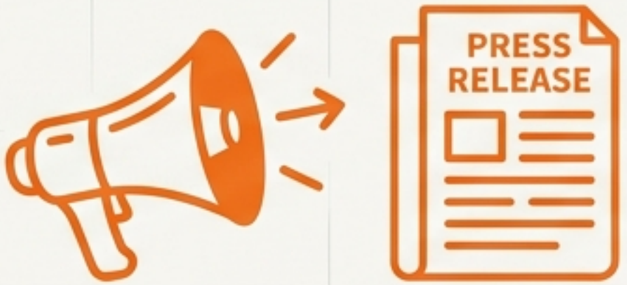
The Within 1% Illusion

Deconstructing the statistical inference chain of Michigan's 2020 Risk-Limiting Audit.

The Public Perception

A formal statistical guarantee.

The Reality

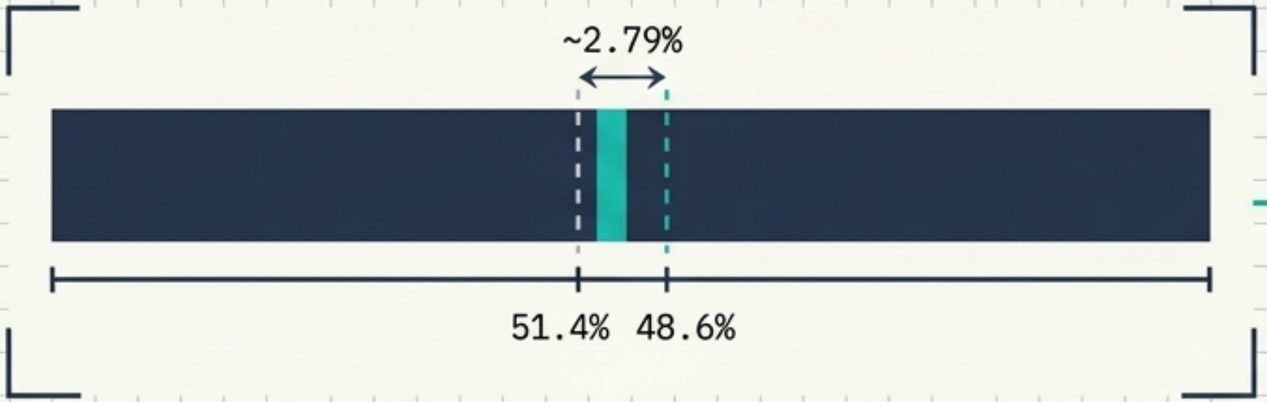


A descriptive PR observation.

How a failure to complete a formal mathematical audit was repackaged as a confirmed statistical victory.

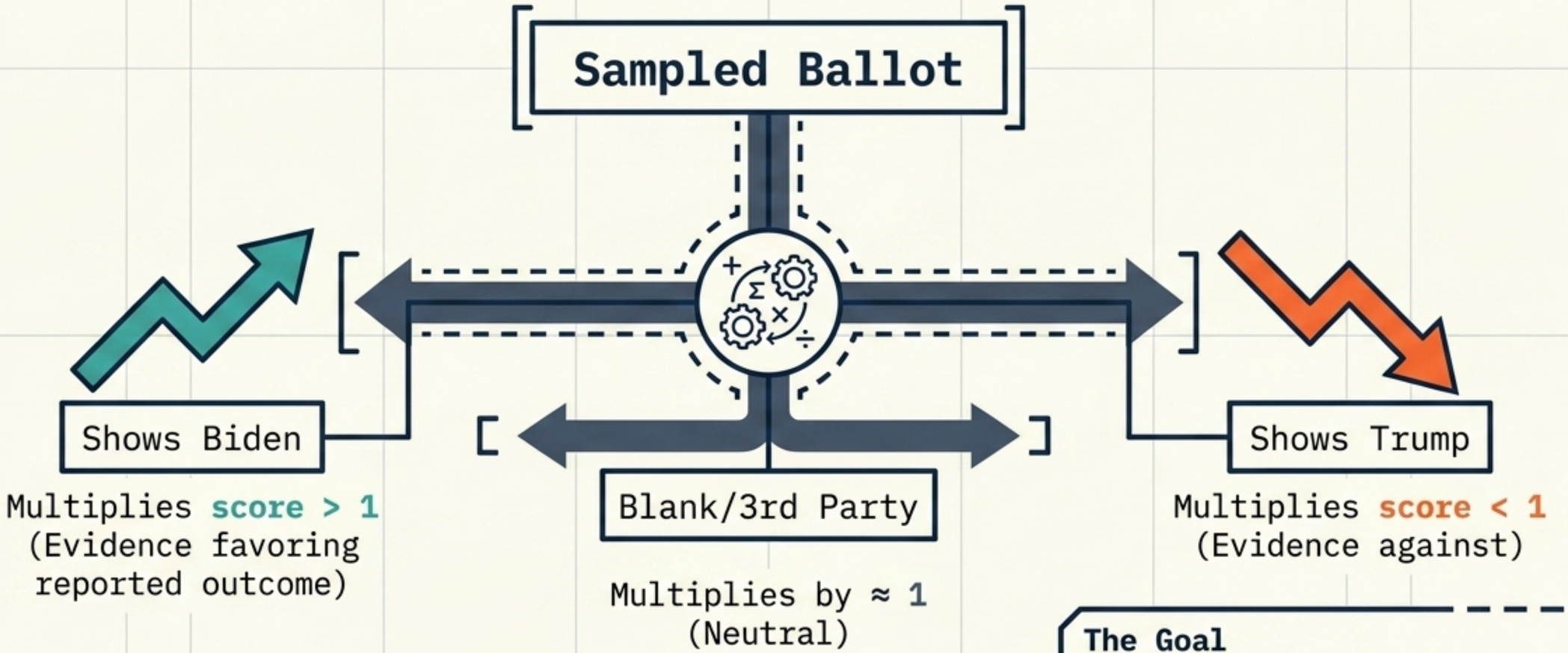
The Mathematical Starting Line

Total Ballots Cast	Certified Margin	Diluted Margin
~5.54 Million	154,188 votes	~2.79% Biden 51.4% / Trump 48.6%



Because the diluted margin (the reported winner's margin expressed as a fraction of all ballots cast) was so narrow, a large sample size of ~18,000 ballots was mathematically required.

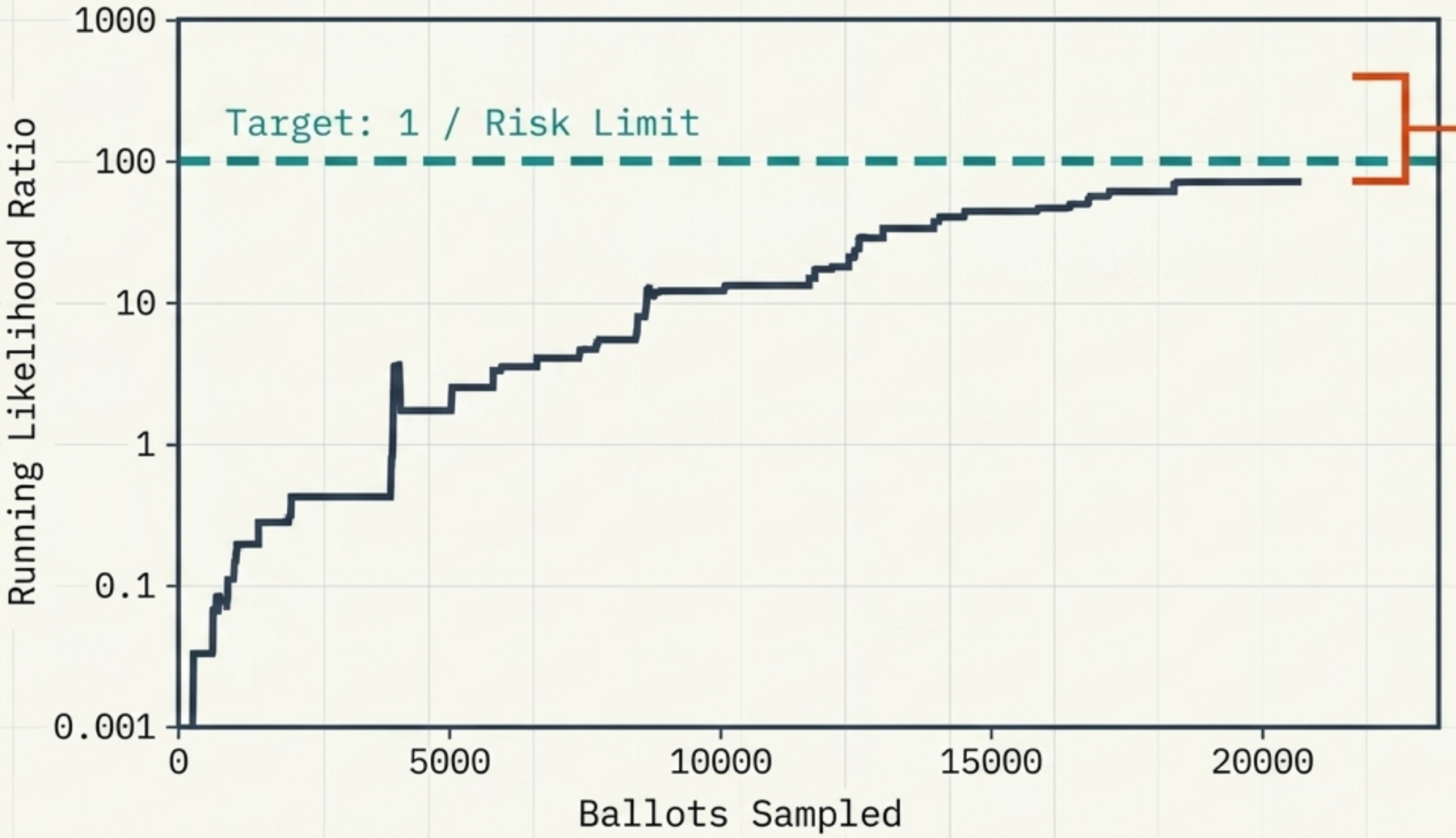
The Ideal Engine: How a Risk-Limiting Audit Works



The Goal

Define the Null Hypothesis:
"The reported winner actually lost."
The engine's job is to accumulate enough evidence to mathematically reject this hypothesis.

The Threshold of Proof (And Where It Stopped)



78 missing ballots prevented the score from crossing the threshold. The formal mathematical audit could not complete.

The Pivot: Substituting Description for Math

Certified Results	Manual Sample Tally (18,084 ballots)
51.4% Biden / 47.0% Trump	~50% Biden / ~48% Trump

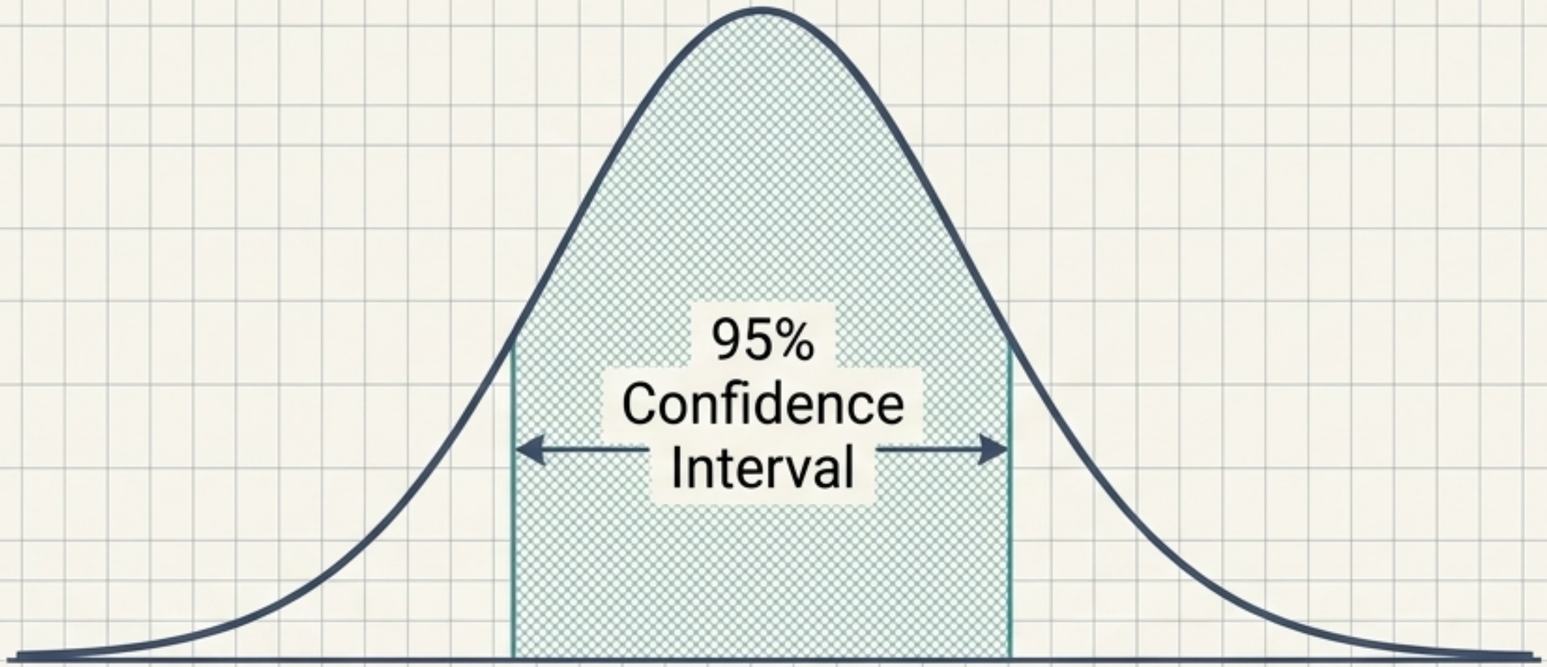
| sample_pct - certified_pct | < 1%

This is a descriptive observation, not a statistical test output. It was generated by a communications office comparing two proportions, entirely separate from the Arlo RLA software.

Diagnostic Matrix: Fact vs. Fiction

The Claim	What It Actually Means	Statistical Validity
Risk limit was met	Running BRAVO score exceeded 1/risk_limit	 Never confirmed – 78 missing ballots prevented this.
Results within 1%	Sample percentage ≈ certified percentage	 Descriptive observation only – not a formal statistical test.

The Margin of Error Problem (Statewide)



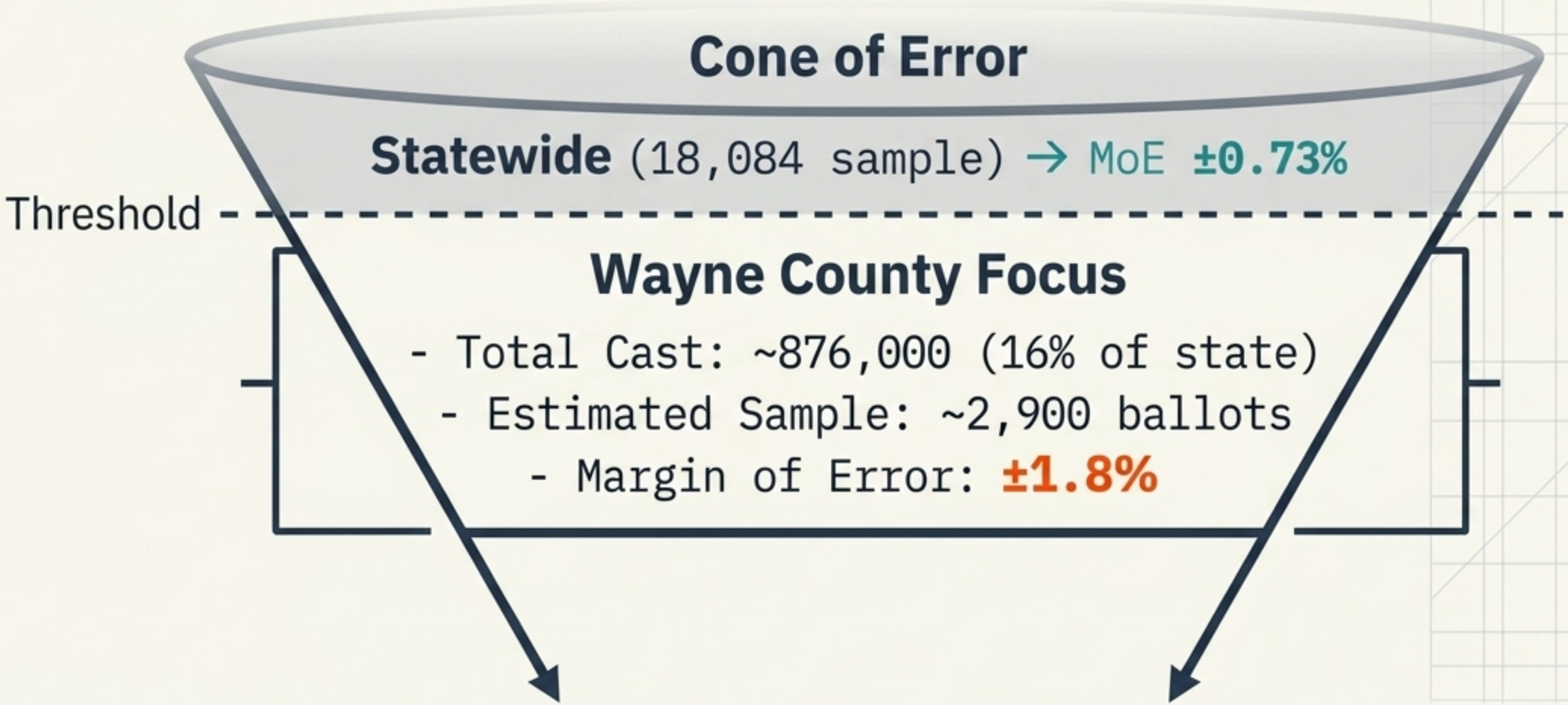
$$\pm 1.96 * \sqrt{\frac{0.514 * 0.486}{18084}} \approx \pm 0.73\%$$

The “within 1%” finding is not proof of exact precision.

It is entirely expected within the normal sampling error of an 18,084 sample applied to a 51.4/48.6 split.

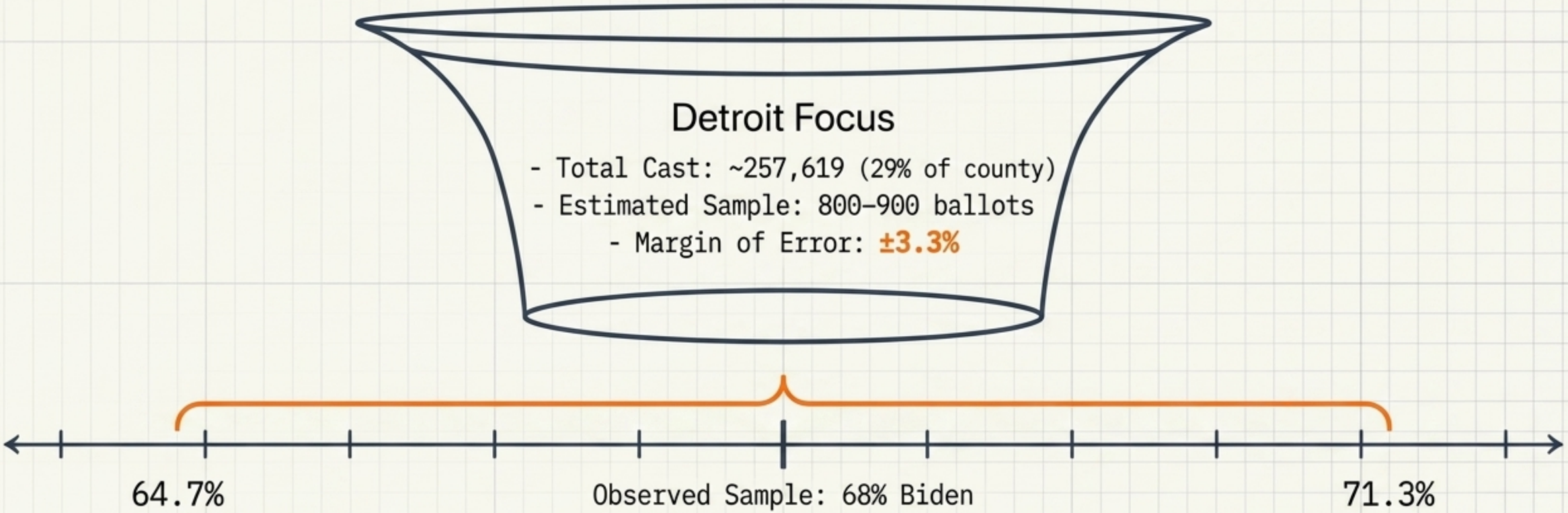
Even if the true result were off by 0.7%, it would still register as “within 1%”.

The Local Disconnect: Wayne County



The “1% tolerance” claim becomes mathematically meaningless at the county level because the local margin of error (1.8%) immediately swallows the 1% threshold.

The Local Disconnect: Detroit



An observed sample result of “68% Biden” in Detroit is statistically consistent with true results ranging wildly from 64.7% to 71.3%. The sample is vastly too small to confirm local accuracy within 1%.

What “Within 1%” Does Not Tell You

Local Accuracy

Does not confirm whether the certified totals were accurate at the local AVCB (Absentee Voter Counting Board) level.

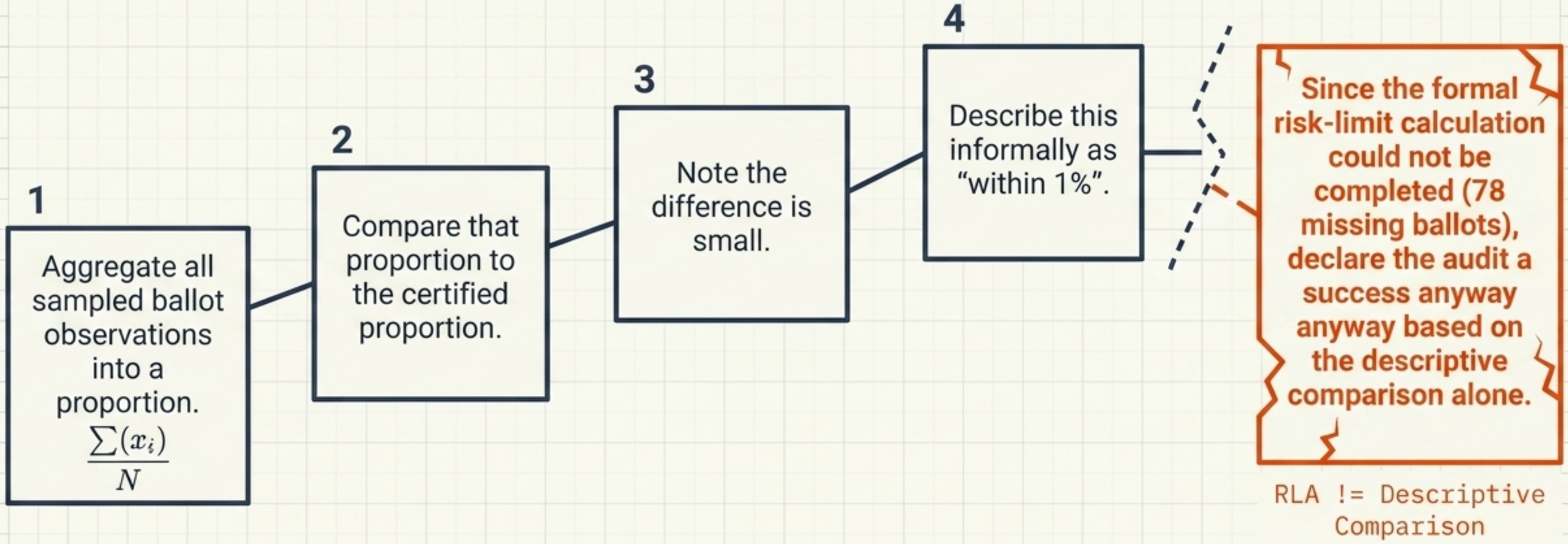
True Randomness

Does not prove the sample was genuinely random, given that clerks retrieved their own ballots.

Meaningful Tolerance

Ignores the statistical reality that a 1% tolerance is entirely subsumed by the margin of error at local levels.

The Broken Inference Chain



The Illusion of Rigor

$$\sum > \frac{1}{\alpha} \neq$$

A true Risk-Limiting Audit requires a formal statistical guarantee. In Michigan's 2020 audit, a descriptive "close enough" statement was substituted for rigorous mathematical proof—and communicated publicly as if the math had been completed.