Diagnostic Accuracy Calculator

User Guide

TRUST Research Center
trustresearch.org

This guide provides step-by-step instructions for using the TRUST Diagnostic Accuracy Calculator. It covers both data-entry pathways, all output measures with their statistical meaning, how to read the probability meter, and worked examples illustrating every possible clinical decision scenario.

SECTION 1 — OVERVIEW OF THE CALCULATOR

What Does This Calculator Do?

The TRUST Diagnostic Accuracy Calculator computes a full set of diagnostic test performance measures from either a 2×2 contingency table or directly entered test parameters. Outputs include sensitivity, specificity, PPV, NPV, accuracy, likelihood ratios (+LR, -LR), diagnostic odds ratio (DOR), and post-test probabilities — all with 95% confidence intervals.

A visual probability meter illustrates how test results shift disease probability. When decision thresholds are entered, the tool also recommends a clinical action (treat, investigate, or discharge).

Key Features

- Two entry modes: contingency table OR sensitivity/specificity/prevalence
- 95% confidence intervals for all key measures when cell counts are available
- Visual probability meter with color-coded CI zones and decision icons
- Clinical decision support via testing and treatment thresholds
- Export as high-resolution PNG (meter) or full PDF report
- Usage counter and feedback widget
- Dynamic citation with today's access date and accordion reference list

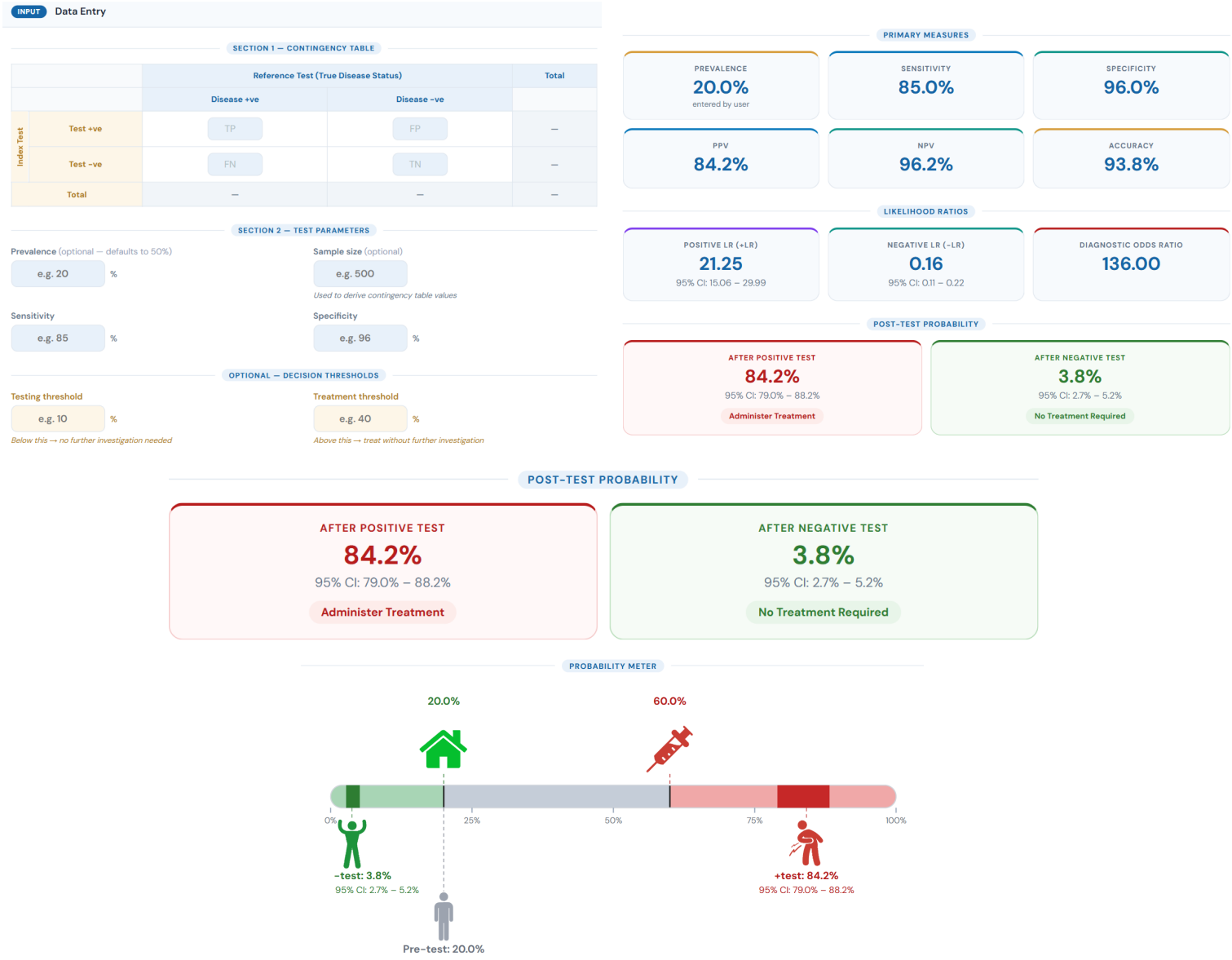

Figure 1. The four main areas of the Diagnostic Accuracy Calculator.

SECTION 2 — DATA ENTRY: CONTINGENCY TABLE

Using the Contingency Table (Section 1)

The contingency table is the primary entry method when you have raw counts from a diagnostic study. Enter TP, FP, FN, and TN. Row and column totals update automatically as you type.

Cell Definitions

Cell	Full Name	Description
TP	True Positive	Test POSITIVE and patient HAS disease
FP	False Positive	Test POSITIVE but patient DOES NOT have disease (Type I error)
FN	False Negative	Test NEGATIVE but patient HAS disease (Type II error)
TN	True Negative	Test NEGATIVE and patient DOES NOT have disease

Worked Example: Biomarker Test for Liver Disease

1,000 patients tested; 160 confirmed disease-positive by biopsy. Results: 136 TP, 34 FP, 24 FN, 806 TN.

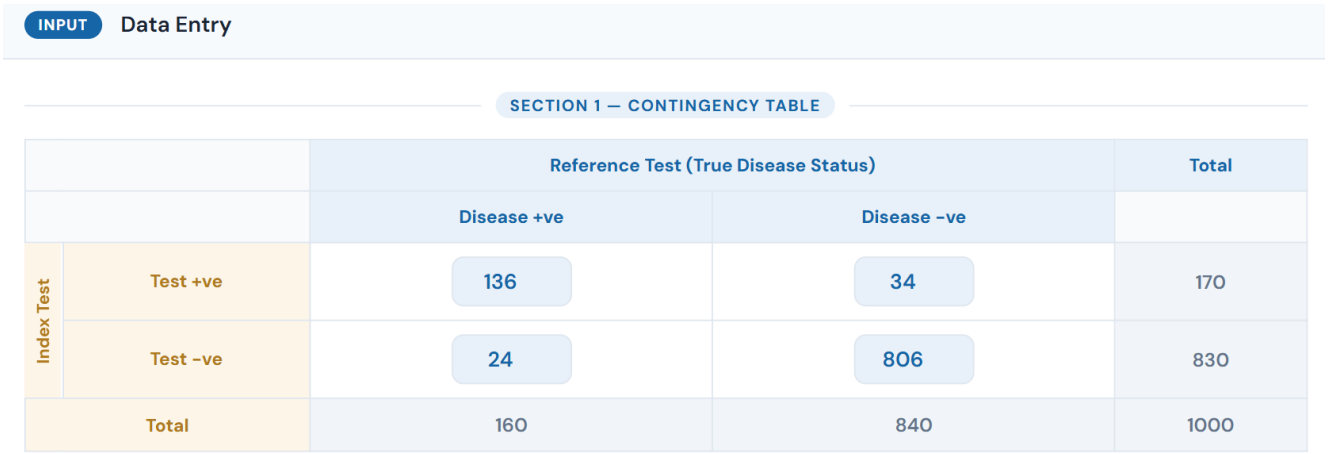

Figure 2. Contingency table (Section 1) filled with the worked example: 136 TP, 34 FP, 24 FN, 806 TN (N=1000). Totals update automatically.

Tip: If only Section 1 is filled, sensitivity and specificity are calculated directly from the cell counts. Prevalence is derived as (TP+FN)/N.

Note: 95% CIs for Sensitivity, Specificity, PPV, and NPV are only available when cell counts are entered in Section 1.

SECTION 3 — DATA ENTRY: TEST PARAMETERS

Using Sensitivity, Specificity and Prevalence (Section 2)

When raw cell counts are unavailable (e.g. using published test-performance figures), enter parameters directly in Section 2. The calculator automatically derives a virtual contingency table for CI calculations.

Field	Required?	Default if blank	Example
Prevalence	Optional	50% assumed	16%
Sensitivity	Required*	—	85%
Specificity	Required*	—	96%
Sample size	Optional	N=1000 (internal)	1000

** At least Sensitivity and Specificity must be entered if using Section 2.*

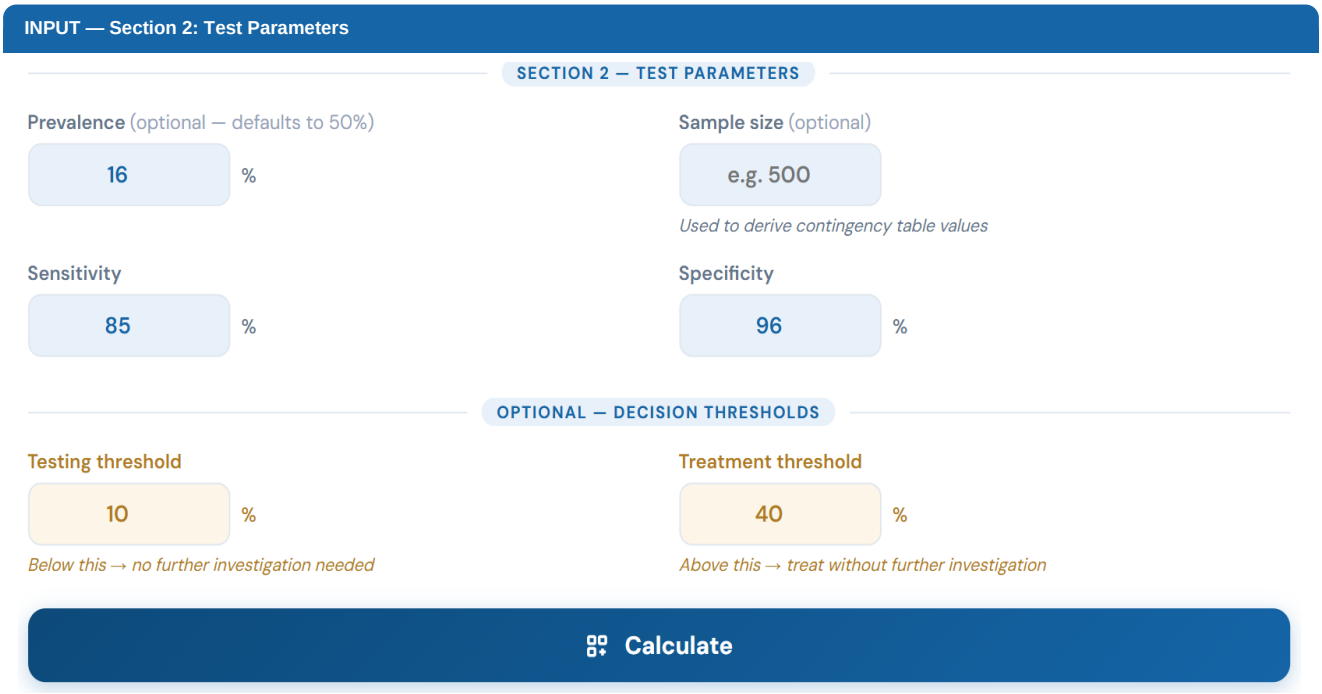

Figure 3. Section 2 with Prevalence 16%, Sensitivity 85%, Specificity 96%, Testing threshold 10%, Treatment threshold 40%.

Tip: Both sections can be used simultaneously. If Section 1 is filled, it provides sensitivity and specificity. Prevalence entered in Section 2 always overrides the table-derived value.

SECTION 4 — DECISION THRESHOLDS

Testing and Treatment Thresholds

When both thresholds are entered the meter shows color-coded zones and the calculator produces a clinical recommendation for each result.

Threshold	Definition	Zone color
Testing threshold	Disease probability below which the clinician is confident the disease is absent — no further investigation needed. Green (left)	
Treatment threshold	Disease probability above which the clinician is confident enough to treat directly without further workup.Red (right)	
Between thresholds	The "testing zone" — diagnostic uncertainty remains; the test result should guide management. Grey (middle)	

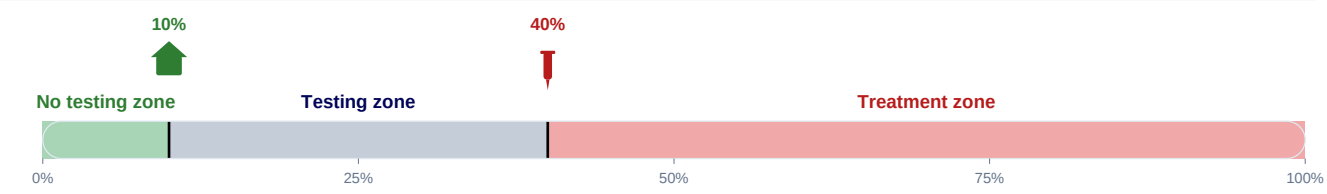

Figure 4. Probability bar zones with testing threshold (10%) and treatment threshold (40%).

SECTION 5 — UNDERSTANDING THE RESULTS

Results Panels

After clicking Calculate, three panels appear. Example: Prevalence 16%, Sensitivity 85%, Specificity 96%, N=1000.

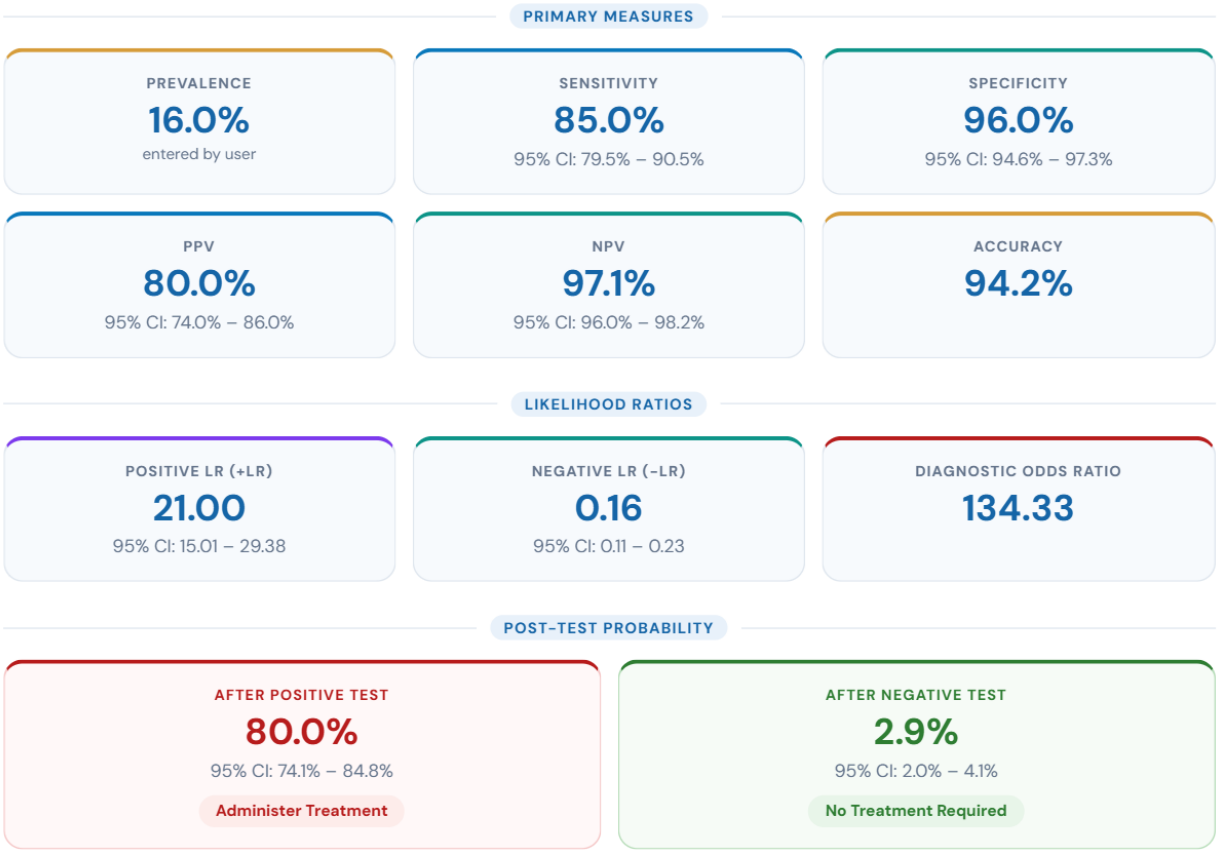

Figure 5. Full results panel: Prevalence 16%, Sensitivity 85%, Specificity 96%, N=1000.

What Each Measure Means

Measure	Formula	Interpretation
Sensitivity	TP / (TP+FN)	Proportion of disease-positive patients correctly identified. High sensitivity = few missed cases (low false-negative rate).
Specificity	TN / (TN+FP)	Proportion of disease-negative patients correctly identified. High specificity = few false alarms (low false-positive
PPV	TP / (TP+FP)	Probability that a positive result truly indicates disease. Rises with higher prevalence.
NPV	TN / (TN+FN)	Probability that a negative result truly indicates absence of disease. Falls with higher prevalence.
Accuracy	(TP+TN) / N	Overall correct classification rate. Can be misleading when prevalence is very high or very low.
+LR	Sensitivity / (1-Specificity)	How much a positive result multiplies the pre-test odds of disease. >10: strong evidence for disease; 5-10: moderate; 2-5: small; <2: negligible.
-LR	(1-Sensitivity) / Specificity	How much a negative result multiplies the pre-test odds of disease. <0.1: strong evidence against disease; 0.1-0.2: moderate; 0.2-0.5: small.
DOR	+LR / -LR	Single discrimination summary. Higher = better. Unaffected by prevalence.
Post-test (+ve)	pre-odds x +LR	Revised probability of disease after a positive test result.
Post-test (-ve)	pre-odds x -LR	Revised probability of disease after a negative test result.

SECTION 6 — PROBABILITY METER: NO THRESHOLDS

Reading the Probability Meter (Basic Mode)

Without thresholds the bar is white. The CIs are shaded in solid blue (positive result) and gold (negative result). Three person icons mark key probabilities.

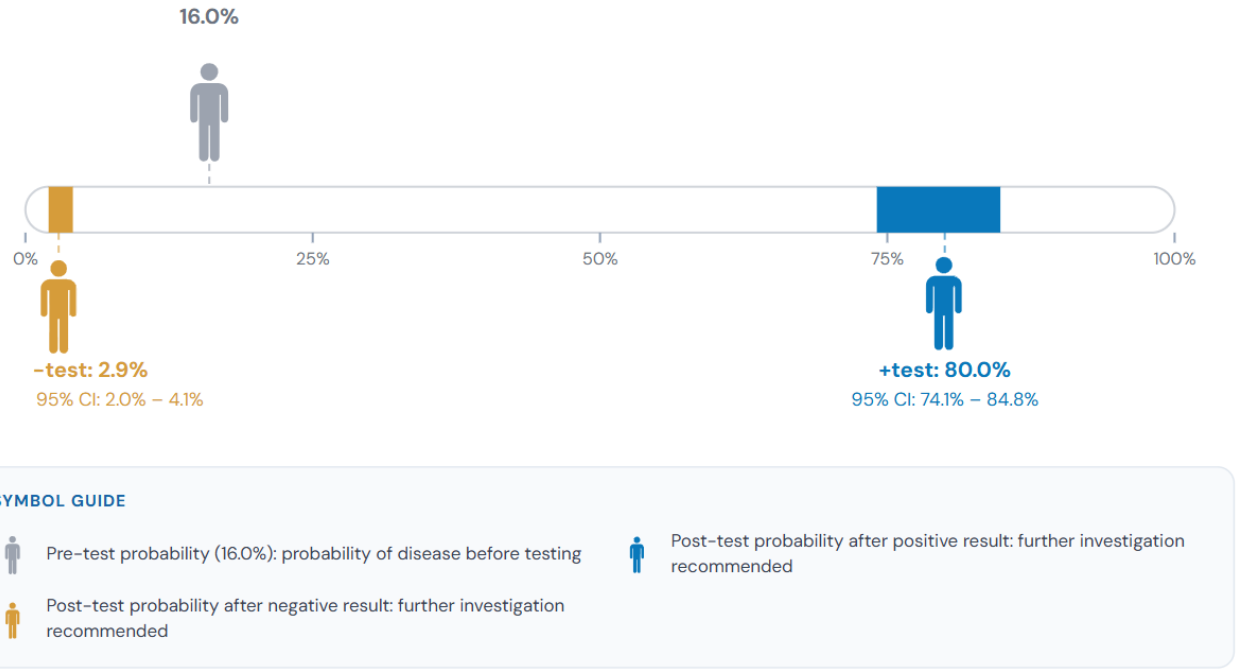

Figure 6. Basic probability meter: pre-test 16% (grey), post-test after positive 80% (blue CI), post-test after negative 2.9% (gold CI). No thresholds.

Symbol Guide

Symbol	Colour	Position	Meaning
Standing person	Grey	Above bar	Pre-test probability (prevalence)
Standing person	Blue (#0978BB)	Below bar	Post-test prob (positive result) — uncertain/investigate
Standing person	Gold (#D69C3A)	Below bar	Post-test prob (negative result) — uncertain/investigate
Sick person (lying)	Dark red	Below bar	Post-test (positive): CI entirely above treatment threshold → Administer Treatment
Healthy person	Dark green	Below bar	Post-test (negative): CI entirely below testing threshold → No Treatment Required
House	Green	Above bar	Testing threshold marker
Syringe	Red	Above bar	Treatment threshold marker
Solid shaded zone	Blue or dark red	On bar	95% CI of post-test probability for positive result
Solid shaded zone	Gold or dark green	On bar	95% CI of post-test probability for negative result

SECTION 7 — PROBABILITY METER: CLINICAL DECISIONS

Three Clinical Scenarios

When thresholds are entered, each post-test CI is compared against the thresholds to produce a clinical recommendation. All combinations are illustrated below.

Test result	CI position relative to threshold	Decision	Icon shown
Positive result	Entire CI above treatment threshold	Administer Treatment	Sick person (dark red)
Positive result	CI spans threshold or below treatment threshold	Further investigation	Blue standing person
Negative result	Entire CI below testing threshold	No treatment required	Healthy person (dark green)
Negative result	CI spans threshold or above testing threshold	Further investigation	Gold standing person

Scenario A — Treat after positive | Safe after negative

Parameters: Prevalence 16%, Sensitivity 85%, Specificity 96%, Testing threshold 10%, Treatment threshold 40%. Positive result CI (dark red, 70.5%-81.4%) lies entirely above 40% — Administer Treatment. Negative result CI (dark green, 2.0%-4.2%) lies entirely below 10% — No Treatment Required.

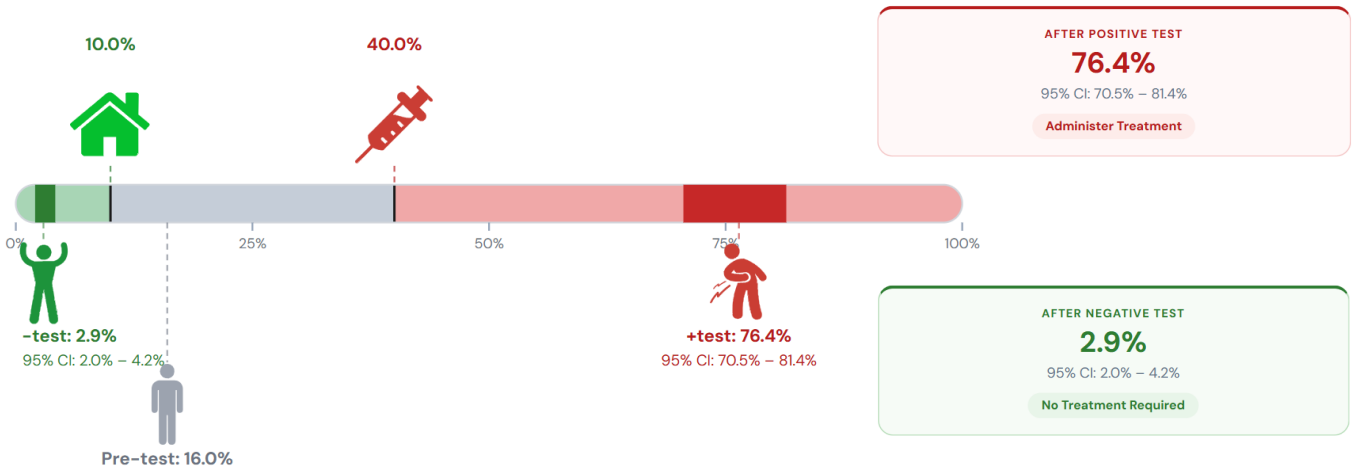

Figure 7. Scenario A: Both decisions are unambiguous. Dark red CI above treatment threshold → treat. Dark green CI below testing threshold → safe.

Scenario B — Further investigation required for both

Parameters: Prevalence 30%, Sensitivity 70%, Specificity 75%, Testing threshold 15%, Treatment threshold 55%. The+LR is modest (2.8). Both CIs span their respective thresholds — further investigation recommended for both results.

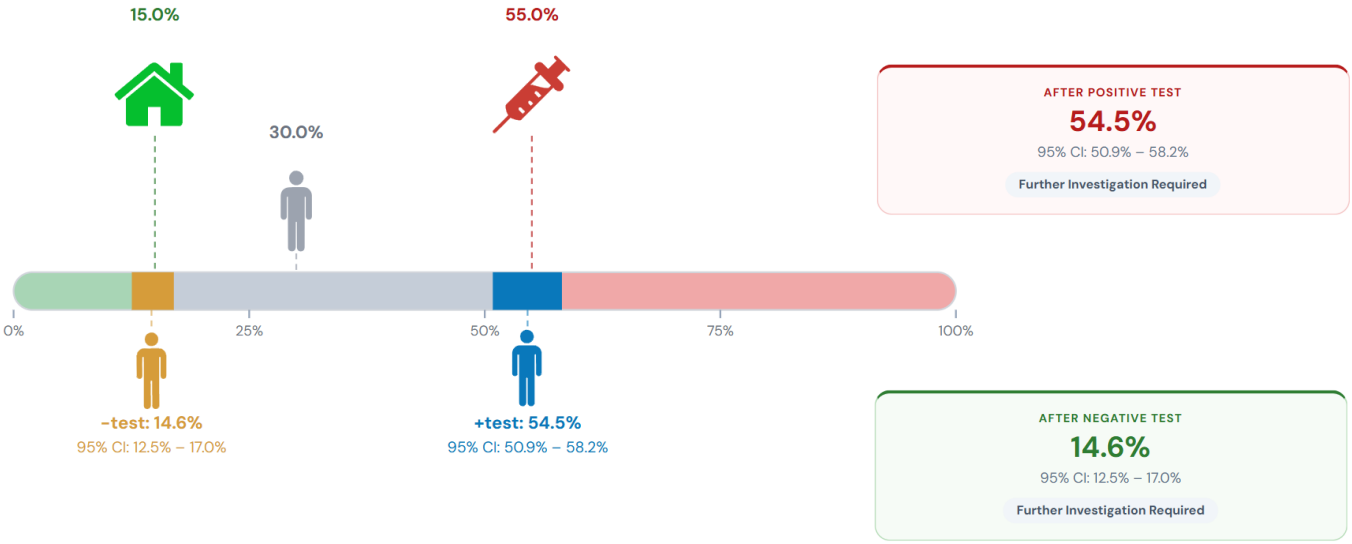

Figure 8. Scenario B: Both CIs span their thresholds. Blue CI (positive) and gold CI (negative) indicate ongoing uncertainty — investigate further.

Scenario C — Treat after positive | Investigate after negative

Parameters: Prevalence 30%, Sensitivity 90%, Specificity 85%, Testing threshold 5%, Treatment threshold 60%. Positive CI (dark red, 68.2%-75.5%) is entirely above 60% → treat. Negative CI (gold, 3.5%-6.6%) spans the 5% testing threshold → investigate.

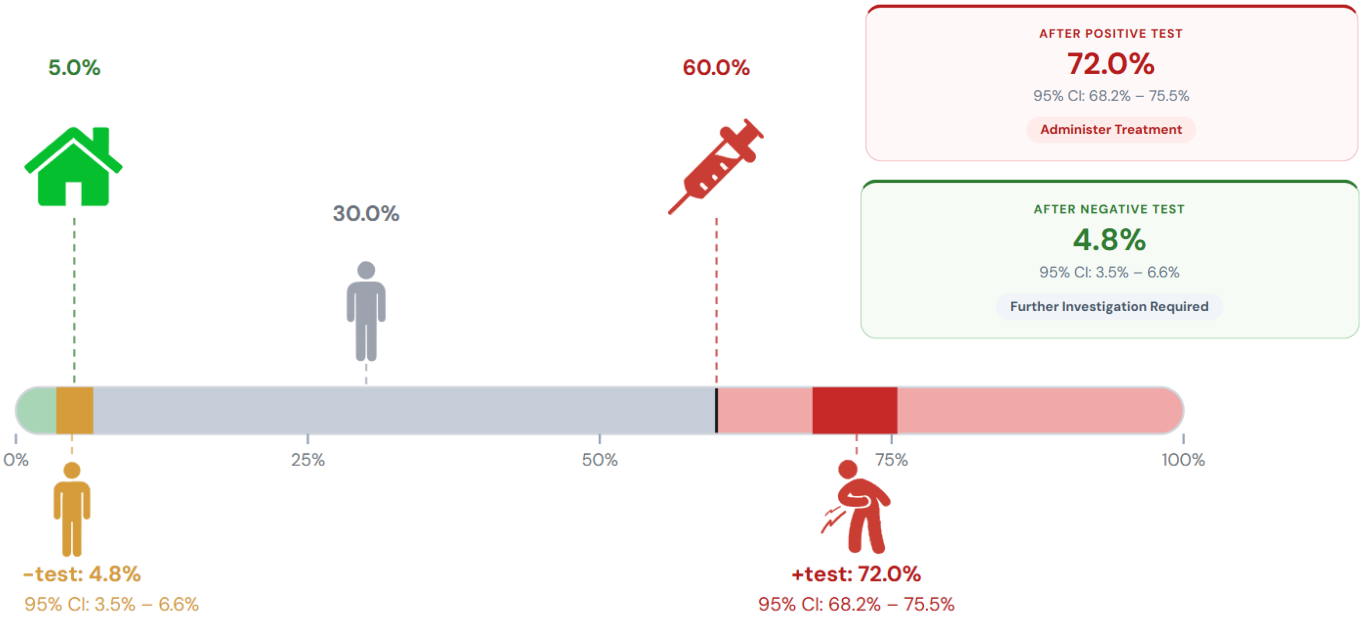

Figure 9. Scenario C: Dark red CI above treatment threshold → treat. Gold CI spans the testing threshold → further investigation.

SECTION 8 — EXPORTING RESULTS

Save Meter as PNG

Click **Save Meter as PNG** (left button below the meter) to download the probability meter as a high-resolution PNG (2× pixel density, 30px white border on all sides). Ideal for inserting into presentations, reports, or publications.

Export PDF Report

Click **Export PDF Report** (right button) to generate a full A4 branded PDF:

- TRUST header with logo and report date
- Full contingency table
- All measures with 95% CIs
- Probability meter graphic
- Auto-generated interpretation (sensitivity quality, LR shifts, post-test probabilities, clinical decision)
- Company contact details in the footer (phone, email, website, social media)

Tip: Review the auto-generated interpretation before sharing — confirm it matches your clinical context.

Note: The PDF is generated entirely in your browser. No data is sent to any server.

SECTION 9 — CITATION AND REFERENCES

How to Cite This Calculator

Scroll to the bottom of the page. The "How to cite this page" box shows a ready-to-use citation with the current access date automatically filled in. Click **Copy citation** to copy it to your clipboard:

> *TRUST Research Center. (2026). Diagnostic accuracy calculator. (https://trustresearch.org/TRUST-Calculators/diagnostic-accuracy-calculator.html; accessed 13 May 2026)*

References

1. Altman DG, Machin D, Bryant TN, Gardner MJ (Eds) (2000). *Statistics with confidence*, 2nd ed. BMJ Books.

2. Mercaldo, N. D., Lau, K. F., & Zhou, X. H. (2007). Confidence intervals for predictive values with an emphasis to case-control studies. *Statistics in Medicine*, 26(10), 2170-2183.

3. Monaghan, T. F., Rahman, S. N., Agudelo, C. W., et al. (2021). Foundational statistical principles in medical research: sensitivity, specificity, PPV, and NPV. *Medicina*, 57(5), 503.

4. Hassouna, A. (2023). *Statistics for Clinicians: How Much Should a Doctor Know?* Springer Nature.

5. Zhou, X. H., Sun, J., Pennello, G. A., et al. (2026). *Statistical methods in diagnostic medicine.* John Wiley & Sons.

QUICK REFERENCE SUMMARY

At-a-Glance Guide

Task	How
Enter cell counts	Fill TP, FP, FN, TN in Section 1 — totals update automatically
Enter test parameters	Fill Sensitivity + Specificity (+/- Prevalence) in Section 2
Override prevalence from contingency table	Also fill Prevalence in Section 2
Get 95% CIs for Sens/Spec/PPV/NPV	Use Section 1 (cell counts required)
Activate clinical decision support	Enter both Testing AND Treatment thresholds
Positive test → treat directly	Entire +ve test CI must be above treatment threshold
Negative test → discharge safely	Entire -ve test CI must be below testing threshold
Both results → investigate further	Either CI spans its threshold
Export meter image	Click "Save Meter as PNG" (left button)
Export full PDF report	Click "Export PDF Report" (right button)
Copy citation	Scroll to bottom → "How to cite this page" → Copy citation
View references	Click "References" accordion at the bottom of the page
Feedback / usage counter	Scroll below the export buttons

contact@trustresearch.org | trustresearch.org | +201119678899
Facebook: trust.research.center | Instagram: trustresearch2017 | X: trust_research