart. Team leader Rosa wants to choose a starting investigation. A colleague proposes adding estimated repair dollars to the occurrence counts and calling the combined bars an impact score.

Your role and the reference condition

Team leader and quality analyst

Normal: A ranking uses one meaningful unit, a defined observation window and mutually understood categories. The underlying event list remains available for investigation.

Gap: The draft mixes frequency and money and labels the first two categories "80% of our causes". The record contains occurrences, not verified causes.

Work within these conditions

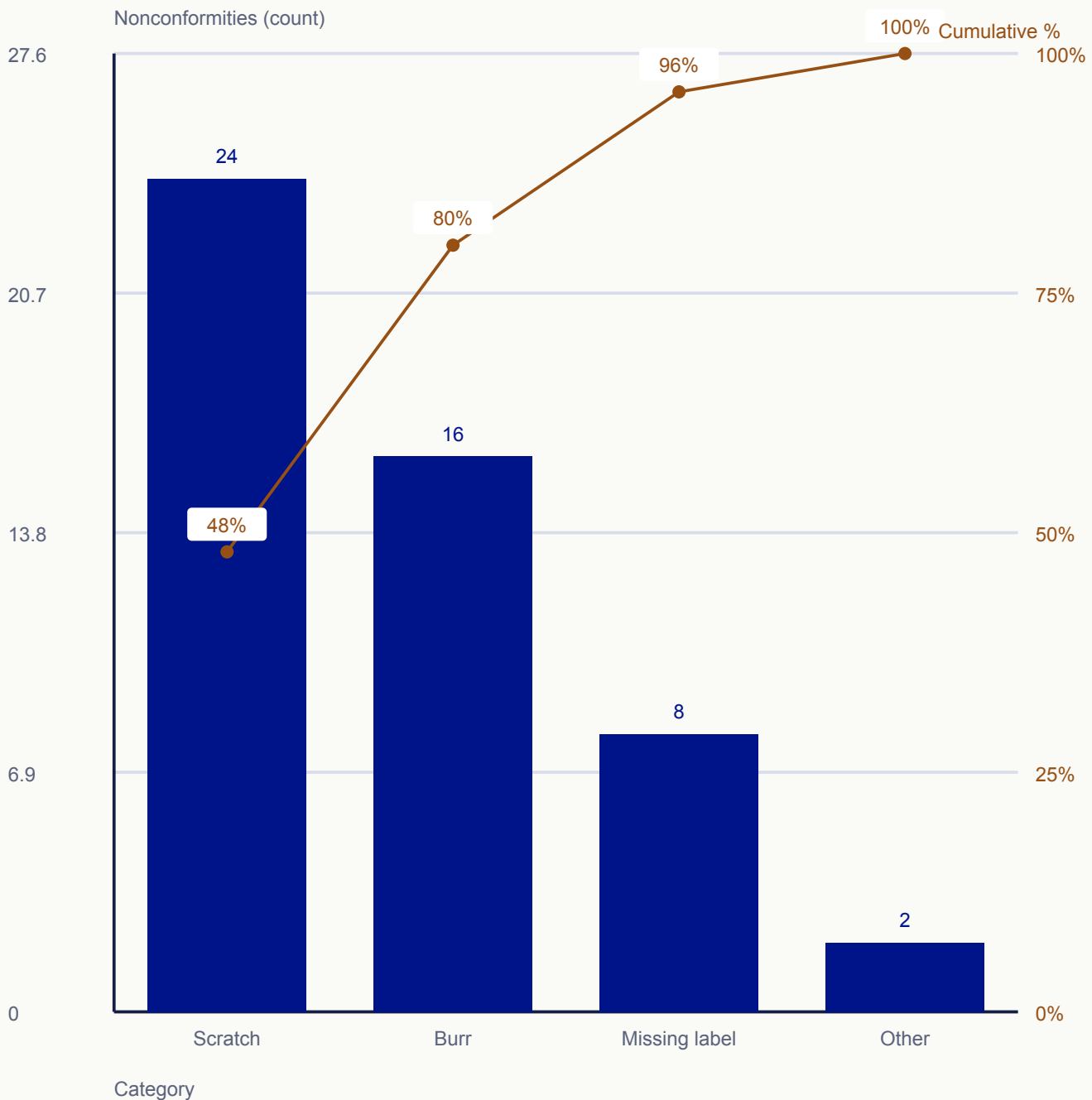
1. The categories describe faults and may involve different mechanisms.
2. A rare severe event may deserve a separate immediate response regardless of rank.

Fictional teaching case. Supplied observations support the exercise; proposed actions are not verified customer results.

See how the method works

A Pareto display ranks categories using one declared basis. Sort the bars from largest to smallest, then calculate cumulative share against the same total. Decide whether the current question concerns frequency, money, time or another burden before drawing the chart. Mixing costs for one category with counts for another produces an invalid ranking. The cumulative line helps show concentration, but it does not promise an eighty-twenty pattern or justify ignoring rare severe events. Use the ranking to select an investigation, then return to the underlying observations and risk context before deciding what to change.

Counts and cumulative contribution



Pareto chart of 50 fictional nonconformities: scratches 24, burrs 16, missing labels 8, other 2. Descending bars use counts; the separate cumulative-percentage axis reaches 48%,80%,96%,100%. The first two categories account for 80% of this example, without establishing a shared cause.

Follow the evidence and decisions

Inspect the supplied case inputs

Category	Count	Illustrative recovery minutes per event
Scratch	24	2
Burr	16	5
Missing label	8	10
Other	2	30

01 / Freeze the question and basis

Rosa writes "Which categories contribute most recorded nonconformity occurrences in this window?" She confirms that all four categories use the same recording rules and the same window.

Why: The ranking becomes reproducible only when its scope and unit are fixed. A category total cannot be compared with another that covers a different period or population.

Evidence / check: The title says occurrence count and names the window.

02 / Order and reconcile the bars

She sorts counts in descending order: 24, 16, 8, 2. The sum is 50. She checks that every logged event belongs to one reported category or is explicitly handled under the collection rule.

Why: Sorting changes display order, not the underlying evidence. A missing category would distort every later cumulative percentage.

Evidence / check: The category total reconciles to fifty recorded nonconformities.

03 / Calculate the cumulative line

Cumulative counts are 24, 40, 48 and 50. Dividing each by 50 gives 48%, 80%, 96% and 100%. The line uses its own percentage axis.

Why: The first two bars happen to reach 80% in this dataset. That is an observation, not a rule that the plotting process must force.

Evidence / check: The native chart retains count bars and a labelled cumulative-percentage axis.

04 / Compare a different decision separately

For recovery effort, she creates a separate minutes calculation: 48, 80, 80 and 60 minutes. Total estimated recovery is 268 minutes; burrs and missing labels tie for the largest time burden.

Why: Multiplying count by an explicitly illustrative per-event duration changes the question. It shows why a frequency ranking need not be the correct priority for every objective.

Evidence / check: A second record states minutes, assumptions and its different order; no mixed-unit score is created.

05 / Choose investigation without inventing cause

Rosa selects scratches for a frequency-focused observation study and flags any severe exceptions through the existing response process. She keeps the rival time-based priority visible for the resource decision.

Why: A category name does not explain why the fault occurs. The next work must locate conditions, test explanations and verify the consequence of an action.

Evidence / check: The decision record says priority for investigation, with cause still unverified.

Completed frequency-priority record

Rank by frequency	Count / cumulative share	Next interpretation
Scratch	24 / 48%	Largest occurrence category
Burr	16 / 80%	First two account for 40 of 50
Missing label	8 / 96%	Lower frequency; may consume more time per event
Other	2 / 100%	Review severity separately

A rare event is severe

One of the two "other" events involves a potentially significant product risk.

Decision

Use the applicable immediate escalation and containment process while retaining the descriptive frequency ranking. Do not wait for its bar to become large.

Reasoning

Frequency is one decision dimension. A Pareto chart does not authorize ignoring a severe low-frequency condition.

What would change the decision?

The action log records the risk response independently of the improvement-priority list.

Practise with a changed case

A changed ranking with a tie

New fictional week: scratches 12, burrs 18, missing labels 6, other 4. Each event belongs to one category. Recovery minutes per event remain 2, 5, 10 and 30 for this exercise only.

Category	Count
Scratch	12
Burr	18
Missing label	6
Other	4

Your task

1. Order the frequency bars and calculate all cumulative percentages.
2. Calculate the separate recovery-minute totals and identify the largest burden.
3. Write one defensible priority statement without claiming a cause.

Use the next page to record your reasoning before reading the answer.

Your practice worksheet

A changed ranking with a tie

Declared basis and window

Sorted counts

Cumulative calculation

Separate time calculation

Priority and remaining evidence

Complete your reasoning before turning to the answer. Use the separate learner workbook for group practice.

Check your reasoning and transfer it

1. Forty events sort as burr 18, scratch 12, missing label 6, other 4. Cumulative percentages are 45%, 75%, 90% and 100%.
2. Recovery minutes are scratch 24, burr 90, missing label 60 and other 120, total 294. "Other" is the largest time burden despite the lowest frequency. A team may investigate burr frequency and separately examine the high-time "other" work.

Suggested completed record

Frequency rank	Count	Cumulative percentage
Burr	18	45%
Scratch	12	75%
Missing label	6	90%
Other	4	100%

Plausible wrong turns

1. The first two categories need not equal 80%.
2. A category priority is not a verified cause or an instruction to ignore severity.

Evidence of a sound answer

1. Reconcile 40 events and 294 minutes separately.
2. Explain why the two priority lists differ.
3. Retain the illustrative-duration assumption.

Take the learning back to work

Commitment	Agreed follow-through
Owner	Quality analyst and improvement sponsor
Record	Ranked source-linked chart plus bounded investigation decision
Review	At each comparable reporting window
Verification evidence	Same basis, complete categories and actual investigation evidence
If unresolved	Revisit collection definitions or choose a different basis when the decision question changes.

Help someone else apply the method

Prepare

1. Count cards
2. Blank cumulative table
3. Separate minutes worksheet

Minutes	Activity and coaching prompt
4	Name the question Which unit is being ranked?
8	Build the two records Why must minutes not be added to counts?
10	Complete the changed week Where does the cumulative line finish and why?
5	Debrief the severe exception Which decision is outside this frequency chart?

Debrief

1. Ask a learner to defend a time-focused priority without altering the count chart.
2. Require a plain-language statement of the uncertainty behind per-event durations.

Individual or remote practice

Sort paper category cards, calculate cumulative totals, then open the answer.

Connect the method and check its boundaries

Before application

1. One comparable ranking basis
2. A common observation window

Outside this lesson

1. Proof of a shared cause
2. Automatic treatment of severe rare risks

ASQ: Pareto chart

ASQ: Pareto chart

Rank category totals on one stated measurement basis; cumulative percentages are optional and end at 100%.

Public primary-source summary; underlying paid standards/forms are not reproduced.

[Open this lesson and its visual aids](#)